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División de Nuevas Creaciones

SOLICITUD

PATENTE DE MODELO DE UTILIDAD

21 EXPEDIENTE No

04-206132

54 TITULO

SISTEMA DE VELAS TEMPORIZADAS CON SONIDO Y OPERADO

CON MONEDAS Y METODO DE FABRICACION DE LA VELA

51 CLASIFICACION INTERNACIONAL

71 SOLICITANTE

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Carera 2 A No 55 A - 10 Los Centauros - Bucaramanga.

74 APODERADO

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PETITORIO


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FORMULARIO ÚNICO DE SOLICITUD DE PATENTE PCT ENTRADA EN FASE NACIONAL

①

SOLICITUD DE:

☐ Patente de Invención.

☒ Patente de Modelo de Utilidad.

☒ Capítulo I.

☐ Capítulo II.

②
SOLICITANTE
(71)

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IDENTIFICACIÓN

C.C. ☒ NT ☐
C.E. ☐ Otro ☐
Cual _____
Número 91.233.509

③
REPRESENTANTE
O APODERADO

Nombre:
Dirección:
Teléfono: Fax:
E-mail:

IDENTIFICACIÓN

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C.E. ☐ Otro ☐
Cual _____
Número _____ TP _____

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(72)

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⑤ PCT (86)

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⑥ Título (54) SISTEMA DE VELAS TEMPORIZADAS, CON SONIDO Y OPERADO CON
MONEDAS. Y METODO DE FABRICACION DE LA VELA.

⑦ Clasificación Internacional (51)

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⑧ Prioridad

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Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página.

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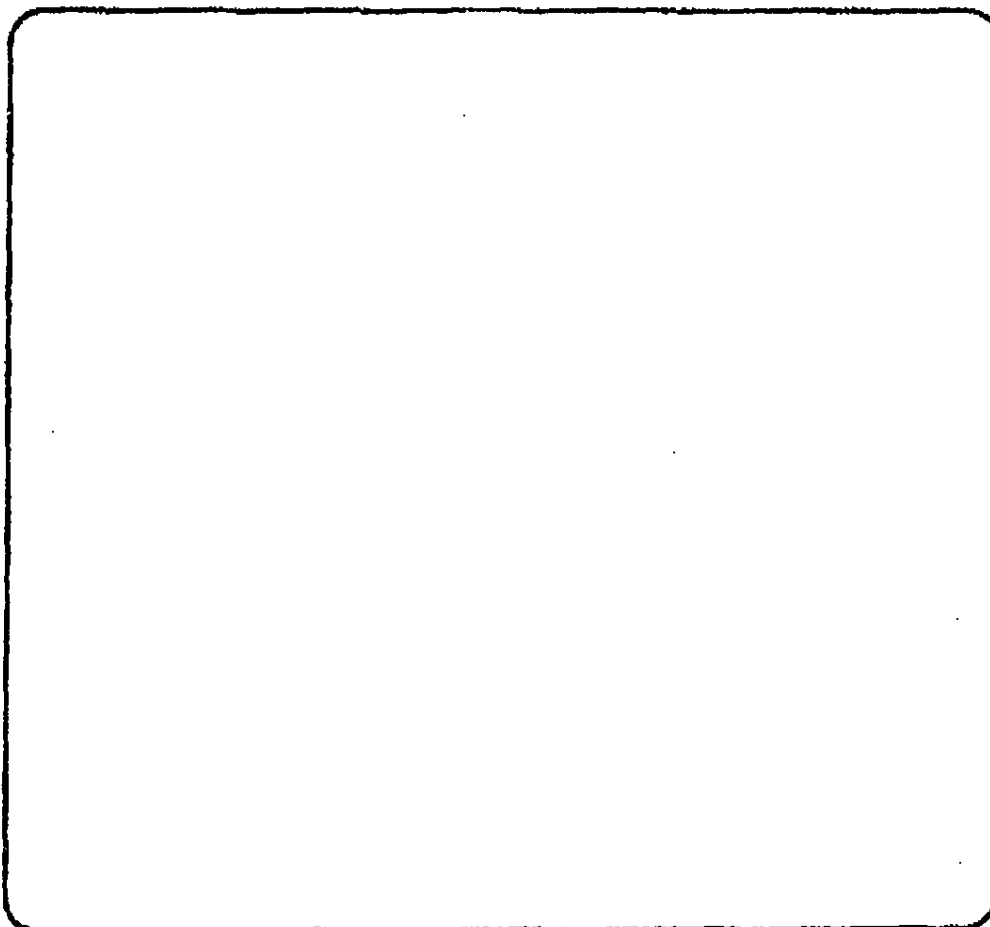
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ANEXOS

2

- ☒ Comprobante de pago de la tasa de presentación de la solicitud.
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☐ Poderes, si fuere el caso.
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones.
- ☐ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen Preliminar (IPEA).
- ☐ Traducción del examen preliminar internacional efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☒ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☐ De ser el caso, modificaciones efectuadas a la solicitud internacional.
- ☒ Otros - Copia informe de búsqueda internacional.
- ☐ - Carta

11 FIGURA CARACTERÍSTICA:



12 Solicito la concesión de la patente Modelo de Utilidad y declaro que la invención es nueva y de mi propiedad.

NOMBRE: José Joaquín Uribe Sauza

FIRMA:

C.C. 91.233.509 T.P.

Instrucciones para la presentación de los anexos, ver reverso de esta página.

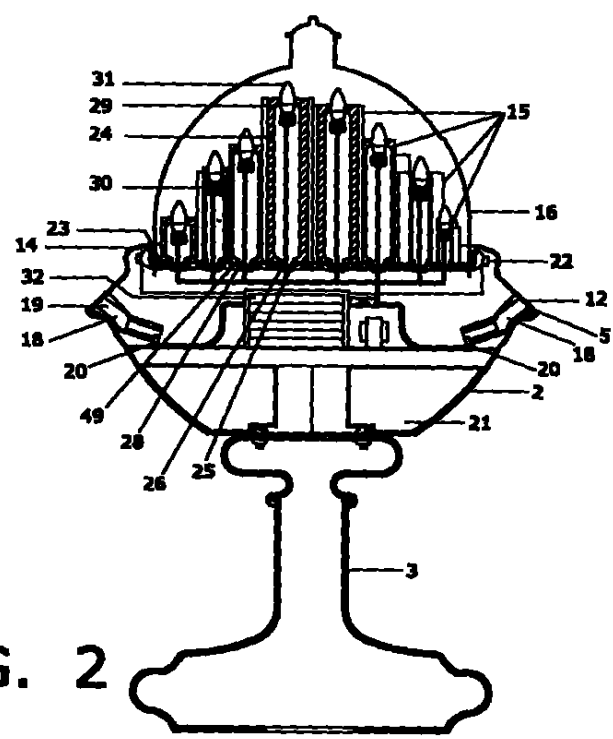


FIG. 2

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FECHA : AGOSTO 19 DE 2004

CONSIGNACION

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Gr. PAGO
JOSE JOAQUIN URIBE S.	CONSIGNACION	BANCO POPULAR	050-00110-4	28360058	12/08/2004	240.000.00

CONCEPTO

CANT. CONTABILITICO	CONCEPTO	TOTAL CONCEPTO
1 50005-01-01 SOLICITUDES	5 TRAMITES DE SOL. DE MODELO DE UTI	240.000.00
	TOTAL :	240.000.00

SOM: DOSCIENTOS CUARENTA Y OCHO MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

5

Bucaramanga, 12 de Agosto de 2.004

Señores
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
Delegatura para la propiedad Industrial
División de Nuevas Creaciones
Santa Fe de Bogotá

Solicitud Internacional: PCT/IB02/02077
Referencia Solicitante: JOJO16642802

Yo, José Joaquín Uribe Sauza con cédula de ciudadanía número 91.233.509 de Bucaramanga formalmente ante Ustedes estoy dando entrada a la fase nacional de la solicitud Internacional de la referencia presentada ante la WIPO-OMPI el 04 de Abril de 2.002, para que se me conceda la patente de modelo de Utilidad de la misma o la de invención si considera en esta categoría.

Estoy adjuntando copia del informe de búsqueda internacional.

Mi nueva dirección es Carrera 2A No. 55A – 10 Los Centauros Bucaramanga. Tel: 6590626.

Mi correo electrónico sigue siendo el mismo: josesauza@cpm.net.co

Cordialmente,



José Joaquín Uribe Sauza
C.C. 91.233.509 de Bucaramanga.

SISTEMA DE VELAS TEMPORIZADAS, CON SONIDO Y OPERADO CON MONEDAS. Y METODO DE FABRICACIÓN DE LA VELA.

sector técnico

La solicitud se refiere, a un sistema de velas temporizadas que emite sonidos en forma de mensajes y es operado con monedas. También se refiere a la forma de operación del mismo. Adicionalmente al método de fabricación de la vela en parafina con lámpara eléctrica para el sistema a partir de un molde con arreglos de recipientes plásticos dentro del mismo. Su uso se da en iglesias y casas de oración.

técnica anterior

Los sistemas de velas eléctricos actuales operados con monedas ubicados en las iglesias y casas de oración, están constituidos básicamente por un gabinete rectangular o cuadrado en forma de gradas soportando un grupo de velas eléctricas de pantallas plásticas de un solo tamaño, ordenadas en filas y columnas, manteniendo todas una matriz cuadrada o rectangular. Ejemplo: 10 filas de velas por 5 columnas de velas total 50 velas, cada fila de velas está protegida por un caparazón acrílico rectangular, para el ejemplo un total de 5 caparazones porque son 5 filas. Por la forma como está concebido el gabinete y por la configuración que tienen las velas solo se permite acceder a él frontalmente solo por un lado. Las ranuras para el depósito de monedas están ordenadas en una matriz de filas y columnas, manteniendo una relación constante las ranuras y las velas de 1 a 1, Su forma de operación está dada solo por una función para el depósito de una moneda por una y exclusivamente solo una ranura ubicada al frente de la vela encendiéndose la vela solo por un periodo de tiempo determinado, no teniendo otras funciones de operación del sistema, por ejemplo: prolongar el periodo de encendido de la vela a la cantidad de entradas de monedas por una ranura, o encender varias velas al depósito de varias monedas por una misma ranura de entrada de monedas, o la emisión de sonido (voz o música) en forma de mensajes.

En la patente de Estados Unidos 4.228.885 divulga una lámpara eléctrica operada con moneda que se enciende al depósito de una moneda por una ranura que se encuentra al frente de la misma y que hace accionar un switch para cerrar el circuito del bombillo incandescente y del motor en paralelo a la lámpara. El motor maneja una espiral la cual en completa rotación pulsa el switch en una posición abierta para parar el motor y apagar la luz del bombillo.

Convencionalmente la vela de estos sistemas se compone de una pantalla o tubo plástico en forma cilíndrica, hueco por dentro con una lámpara eléctrica en el centro, el cual para sostenerse vertical en el gabinete, utiliza en ocasiones ángulos con tornillos o ganchos, remaches, magnetos o goma de pegar.

De otro lado existe una necesidad continuada de recuperación de materiales plásticos de desecho (recipientes) debido al gran volumen y contaminación que generan. En algunos países un impuesto de desecho se exige sobre el volumen de material que se desecha en la basura.

divulgación de la invención

La invención comprende un sistema conformado por un gabinete de forma semiesférica sostenido sobre una base que toma esa forma cuando el conjunto de velas es

SISTEMA DE VELAS TEMPORIZADAS, CON EMISIÓN DE SONIDO Y OPERADO CON MONEDAS. Y METODO DE FABRICACIÓN DE LA VELA.

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divulgación de la invención

La invención comprende un sistema conformado por un gabinete de forma semiesférica sostenido sobre una base que toma esa forma cuando el conjunto de velas es

igual o mayor a dos hasta nueve grupos. Y toma la forma de media semiesfera o un cuarto de semiesfera sin base de soporte cuando el conjunto de las velas es igual a un grupo.

Ejemplo: Cuando el conjunto de las velas está conformado por tres grupos de 15 velas para un total de 45 velas, el gabinete toma la forma semiesférica; lo mismo sería para 4 grupos de

5 15 velas para un total de 60 velas, etc.

Pero cuando el conjunto de velas está conformado por un grupo de 24 velas, el gabinete puede tomar la forma de media semiesfera o un cuarto de media semiesfera; lo mismo sería para un grupo de 15 velas, etc.

10 El gabinete de forma semiesférica soporta en su parte superior lateral externa una serie de laminillas formando entre sí una circunferencia, con una figura en su interior que la identifica al momento de hacer el encendido de las velas y que corresponde a otra igual ubicada en las mismas, manteniendo una relación directa de 1 a 1 laminillas del gabinete con respecto a las laminillas de las velas.

15 También se encuentra una serie de ranuras de acceso para la entrada de monedas formando entre sí una circunferencia, configuradas de tal manera con las laminillas del gabinete, que por cada cantidad de laminillas hay una o varias ranuras para entrada de monedas, que mantiene una relación en cantidad de separación de laminillas con respecto a las ranuras de acceso de m a n ranuras de acceso, donde m laminillas es un entero de 1 hasta 5 y n ranuras de acceso es un entero de 0 hasta 3.

20 Ejemplo: Cuando m laminillas es igual a 3 y n ranuras de acceso igual a 1, la configuración queda de tal manera que por cada 3 laminillas para identificación de cada una de las velas ubicadas en el gabinete hay una ranura de acceso para entrada de monedas.

25 En cada una de las laminillas ubicadas en el gabinete se encuentra un sensor al tacto ubicado en la parte inferior de las mismas para ser activado con el dedo al contacto con el mismo, previo depósito de una o varias monedas por cualquiera de las ranuras de acceso de un determinado grupo de velas.

30 En la parte media interna del gabinete se soporta un conjunto de selectores de monedas que utiliza una rampa conformada por dos planos inclinados para regular el recorrido de la moneda y permitir el control de la velocidad de caída por gravedad de la misma y hacer la selección por el diámetro predeterminado de la misma. El selector se ajusta al diámetro de cualquier moneda. Para predeterminar la selección de la moneda por el diámetro solo basta colocar una moneda de referencia en el selector que sostiene una pieza corrediza del mismo y hacer el desplazamiento un milímetro mas abajo de la altura de la moneda, enseguida se ajustan unos tornillos que sostienen la pieza.

35 El selector de monedas por la parte alta se comunica al exterior del gabinete por una ranura de acceso que es la entrada de monedas y por la parte baja en la salida soporta un sensor opto acoplador infrarrojo, compuesto de un elemento transmisor y uno receptor colocados de tal manera que el rayo infrarrojo sea obturado por el paso de una o varias monedas y así verificar la entrada de la moneda.

40 En el caso de presentarse una avería en cualquiera de las ranuras de acceso de entrada de

monedas en la selección de encendido de una o varias velas, solo quedaría fuera de servicio esa ranura de acceso, teniendo la posibilidad de encender las mismas velas seleccionadas al depósito por otras ranuras de acceso.

En la parte baja interna del gabinete se alojan unas alcancías para el depósito de las monedas.

En su parte superior el gabinete de forma semiesférica soporta una plataforma circular donde se sostiene un conjunto de velas. Las velas se configuran en uno o varios grupos iguales dispuestos cada uno por un número determinado de velas, la configuración está dada por $p \cdot q$ velas, donde p es el número de grupos y q el número de velas, y donde p es un entero de 1 hasta 9 y q es un entero múltiplo de 3; desde 3 hasta 84.

Las velas están dispuestas desde el centro de la plataforma ubicada en el gabinete hacia afuera, de mayor a menor; en diferentes tamaños, formas y grosores identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, dando entre sí la apariencia de un cono truncado.

Todo el conjunto de velas está protegido por un domo semiesférico.

Por la configuración que tienen las ranuras y laminillas en el gabinete formando una circunferencia y por la configuración y disposición de las velas en varios grupos, tamaños y formas dando la apariencia de un cono truncado, permite que varias personas accedan a él simultáneamente por cualquiera de sus lados (los 360 grados) y tengan la posibilidad de operar el sistema de velas bajo varias modalidades de encendido, sin que se presenten interferencias entre ellas.

Otra forma de configuración de las velas puede estar dada para varios grupos de velas, dispuestas desde el centro de la plataforma del gabinete de forma semiesférica con base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una forma y grosor, identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde todas dan la apariencia de un cono truncado. Todo el conjunto de velas está protegido por un domo semiesférico.

Otra forma de configuración de las velas puede estar dada para un grupo de velas, dispuestas desde el borde interno central de la plataforma del gabinete de forma media semiesfera y sin base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una o varias formas y grosores, identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde todas dan entre sí la apariencia de medio cono truncado, protegidas por un domo.

Otra forma de configuración de las velas puede estar dada para un grupo de velas, dispuestas desde el borde interno de la plataforma del gabinete de forma media semiesfera y sin base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una o varias formas y grosores identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde

todas dan la apariencia de una cascada, protegidas por un domo.

Otra forma de configuración de las velas puede estar dada para un grupo de velas, dispuestas desde la unión de los dos bordes internos de la plataforma del gabinete de forma un cuarto de semiesfera y sin base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una o varias formas y grosores identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde todas dan la apariencia de un cuarto de cono truncado, protegidas por un domo.

El gabinete en la parte superior interna aloja un altavoz por cada grupo de velas disponibles para la emisión de sonido (voz o música) en forma de mensajes.

Independientemente de la forma de operación de encendido que ejecute la persona, solo sonará un altavoz en un momento determinado, jamás sonarán todos al mismo tiempo.

Las distintas partes del sistema de velas como sensores al tacto ubicado en las laminillas para selección de las velas, sensores opto acopladores infrarrojos en las salidas de los selectores de monedas para detectar la entrada de cada una de ellas, lámparas en cada una de las velas para encendido y temporización de las mismas, altavoces para la emisión de sonido (voz y/o música) en forma de mensajes, están interconectados para su funcionamiento con un dispositivo de control, por ejemplo: electrónico programable.

Sobre la base de las siguientes descripciones de funcionamiento tal control es fácilmente imaginable para los expertos en la materia y por lo tanto no se representa en adelante, se hace sobre la base de las siguientes descripciones de funciones:

Primera:

Para el encendido de una vela temporizada en un periodo de tiempo, depositando una moneda por una ranura de acceso y dando emisión de sonido (voz y/o música) en forma de mensajes.

Se deposita una moneda por una ranura de acceso y se selecciona una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto con un dedo en el sensor al tacto ubicado en ella; se enciende la vela por un periodo de tiempo determinado, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes por unos segundos.

Segunda:

Para el encendido de una vela temporizada en uno o varios periodos, depositando una o varias monedas por una ranura de acceso y a su vez dando una emisión de sonido cuando la configuración de las laminillas con respecto a las ranuras es de 1 a 1.

Se deposita una moneda por una ranura de acceso correspondiente a la laminilla de la vela deseada, se enciende la vela a su vez se da una emisión de sonido (Voz y/o música) en forma de mensajes por unos segundos. Para acumular periodos de temporización de encendido de la vela es preciso depositar x número de monedas por la ranura correspondiente a la laminilla y hacer contacto en el sensor al tacto tantas veces como monedas se hayan depositado, dándose a su vez una secuencia de sonidos (voz y/o música) en forma de mensajes.

Tercera:

Para el encendido de una vela temporizada en varios periodos de tiempo, depositando monedas por una o varias ranuras de acceso de entrada de monedas y dando una emisión de sonido (voz y/o música) en forma de mensajes.

5 Se depositan varias monedas por una o varias ranuras de acceso y se selecciona una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto varias veces en el sensor al tacto ubicado en ella, igual al número de monedas depositadas, se enciende la vela deseada manteniéndose encendida por varios periodos de tiempo iguales al número de veces de contactos realizados en el sensor al tacto, a su vez se da una secuencia de emisiones de sonidos (voz y/o música) en forma de mensajes por unos segundos, iguales al número de
10 veces de contactos realizados con el dedo en el sensor al tacto en la laminilla.

Ejemplo: Si cada periodo de tiempo de encendido de la vela del sistema se ha programado para que se mantenga encendida 3 minutos y se han depositado 4 monedas por una o varias ranuras de acceso y se ha realizado 4 veces contacto en un sensor al tacto en una laminilla correspondiente a una vela deseada. Se enciende la vela deseada manteniéndose encendida
15 por 12 minutos a su vez se da la emisión de sonido (4 mensajes secuenciales de voz y/o música). Cada mensaje se reproduce aproximadamente en un tiempo de 7 s. para un tiempo total de emisión de sonido de 28 s. aproximadamente.

Cuarta:

20 Para el encendido de varias velas temporizadas en un periodo de tiempo, depositando monedas por una ranura de acceso y dando emisión de sonido (voz o música) en forma de mensajes.

Se depositan varias monedas por una ranura de acceso se seleccionan varias laminillas en el gabinete correspondientes a las velas deseadas e igual al número de monedas depositadas y se hace contacto en cada una de ellas en el sensor al tacto una sola vez. Se encienden las
25 velas seleccionadas y se da a su vez varias emisiones de sonido (voz y/o música) en forma de mensajes por unos segundos iguales en número de veces a los contactos realizados con el dedo en los sensores al tacto ubicados en cada laminilla.

Quinta:

30 Para el encendido de varias velas temporizadas en uno o varios periodos de tiempo, depositando monedas por varias ranuras de acceso de entradas de monedas y dando emisión de sonido (voz y/o música) en forma de mensajes.

Se depositan monedas por varias ranuras deseadas se seleccionan varias laminillas correspondientes a las velas deseadas haciendo contacto en el sensor al tacto en cada una de ellas igual al número de monedas depositadas, se encienden las velas seleccionadas
35 manteniéndose encendidas cada una por uno o varios periodos de tiempo determinado, a su vez se da una secuencia de emisiones de sonido (voz y/o música) en forma de mensajes iguales al número de contactos realizados con el dedo en el sensor al tacto en cada una de las laminillas.

Sexta:

40 Cuando todas las velas se encuentran encendidas y no hay emisión de sonido, en el

momento de acceder al encendido de mas velas.

Se podrá actuar en cualquiera de las funciones anteriores, la diferencia radica en que se acumularán mas periodos de temporización, manteniendo encendidas la o las velas por mas tiempo, a su vez se da la emisión de sonido (voz y/o música) en forma de mensajes inmediatamente, uno detrás del otro.

Séptima:

Cuando hay emisión de sonido en el momento de acceder al encendido de mas velas.

Se podrá actuar en cualquiera de las funciones anteriores, la diferencia radica en que la emisión de sonido(voz y/o música) en forma de mensajes se acumulará llevándose a una cola de espera para luego ser emitidas secuencialmente.

Octava:

Si se alcanza una condición igual o mayor de periodos de tiempo de encendido acumulados en una vela haciendo contacto en un sensor al tacto en una laminilla del gabinete hasta alcanzar un tope mínimo predeterminado dando a su vez una emisión de sonido prolongada (voz y/o música) en forma de mensajes.

Se deposita una cantidad mínima de monedas por una o varias ranuras de acceso, se selecciona una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto con un dedo en el sensor al tacto ubicado en ella, tantas veces como monedas se hayan depositado y alcanzando una condición igual o mayor predeterminada en el sistema, se enciende la vela seleccionada por varios periodos de tiempo y se da una emisión de sonido por varios segundos; una serie de mensajes predeterminados en forma secuencial.

Ejemplo: Si cada periodo de encendido de la vela dura tres minutos, y se ha predeterminado mínimo 6 monedas para escuchar una oración. Se depositan seis monedas mínimo por una o varias ranuras de acceso, se selecciona una laminilla en el gabinete correspondiente a la vela deseada y se hace contacto con un dedo seis veces en el sensor al tacto ubicado en ella se enciende la vela seleccionada manteniéndose encendida por dieciocho minutos a su vez se da la emisión de sonido, una oración que se reproduce por un periodo de tiempo aproximado de 30 s.

Novena:

Ajuste del periodo de temporización de la vela presionando un suiche en el gabinete. El sistema permite ajustar el periodo base de tiempo de encendido de la vela, accionando un switch o pulsador dentro del gabinete, correspondiente a distintos valores predeterminados de incremento de periodos de temporización.

Ejemplo: Si la vela se programa para que se mantenga encendida por cuatro minutos y si se determina un incremento de dos minutos, se presiona el switch o pulsador ubicado dentro del gabinete en la posición predeterminada a un incremento de dos minutos, quedando el periodo base de temporización de encendido de la vela para seis minutos.

Décima :

Acumulado o cambio de nuevos mensajes para el sistema de velas vía internet.

Cuando se desee el acumulado o cambio de nuevos mensajes para el sistema de velas, el

sistema se comunicará a la red mundial (internet) accediendo a una dirección correspondiente a una página web donde se ofrecerá el servicio de cambio o adición de uno o varios mensajes en particular.

Décima Primera:

- 5 Diagnóstico de operación del sistema de velas accionando un switch en el mismo o a través de la web.
- En el sistema de velas se encuentra un switch para accionarlo a una de sus dos posiciones la cual estaría determinada para que realice un monitoreo general a todo el sistema y permita hacer un diagnóstico de operación del sistema y reportar cualquier avería de cualquiera de
- 10 las distintas partes componentes del sistema que están interconectadas para su funcionamiento. El diagnóstico se podrá hacer a través de la web conectándose por medio de un puerto de entrada /salida ubicado en el sistema.
- La divulgación también está dirigida hacia el método de fabricación de la vela para el sistema de velas temporizadas, con emisión de sonido y operado con monedas; el cual
- 15 comprende un molde compuesto de una pared lateral sustancialmente circular cerrado en el extremo inferior por la base. La base tiene una porción de cuerpo que se soporta sobre una superficie plana. Extendiéndose desde la base se encuentra una pared de transición que termina en la pared de soporte; que sirve para sostener por la parte interna de la misma un recipiente plástico sostenido a su vez por la base del mismo. La pared de transición que se
- 20 extiende hacia arriba tiene una profundidad de por lo menos la longitud de una lámpara eléctrica. En el otro extremo superior de la pared del molde para la vela está la abertura del mismo por donde se introduce un arreglo de recipientes plásticos reciclados. El cuerpo del molde en su contorno puede tomar la forma cuadrada, esférica, piramidal o de cono truncado.
- 25 La disposición o arreglos de recipientes dentro del molde puede estar dado por la ubicación de un recipiente mas pequeño al tamaño del molde, de tal manera que la base del mismo quede hacia abajo sobre la pared de soporte interna del molde, que sirve posteriormente después de desmoldada para soportar la lámpara eléctrica; y el pico de vertido con sus roscas para sostener el cuerpo de la vela sobre la plataforma del gabinete.
- 30 También se pueden alojar dos recipientes plásticos reciclados en el interior del molde unidos por sus dos bases (esta forma de arreglo se da cuando la pared de transición que sostiene la pared de soporte no es lo suficientemente alta como para alojar el pico de vertido de otro envase) quedando un pico de vertido con sus roscas y tapa hacia la parte alta del molde para de allí posteriormente asegurarlo a la plataforma del gabinete. O pueden ubicarse en el
- 35 interior del molde dos o mas recipientes en arreglo de apilado llevando el pico de vertido de un primer recipiente a hacer contacto con la base de un segundo recipiente, quedando siempre un pico de vertido hacia arriba en el molde. Esta posición de los envases dentro del molde se da cuando se requiere de velas de poco grosor y altos tamaños. Otra forma de arreglo de los recipientes dentro del molde puede darse para tres recipientes plásticos
- 40 reciclados unidos por sus lados, quedando las bases hacia abajo y los picos de vertido con

sus roscas hacia la parte alta del molde. Esta posición de los envases dentro del molde se da cuando se requiere de velas de alto grosor y baja altura.

Para la fabricación de la vela del sistema se procede de la siguiente manera:

Se aplica desmoldante en la parte interna de un molde de tamaño, forma y grosor de la vela deseada, se ubica en el interior del molde un arreglo de recipientes plásticos reciclados construido de un material de alta resistencia a la tensión preferible los fabricados en tereftalato de polietileno (PET) con un refrigerante en su interior. El siguiente paso es colocar parafina en un recipiente, se introduce dentro de una vasija y se lleva a baño de María, se calienta hasta que la parafina se funde. Se agrega el tinte deseado. Cuando la parafina alcance aproximadamente 343 grados Kelvin volcarla en el molde que contiene el recipiente plástico hasta alcanzar el reborde de proyección circundante ubicado debajo de la rosca del recipiente, se deja solidificar y enfriar, finalmente desmoldar. Luego se adorna igual a las velas de parafina con pabilo, es decir con celofán, pintura, etc., incluyéndole todos los rasgos ventajosos de la vela tradicional pero que es estructuralmente mejorado para hacerla mas liviana y fácil de instalar.

Enseguida se abre un orificio en el centro de la pared de soporte del recipiente que quedó ubicado dentro del cuerpo de la vela de parafina, para que de allí se sostenga la lámpara eléctrica; la arandela resultado de esta operación se ubica en el interior de un zócalo, se le abre un pequeño orificio en el centro y por allí se hace pasar un remache para que sea un electrodo de la lámpara que se ajusta en él, se hace la conexión eléctrica soldando los cables al zócalo y sacándolo por el pico de vertido del recipiente que queda en la parte baja del cuerpo de la vela de parafina.

En la plataforma circular que se ubica en la parte superior del gabinete hay una serie de orificios al ancho del pico de vertido de cada recipiente; la forma de instalar las velas allí es: Ubicar un orificio por encima de la plataforma del gabinete que corresponde a una vela predeterminada, se monta la vela quedando el cuerpo de la misma y el reborde de proyección circundante sobre la plataforma y el pico de vertido con las roscas traspasando el orificio. Por debajo se coloca una arandela dentro de las roscas construida de la base de otro recipiente, enseguida se asegura la vela haciendo el cierre con la tapa contra las roscas del pico de vertido del recipiente. En la parte superior de la vela se coloca una laminilla que contiene una figura y que corresponde a otra igual ubicada en el gabinete.

BREVE DESCRIPCIÓN DE LOS DIBUJOS

Fig.1 es una vista en perspectiva del sistema de velas.

Fig. 1 A es una vista en detalle del sistema de velas de la Fig. 1.

Fig. 2 es una vista en corte del sistema de velas representado en la Fig.1

Fig. 3 es una vista en planta donde se ve la configuración de las velas representada en la Fig.1.

Fig. 4 es una vista en planta de otra forma de configuración de las velas.

Fig. 4 A es una vista en alzado de la configuración de las velas representada en la Fig.4 donde todas dan la apariencia de un cono truncado ubicadas en un gabinete de apariencia

forma semiesférica.

Fig. 5 es una vista en planta de otra forma de configuración de las velas ubicadas en un gabinete de forma media semiesfera.

5 Fig. 5 A es una vista en alzado de la configuración de las velas representada en la Fig. 5 donde todas dan la apariencia de un cono truncado y el gabinete sin base de soporte.

Fig. 6 es una vista en planta de otra forma de configuración de las velas ubicadas en un gabinete de forma media semiesfera.

Fig. 6 A es una vista en alzado de la configuración de las velas representada en la Fig. 6 donde todas dan la apariencia de un cono truncado y el gabinete sin base de soporte.

10 Fig. 6 B es una vista en alzado de la configuración de las velas representadas en la Fig. 6 donde todas dan la apariencia de una cascada y el gabinete sin base de soporte.

Fig. 7 es una vista en planta de otra forma de configuración de las velas ubicadas en un gabinete de forma un cuarto de semiesfera.

Fig. 8 es una vista en corte del molde de la vela, alojando un recipiente plástico.

15 Fig. 9 es una vista en corte de la vela de parafina para el sistema.

Fig. 10 es una vista en despiece de la vela, representada en la Fig. 9

Fig. 11 es una vista en corte de un arreglo de dos recipientes plásticos alojados en la vela de parafina para el sistema.

DESCRIPCIÓN DE LA INVENCION CON RESPECTO A LAS FIGURAS

20 Tal como se anotó la invención está dirigida hacia un sistema de velas temporizadas con emisión de sonido, operado con monedas; a la forma de operación del mismo, como también al método de fabricación de la vela para el sistema. Este sistema se describe en más detalle con referencia a los dibujos. En la Fig. 1 Se representa el sistema de velas 1 el cual está conformado por un gabinete semiesférico 2 sostenido sobre una base 3, toma esa forma
25 cuando el conjunto de velas 4 es igual o mayor a dos hasta nueve grupos; dicho gabinete 2 soporta en su parte media lateral externa 5 una serie de laminillas 6 que forman entre sí una circunferencia, cada laminilla 7 ubicada en el gabinete 2 contiene una figura que corresponde a otra igual 8 ubicada en cada vela 9, las cuales se identifican entre sí cuando se va a hacer la selección de encendido de las mismas, manteniendo una relación directa de 1 a
30 1 laminillas. En cada laminilla 7 ubicada en el gabinete 2 hay un sensor al tacto 10 ubicado en su parte inferior y se activa al depositar una o varias monedas 11 por una ranura de acceso 12 y al hacer contacto con un dedo 13 en cada una de ellas.

Al lado inferior de las laminillas 6 ubicadas en el gabinete 2 se encuentra una serie de ranuras 12 para entrada de monedas formando entre sí una circunferencia, configuradas de
35 tal manera las laminillas del gabinete 6 con respecto a las ranuras de acceso 12 que mantienen una relación de m a n ranuras.

En la parte superior 14 el gabinete 2 soporta una plataforma donde se sostiene el conjunto de velas 4 configuradas en varios grupos dispuestas desde el centro de la plataforma hacia afuera de mayor a menor 15 en varios tamaños formas y grosóres. Todo el conjunto de velas
40 4 da la apariencia de un cono truncado y están protegidas por un domo semiesférico 16.

La Fig. 1 A muestra una vista en detalle del sistema de velas 1 temporizadas de la Fig.1 ilustra una forma de operación del mismo; una mano 17 operando el sistema de velas 1 mediante la introducción de una moneda 11 por una de las ranuras de acceso 12 que conduce a un selector de monedas y un dedo 13 haciendo el cierre en un sensor al tacto 10 al contacto con el mismo en una de las laminillas 7 del gabinete 2 que contiene una figura que la identifica al hacer el encendido de una vela 9 y que corresponde a otra igual 8 ubicada en las velas, encendiéndose la vela 9 y manteniéndose temporizada por un periodo determinado, a su vez se produce una emisión de sonido en forma de mensaje. La combinación de estos eventos se hace sobre la descripción de una función permitiendo así la operatividad del sistema.

En la Fig. 2 vista en corte, se puede observar el sistema de velas 1 en su parte interna, a la altura media 5 del gabinete 2 soporta un conjunto de selectores de monedas 18 para hacer la selección por el diámetro predeterminado de las mismas.

El selector por la parte alta 19 se comunica al exterior del gabinete 2 por una ranura 12 que es la entrada de monedas 11 y por la parte baja en la salida soporta un sensor opto acoplador infrarrojo 20 para verificar la entrada de la moneda 11. En la parte baja del gabinete se alojan unas alcancías 21 para el depósito de la moneda 11.

En la parte superior 14 interna el gabinete 2 aloja los altavoces 22 dispuestos para la emisión de sonido (Voz o música); uno para cada grupo de velas.

Se puede observar la plataforma 23 que sostiene el conjunto de velas dispuestas desde el centro de la plataforma en varios tamaños 15 formas y grosores; el cuerpo de las velas 9 alojan en su interior un recipiente plástico reciclado 24 y sostenido por el mismo, la rosca 25 traspasa un orificio 26 de la plataforma 23 del ancho de la misma, por debajo de la plataforma 23 en la rosca 25 se coloca una arandela plástica 49 construida de la base de otro recipiente 24, enseguida se asegura la vela 9 haciendo el cierre con la tapa 28 junto a la rosca 25 del recipiente 24 quedando así ajustada la vela 9 por el soporte del mismo. En la base 29 del recipiente 24 alojado en el cuerpo de la vela 9 hay un orificio 46 en el cual se soporta la lámpara eléctrica 31 dentro de un zócalo 30.

El conjunto de velas está protegido por un domo 16 en forma de cúpula y todo el gabinete 2 reposa sobre una base 3.

Las distintas partes del sistema de velas 1, sensores al tacto 10, sensores opto acopladores infrarrojos 20, lámparas eléctricas 31 en cada una de las velas 9, altavoces 22, están interconectados para su funcionamiento con un dispositivo de control 32, por ejemplo: electrónico programable.

Tal control es fácilmente imaginable por los expertos en la materia por lo tanto no se representa, se hace sobre la descripción de una función.

En la Fig.3 vista en planta del sistema de velas 1, muestra una configuración de las velas de la Fig.1 dispuestas desde el centro 33 de la plataforma 23 del gabinete 2 de mayor a menor 15 en varias formas y grosores; se observan alrededor de la plataforma 23 del gabinete 2 las laminillas 6 con sus sensores 10 en la parte inferior de las mismas y sus ranuras 12 de

entrada de monedas 11 formando entre sí una circunferencia, configuradas de tal manera que por m cantidad de laminillas 6 corresponde n ranuras de acceso 12 para entrada de monedas. Tal configuración está dada por una relación de m a n ranuras, donde m laminillas es un entero de 1 hasta 5 y n ranuras de acceso 12 es un entero de 0 hasta 3.

5 La Fig. 4 muestra la misma configuración de las velas de la Fig. 3 pero dispuestas desde el centro 33 de la plataforma 23 del gabinete 2 hacia afuera en varios tamaños 15 una forma y grosor; se observa al rededor de la plataforma 23 la configuración de las laminillas 6 con sus sensores 10 en la parte inferior y sus ranuras de entrada de monedas 12, formando una circunferencia. Y en la Fig. 4 A se observan las velas de la Fig. 4 dispuestas en varios
10 tamaños 15 una forma y grosor dando todas la apariencia de un cono truncado, así como también las laminillas 6 y ranuras de acceso 12 formando entre sí una circunferencia y el gabinete 2 sostenido sobre una base 3.

Otra forma de configuración de las velas se aprecia en la Fig. 5 y Fig. 5 A dispuestas en el gabinete 2 desde el borde interno central 34 de la plataforma 23, toma esa forma el gabinete
15 2 porque el conjunto de las velas está dado por un grupo de las mismas, y sin base 2 de soporte, hacia afuera de mayor a menor en diferentes tamaños 15, formas 35 y grosores identificada cada una para su encendido por una laminilla 8 ubicada en la vela 9 y el gabinete 2. Todas las velas dan la apariencia de medio cono truncado protegidas por un domo 16.

20 La Fig. 6 y la Fig. 6 A muestran otra forma de configuración de las velas dispuestas desde el borde interno central 34 de la plataforma del gabinete 2 de forma media semiesfera, toma esa forma el gabinete 2 porque el conjunto de las velas 4 está dado por un grupo de las mismas y sin base de soporte, hacia fuera de mayor a menor 15 en diferentes tamaños una forma y grosor dando entre sí la apariencia de un cono truncado.

25 La Fig. 6 B es la misma configuración anterior de velas solo que el conjunto de las velas dan entre sí la apariencia de una cascada.

En la Fig. 7 se observa otra forma de configuración de las velas dispuestas desde la unión de los dos bordes internos 48 de la plataforma 23 del gabinete 2 de forma un cuarto de semiesfera, toma esa forma el gabinete 2 porque el conjunto de velas está dado por un grupo
30 de las mismas y sin base de soporte hacia fuera de mayor a menor 15 en diferentes tamaños una forma y grosor dando entre si la apariencia de un cuarto de cono truncado.

La vela 9 para el sistema de velas 1 de cualquier configuración, se fabrica a partir de un molde 36. En la Fig. 8 se muestra el molde 36 compuesto de una pared lateral 37 circular o puede tomar la forma triangular, piramidal, cuadrada, rectangular o de cono truncado; según
35 la forma de la vela 9 deseada. El molde 36 está cerrado en un extremo por la base 38. La base 38 soporta el molde sobre una superficie plana. Extendiéndose desde la base 38 se encuentra una pared de transición 39 que termina en la pared de soporte 40 y que sirve para sostener por la parte interna de la misma un recipiente 24 plástico reciclado sostenido a su vez sobre su base 29.

40 El procedimiento a seguir para fabricar la vela en parafina con lámpara eléctrica 9 se da

alojando uno o varios recipientes plásticos 24 en el molde 36 en arreglos predeterminados según el tamaño o grosor de la vela 9 para la configuración del sistema 1, con un refrigerante en su interior, una forma de posición de los recipientes 24 dentro del molde 36 puede estar dado por la Fig. 8 un recipiente plástico 24 con la base 29 hacia abajo y la rosca 25 con el
5 cierre de su tapa 28 hacia arriba. Se aprecia en el extremo inferior central del molde una entrante 41 que sirve de soporte del recipiente plástico 24 y a su vez de cabida para la posterior ubicación de la lámpara eléctrica 31 de la vela 9. En un recipiente metálico se calienta parafina y cuando alcance una temperatura de 338 grados kelvin se riega sobre el molde 36 que contiene el recipiente plástico 24 alcanzando el tope máximo de vaciado que
10 está dado por el final del reborde de proyección circundante 42 ubicado debajo de la rosca 25 del recipiente 24 y que posteriormente sirve de soporte de la vela 9 junto con el cierre de la tapa 28 contra la plataforma 23. Se deja enfriar y desmoldar. Luego se adorna igual a las velas de parafina con pabilo.

En la Fig. 9 se aprecia el cuerpo de la vela en parafina 43 de la Fig. 8 desmoldado alojando
15 un recipiente 24 plástico ubicado de tal manera que la base 29 del recipiente 24 con un orificio 46 queda hacia arriba como soporte de la lámpara 31 que aloja el zócalo 30 de la misma y la rosca 25 queda hacia abajo como soporte de la vela 9 para asegurarla a través del cruce del mismo por un orificio 26 en la plataforma 23 y haciendo el cierre junto con una arandela plástica 49 y tapa del mismo 28 contra la rosca 25 del recipiente 24.

20 La Fig. 10 es un despiece total de la vela 9; se observa la tapa 28 con la arandela plástica 49 para asegurar la vela 9 a la plataforma 23.

El cuerpo 43 de la vela 9 construido en parafina o gel mantiene al exterior los rasgos de una vela tradicional pero que es estructuralmente mejorado para hacerla mas liviana.

El recipiente plástico 24 que utiliza el reborde de proyección circundante 42 junto a la rosca
25 25 como soporte del cuerpo de la vela 9, y la base 29 del mismo con un orificio 46 como soporte de la lámpara eléctrica 31 y del zócalo 30; ofrece la ventaja de ser muy fácil de instalar en la plataforma 23 del sistema de velas 1.

Un remache 44 que actúa como un electrodo de la lámpara eléctrica 31 incrustado por el orificio central 44 de una arandela plástica 27 resultado de la operación de abrir un orificio
30 46 en la base 29 del recipiente 24 para sostener la lámpara eléctrica 31.

Un zócalo 30 que aloja la arandela 27 anterior junto al remache 44, y una lámpara eléctrica 31 que se enciende y se mantiene temporizada dependiendo de las distintas formas de operación del sistema de velas 1.

Cuando se deseen velas de altos tamaños y poco grosor pueden alojarse en su interior dos
35 recipientes plásticos 47 unidos por sus dos bases 29 quedando un recipiente 24 con la rosca 25 hacia abajo para sujetar la vela 9 y el otro recipiente 24 con la rosca 25 y tapa 28 hacia arriba como soporte del zócalo 30 que contiene la lámpara eléctrica 31.

Pueden hacerse varias modificaciones a la presente divulgación pero aún dentro de los presentes conceptos todas estas modificaciones se consideran como dentro de la misma.

REIVINDICACIONES

Lo que se reivindica es:

1. Un sistema para el encendido de velas temporizadas, con emisión de sonido, operado con monedas caracterizado por un gabinete de forma semiesférica, dicho gabinete se sostiene sobre una base y aloja una configuración de laminillas que forman entre sí una circunferencia para identificación y selección de las velas y de ranuras de acceso para entrada de monedas, manteniendo una relación en cantidad de separación de laminillas con respecto a las ranuras, dichas laminillas mantienen también una relación con respecto a las velas, las laminillas del gabinete corresponden a otras iguales ubicadas en las velas, dichas velas se configuran por grupos, dichos grupos a su vez están conformados por un número determinado de velas dispuestas sobre una plataforma, dicha disposición de las velas está dada desde el centro de la plataforma del gabinete hacia afuera, de mayor a menor, en varios tamaños, una o varias formas y grosores identificadas para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete; todo el conjunto de velas se protege con un domo semiesférico y se aloja en una plataforma que sirve de soporte, dicho soporte para las velas está dado por la ubicación de uno o varios recipientes plásticos dentro de las velas, del cual el cierre con la tapa junto a la rosca del mismo sirve para sostener la vela en la plataforma y la base con un orificio para sostener la lámpara eléctrica.
2. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dicho gabinete puede tomar la forma de media semiesfera sin base de soporte.
3. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dicho gabinete puede tomar la forma de un cuarto de semiesfera sin base de soporte.
4. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dichas laminillas se configuran en series de separación con respecto a las ranuras de m a n ranuras que forman una circunferencia, donde m laminillas es un entero de 1 hasta 5 y n ranuras es un entero de 0 hasta 3.
5. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1,4, donde dichas laminillas ubicadas en el gabinete con respecto a las laminillas ubicadas en las velas mantienen una relación de 1 a 1.
6. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1,4,5 donde dichas laminillas ubicadas en el gabinete alojan en su parte inferior un sensor al tacto para ser activado con el dedo al contacto con el mismo.
7. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dichas velas configuradas está determinado por p cantidad de grupos, donde p es un número entero de 1 hasta 9.
8. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7, donde dichos grupos conformados por un número determinado de

velas está dado por q velas, donde q es un número entero múltiplo de 3; desde 3 hasta 84.

9. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7,8, donde dicha disposición de las velas puede estar dada desde el borde interno central de la plataforma del gabinete de forma media semiesfera, hacia fuera de mayor a menor en diferentes tamaños, una o varias formas y grosores, donde todas dan la apariencia de un cono truncado.

10. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7,8 donde dicha disposición de las velas puede estar dada desde el borde interno central de la plataforma del gabinete de forma media semiesfera, hacia fuera de mayor a menor en diferentes tamaños, una forma y grosor donde todas dan la apariencia de una cascada.

11. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7,8, donde dicha disposición de las velas puede estar dada desde la unión de los dos bordes internos de la plataforma del gabinete de forma un cuarto de semiesfera, hacia fuera de mayor a menor en diferentes tamaños, una o varias formas y grosores donde todas dan la apariencia de un cono truncado.

12. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1, donde dicho soporte de la vela en la plataforma está dado por la rosca del recipiente plástico incrustado en ella, atravesando un orificio en la misma y del cual el cierre con la tapa y una arandela plástica (producto de abrir un orificio en la base de otro recipiente) contra las roscas aseguran la posición de la misma.

13. Sistema de velas temporizadas, con emisión de sonido, operado con monedas caracterizado por su forma de operación dada por una serie de eventos, tales como depósito de monedas por una o varias ranuras receptoras; selección de una o varias velas haciendo contacto con un dedo en el sensor al tacto ubicado en las laminillas del gabinete; encendido o acumulado de periodos de temporización de una o varias velas; y emisión o acumulado de sonido (voz y/o música) en forma de mensajes, transmitidos de uno en uno en forma secuencial. La combinación de estos eventos se hace sobre la descripción de una función, dicha función permite la operatividad del sistema.

14. Sistema de velas temporizadas con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de una vela temporizada en un periodo de tiempo determinado depositando una moneda por una ranura de acceso de entrada de monedas, seleccionando una laminilla en el gabinete correspondiente a la vela deseada y haciendo contacto con un dedo en un sensor al tacto, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes.

15. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de una vela temporizada en uno o varios periodos cuando la configuración de las laminillas en el gabinete con respecto a las ranuras es de 1 a 1. Se deposita monedas por la ranura correspondiente a la laminilla de la vela deseada se enciende la vela y a su vez se da una emisión de sonido en forma de mensaje. El sensor en la

laminilla se utiliza para el acumulado de x periodos de temporización de encendido de la vela haciendo contacto en el mismo tantas veces como monedas se hayan depositado.

- 5 16. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de una vela temporizada en varios periodos de tiempo, depositando monedas por una o varias ranuras de acceso para la entrada de monedas, seleccionando una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto en un sensor al tacto, a su vez se da una emisión de sonido (voz o música) en forma de mensajes.
- 10 17. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el encendido de varias velas temporizadas en un periodo de tiempo, depositando monedas por una ranura de acceso de entradas de monedas, seleccionando varias laminillas en el gabinete correspondiente a las velas deseadas haciendo contacto en un sensor al tacto, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes.
- 15 18. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de varias velas temporizadas en varios periodos de tiempo, depositando monedas por varias ranuras de acceso de entrada de monedas, seleccionando varias laminillas en el gabinete correspondiente a las velas deseadas haciendo contacto en un sensor al tacto tantas veces
- 20 igual al número de monedas depositadas, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes.
- 25 19. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para cuando se alcanza una condición igual o mayor de periodos de tiempo acumulados en una vela, seleccionando una laminilla en el gabinete correspondiente a la vela deseada se hace contacto en un sensor al tacto tantas veces hasta alcanzar el tope mínimo predeterminado a su vez se da una emisión de sonido (Voz y/o música), una serie de mensajes predeterminados en forma secuencial.
- 30 20. Sistema de velas temporizadas, con emisión de sonido , operado con monedas de acuerdo a la reivindicación 13,14,15,16,17,18,19, donde dicha función está dada para cuando todas las velas del sistema se encuentran encendidas y no hay emisión de sonido, en el momento de asesar al sistema, donde se podrá actuar en cualquiera de las funciones anteriores, la diferencia está en que los periodos de encendidos de las velas se acumulan por mas tiempo, a su vez se da la emisión de sonido (Voz y/o música) en forma de mensajes, uno detrás del otro.
- 35 21. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13,14,15,16,17,18,19,20, donde dicha función está dada para cuando todas las velas del sistema se encuentran encendidas y hay emisión de sonido en el momento de acceder al sistema, donde se podrá actuar en cualquiera de las funciones anteriores, la diferencia está en que los periodos de encendido de las velas se acumularan por mas tiempo
- 40 lo mismo que los mensajes de sonido (Voz y/o música) llevándose a una cola de espera para

luego ser emitidos en forma secuencial.

22. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el ajuste del periodo de temporización de la vela presionando un switch de regulación correspondiente a distintos valores predeterminados de incremento de periodos de temporización.
23. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el acumulado o cambio de nuevos mensajes para el sistema de velas vía internet accediendo a una dirección correspondiente a la pagina web.
24. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el diagnóstico de operación del sistema accionando un switch que está determinado para ello o accediendo a una dirección de la web.
25. Sistema de velas temporizadas, con emisión de sonido, operado con monedas caracterizado por el método para la fabricación de la vela en parafina para el sistema, que comprende un molde que tiene una pared lateral sustancialmente circular cerrado en el extremo inferior de la base. La base tiene una porción de cuerpo que se soporta sobre una superficie plana. Extendiéndose desde la base se encuentra una pared de transición dicha pared de transición termina en la pared de soporte, que sirve para sostener por la parte interna de la misma uno o varios recipientes plásticos, dichos recipientes plásticos están colocados en arreglo, sostenido a su vez por la base del mismo permitiendo así obtener velas en todos los tamaños y grosores.
26. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25, donde dicha pared de transición interna del molde que se extiende hacia arriba tiene por lo menos la altura de una lámpara eléctrica.
27. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de un recipiente plástico quedando la rosca del mismo hacia fuera del molde y la base como soporte de la lámpara eléctrica.
28. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de dos recipientes unidos por sus dos bases quedando una rosca de los mismos hacia fuera del molde, y una base sobre la pared de soporte del molde.
29. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de varios recipientes plásticos unidos por sus caras quedando las roscas de los mismos hacia fuera del molde.
30. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de apilado quedando el pico de vertido de un primer recipiente haciendo contacto con la base de un segundo recipiente.

31. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde el procedimiento a seguir para fabricar la vela para el sistema es aplicar desmoldante en la parte interna de un molde de tamaño, forma y grosor de la vela deseada, y ubicar en el interior del molde un arreglo de recipientes previamente

5 determinados con un refrigerante en su interior.

El siguiente paso es colocar parafina en un recipiente, introducirla dentro de una vasija y llevarla a baño de María, calentar hasta que la parafina se funda. Agregar el tinte deseado. Cuando la parafina alcance aproximadamente 343 grados Kelvin volcarla en el molde que contiene el arreglo de recipientes plásticos hasta alcanzar la parte final del reborde de

10 proyección circundante de los mismos. Dejar solidificar y enfriar, finalmente desmoldar.

Enseguida se abre un orificio en el centro de la base del envase que quedó ubicado dentro de la parafina, la arandela resultado de esta operación se ubica en el interior de un zócalo, se le abre un pequeño orificio en el centro y por allí se hace pasar un remache para que sea un electrodo de la lámpara que se ajusta en él, se hace la conexión eléctrica soldando los cables

15 al zócalo y se saca por la rosca del recipiente en la parte baja del cuerpo de la vela de parafina.

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RESUMEN

Sistema de velas (1) temporizadas, provisto de un gabinete (2) subdividido en partes dependiendo de la configuración en grupos de un conjunto de velas dispuestas en una plataforma desde el centro de la misma hacia fuera, en diferentes tamaños (15) una o varias formas y grosores identificadas cada una para su encendido por una laminilla (7) que contiene una figura y que corresponde a otra igual (8) ubicada en el gabinete (2). También soporta una configuración de laminillas (6) y ranuras (12) de entrada de monedas predeterminada por una relación formando todas entre sí una circunferencia. Se caracteriza por la forma de operar el sistema dado por una serie de funciones que permiten encender las velas por medio de sensores al tacto (10) a su vez emitir sonido en forma de mensajes. El método utilizado para fabricar la vela (9) en parafina con lámpara (31) para el sistema (1) parte de un molde (36) que aloja un arreglo de recipientes plásticos en su interior.

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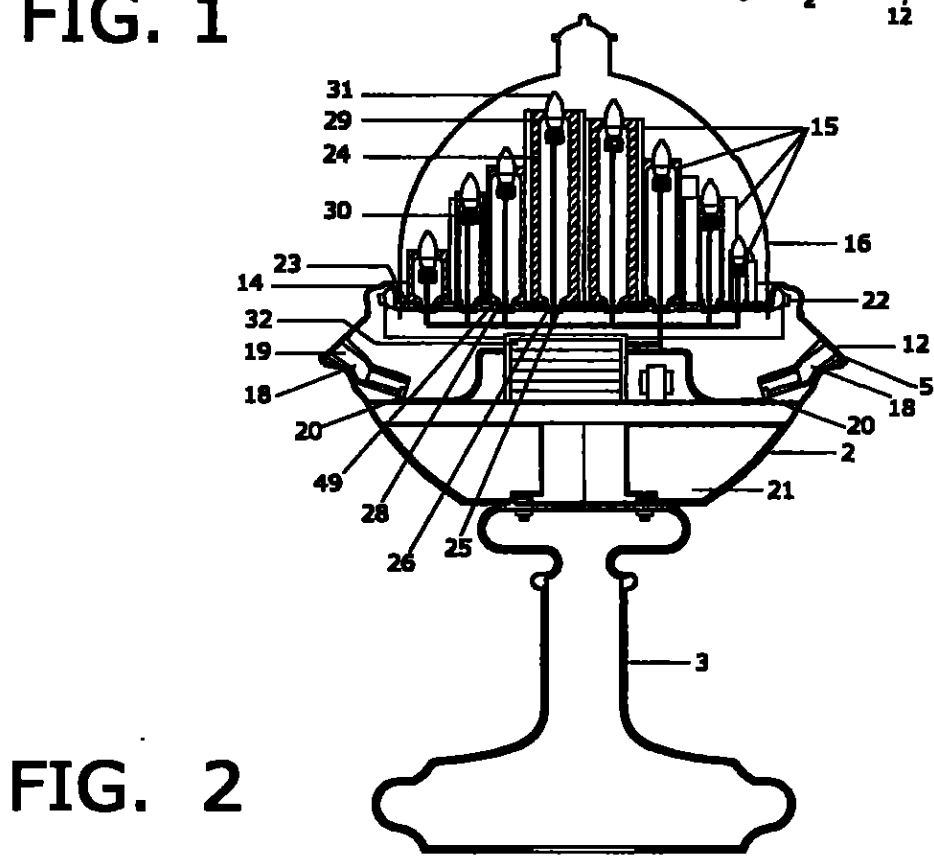
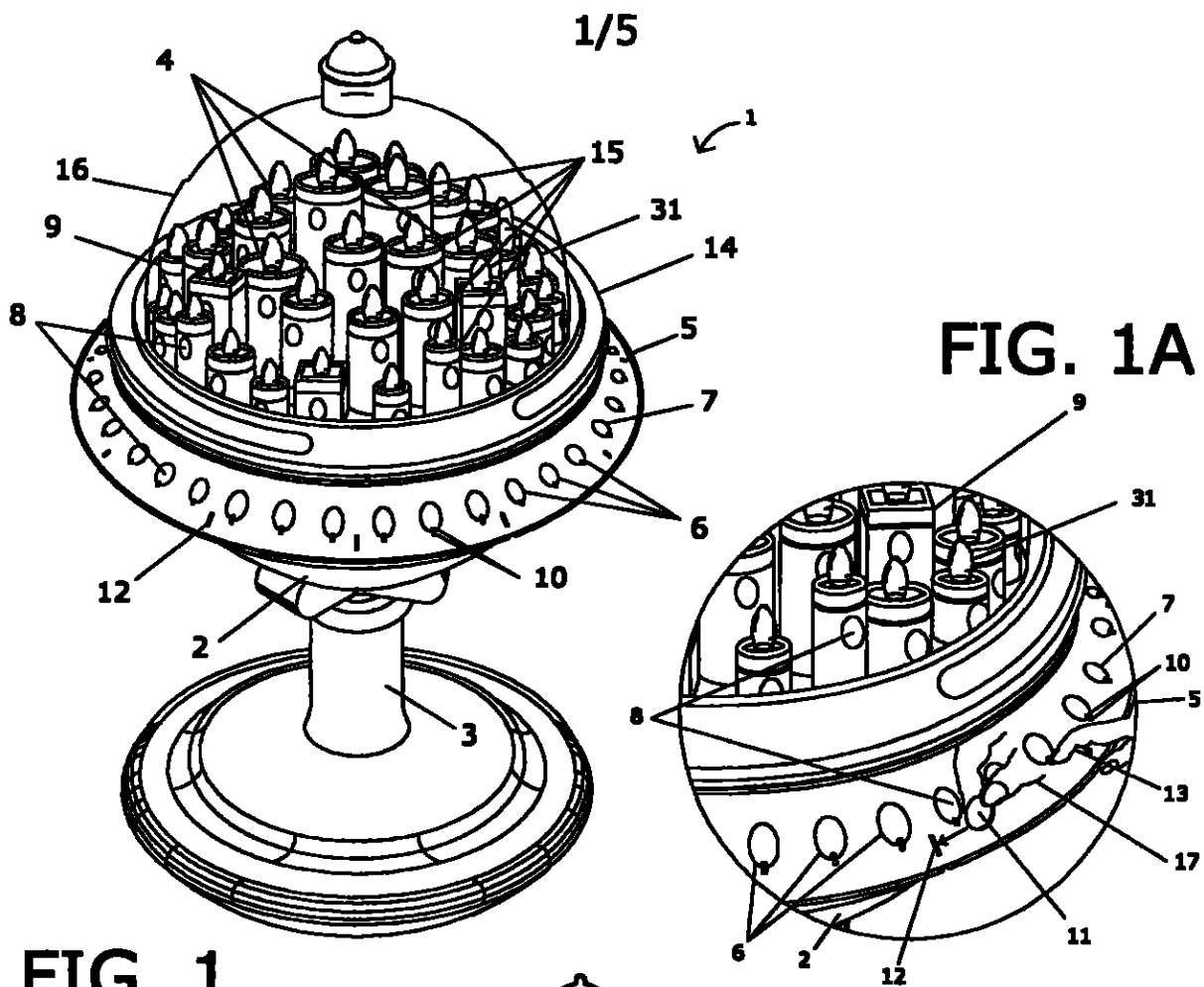
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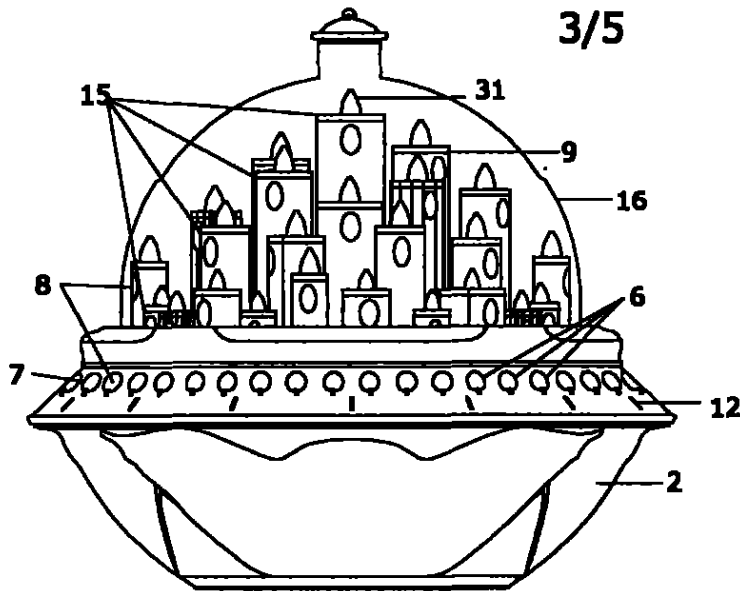


FIG. 5A

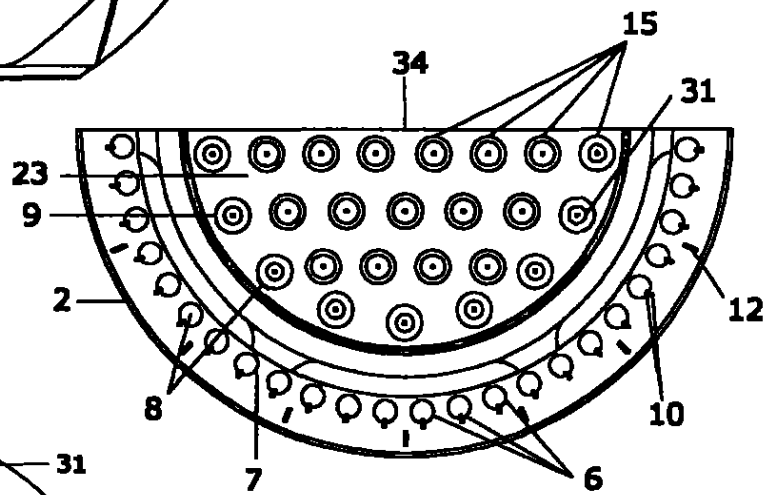


FIG. 6

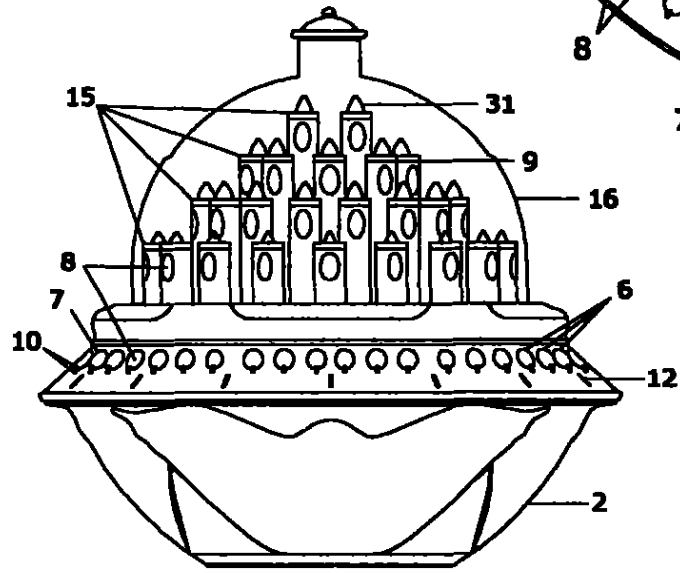


FIG. 6A

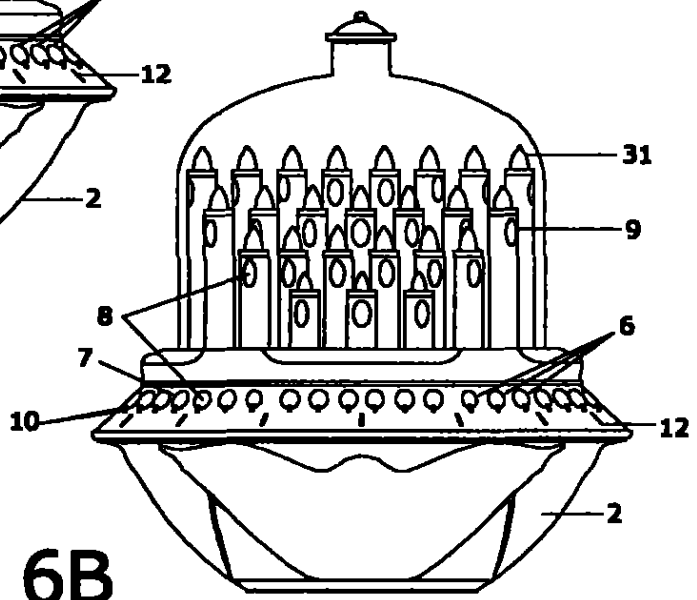


FIG. 6B

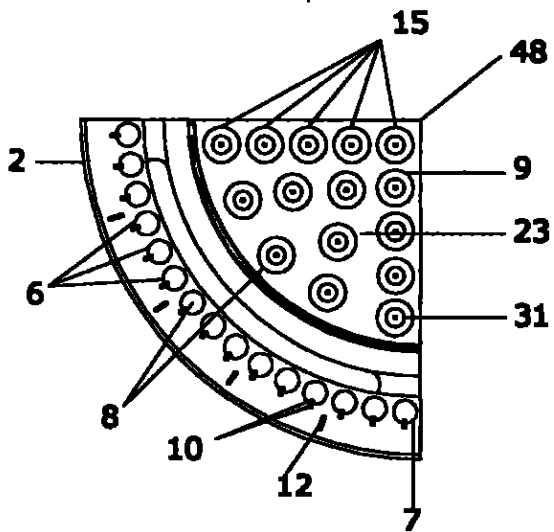


FIG. 7

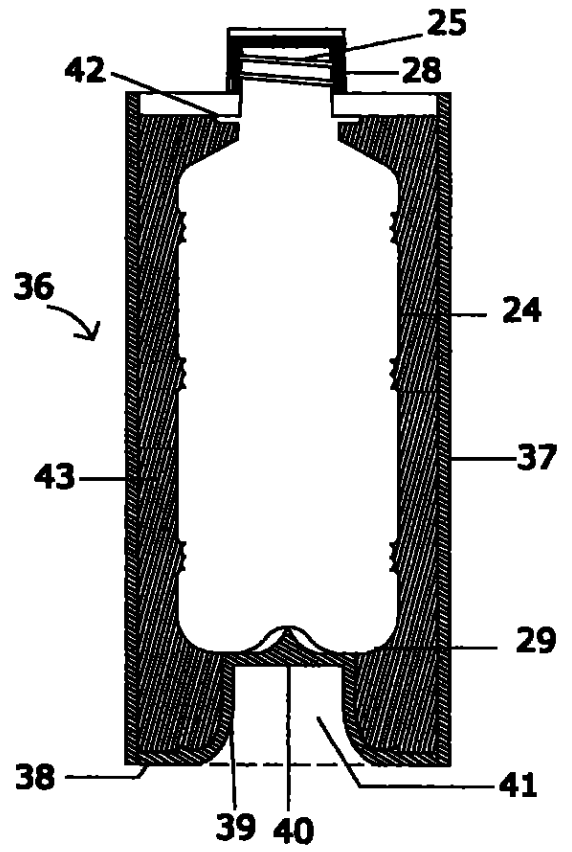


FIG. 8

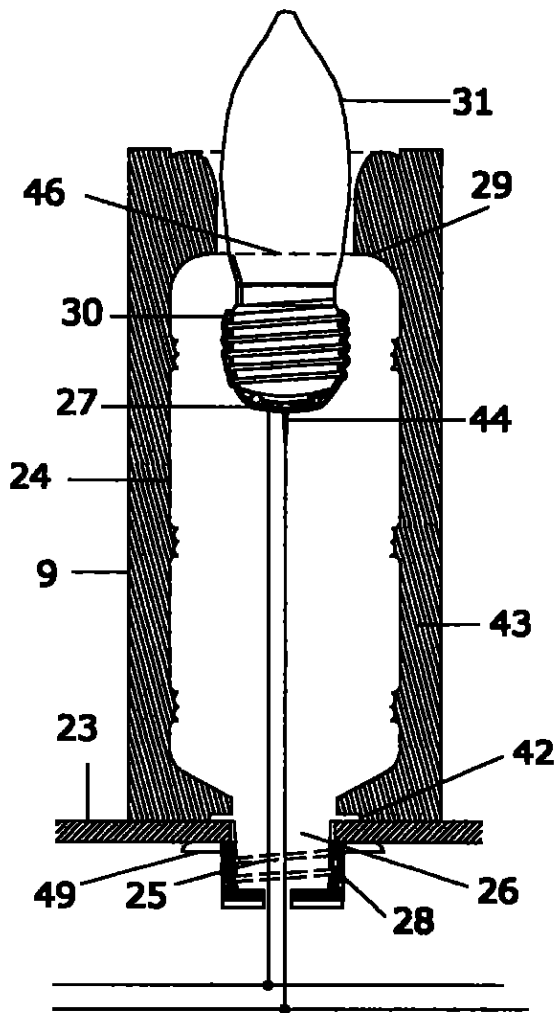


FIG. 9

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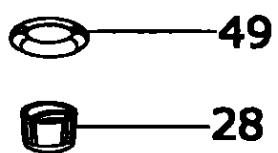
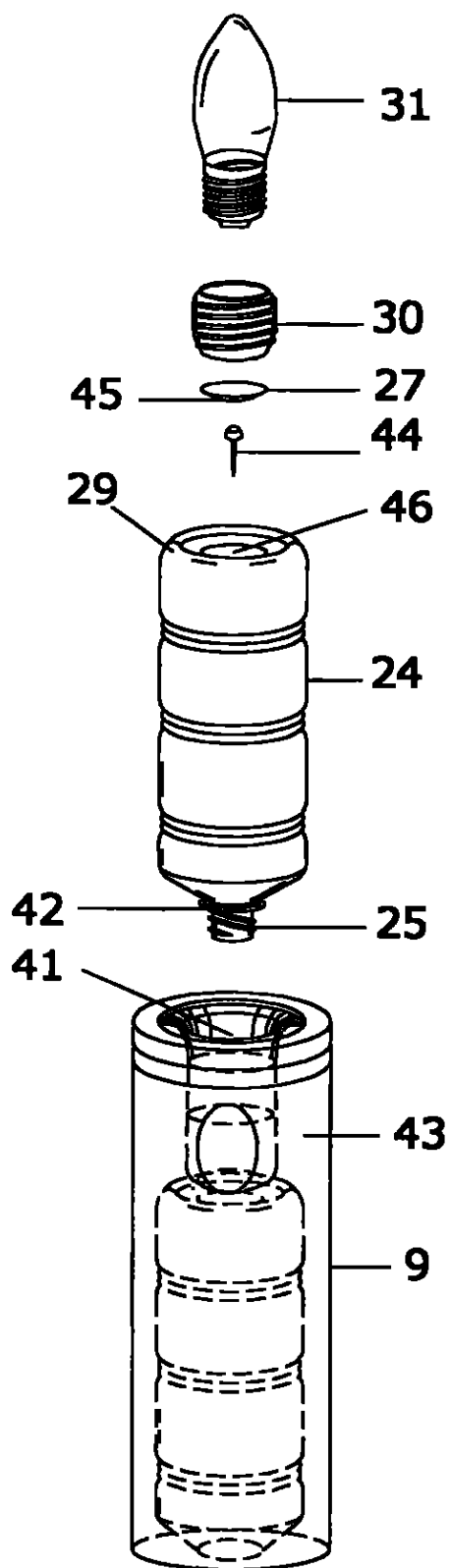


FIG. 10

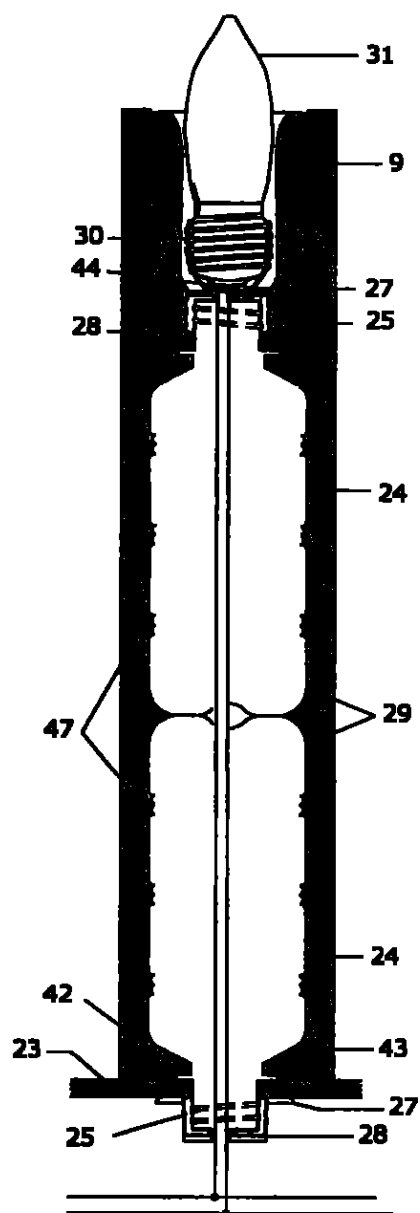


FIG. 11

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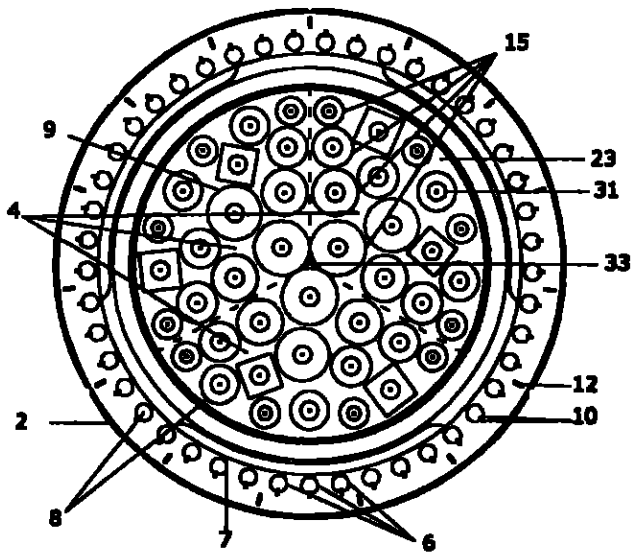


FIG. 3

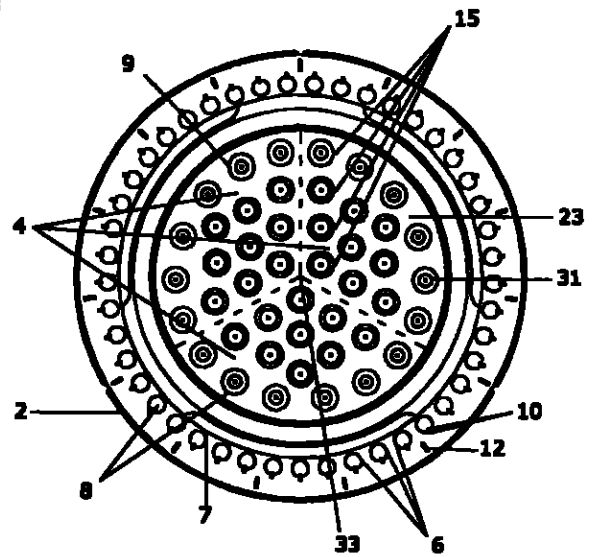


FIG. 4

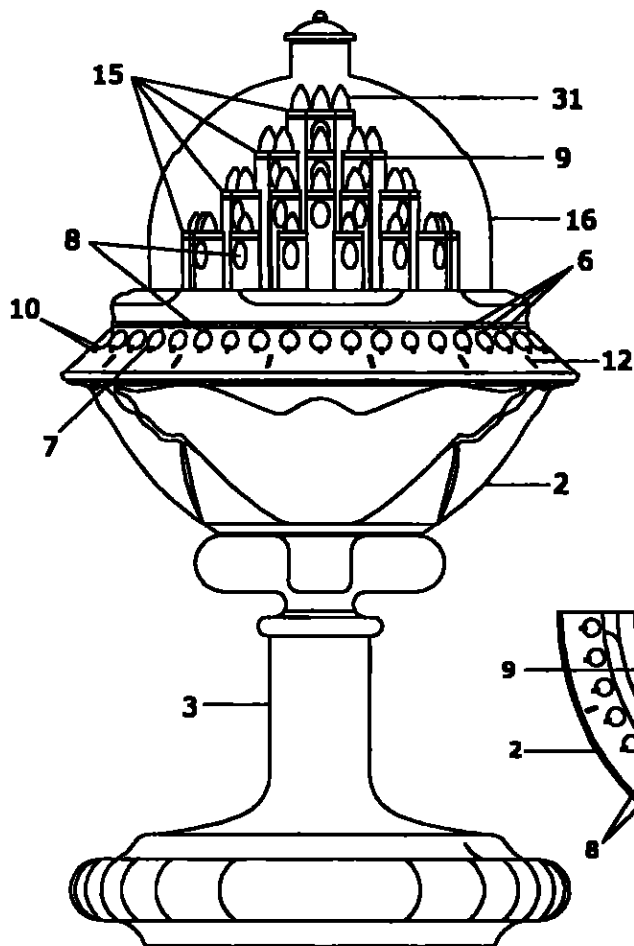


FIG. 4A

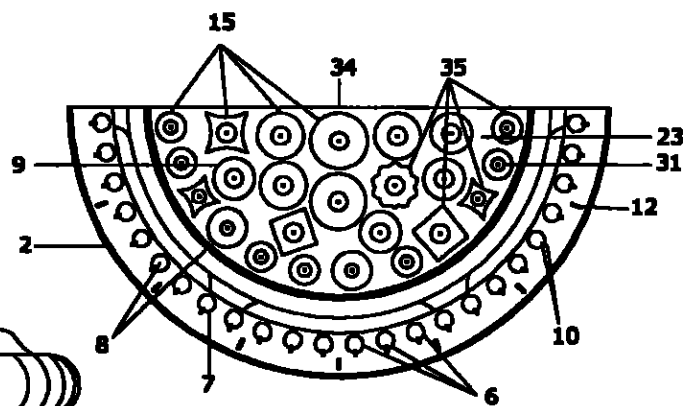


FIG. 5

SISTEMA DE VELAS TEMPORIZADAS, CON SONIDO Y OPERADO CON MONEDAS. Y METODO DE FABRICACIÓN DE LA VELA.

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sector tecnico

La solicitud se refiere, a un sistema de velas temporizadas que emite sonidos en forma de mensajes y es operado con monedas. También se refiere a la forma de operación del mismo. Adicionalmente al método de fabricación de la vela en parafina con lámpara eléctrica para el sistema a partir de un molde con arreglos de recipientes plásticos dentro del mismo.

Su uso se da en iglesias y casas de oración.

técnica anterior

Los sistemas de velas eléctricos actuales operados con monedas ubicados en las iglesias y casas de oración, están constituidos básicamente por un gabinete rectangular o cuadrado en forma de gradas soportando un grupo de velas eléctricas de pantallas plásticas de un solo tamaño, ordenadas en filas y columnas, manteniendo todas una matriz cuadrada o rectangular. Ejemplo: 10 filas de velas por 5 columnas de velas total 50 velas, cada fila de velas está protegida por un caparazón acrílico rectangular, para el ejemplo un total de 5 caparazones porque son 5 filas. Por la forma como está concebido el gabinete y por la configuración que tienen las velas solo se permite acceder a él frontalmente solo por un lado. Las ranuras para el depósito de monedas están ordenadas en una matriz de filas y columnas, manteniendo una relación constante las ranuras y las velas de 1 a 1, Su forma de operación está dada solo por una función para el depósito de una moneda por una y exclusivamente solo una ranura ubicada al frente de la vela encendiéndose la vela solo por un periodo de tiempo determinado, no teniendo otras funciones de operación del sistema, por ejemplo: prolongar el periodo de encendido de la vela a la cantidad de entradas de monedas por una ranura, o encender varias velas al depósito de varias monedas por una misma ranura de entrada de monedas, o la emisión de sonido (voz o música) en forma de mensajes.

En la patente de Estados Unidos 4.228.885 divulga una lámpara eléctrica operada con moneda que se enciende al depósito de una moneda por una ranura que se encuentra al frente de la misma y que hace accionar un switch para cerrar el circuito del bombillo incandescente y del motor en paralelo a la lámpara. El motor maneja una espiral la cual en completa rotación pulsa el switch en una posición abierta para parar el motor y apagar la luz del bombillo.

Convencionalmente la vela de estos sistemas se compone de una pantalla o tubo plástico en forma cilíndrica, hueco por dentro con una lámpara eléctrica en el centro, el cual para sostenerse vertical en el gabinete, utiliza en ocasiones ángulos con tornillos o ganchos, remaches, magnetos o goma de pegar.

De otro lado existe una necesidad continuada de recuperación de materiales plásticos de desecho (recipientes) debido al gran volumen y contaminación que generan. En algunos países un impuesto de desecho se exige sobre el volumen de material que se desecha en la basura.

divulgación de la invención

La invención comprende un sistema conformado por un gabinete de forma semiesférica sostenido sobre una base que toma esa forma cuando el conjunto de velas es

igual o mayor a dos hasta nueve grupos. Y toma la forma de media semiesfera o un cuarto de semiesfera sin base de soporte cuando el conjunto de las velas es igual a un grupo.

Ejemplo: Cuando el conjunto de las velas está conformado por tres grupos de 15 velas para un total de 45 velas, el gabinete toma la forma semiesférica; lo mismo sería para 4 grupos de 15 velas para un total de 60 velas, etc.

Pero cuando el conjunto de velas está conformado por un grupo de 24 velas, el gabinete puede tomar la forma de media semiesfera o un cuarto de media semiesfera; lo mismo sería para un grupo de 15 velas, etc.

El gabinete de forma semiesférica soporta en su parte superior lateral externa una serie de laminillas formando entre sí una circunferencia, con una figura en su interior que la identifica al momento de hacer el encendido de las velas y que corresponde a otra igual ubicada en las mismas, manteniendo una relación directa de 1 a 1 laminillas del gabinete con respecto a las laminillas de las velas.

También se encuentra una serie de ranuras de acceso para la entrada de monedas formando entre sí una circunferencia, configuradas de tal manera con las laminillas del gabinete, que por cada cantidad de laminillas hay una o varias ranuras para entrada de monedas, que mantiene una relación en cantidad de separación de laminillas con respecto a las ranuras de acceso de m a n ranuras de acceso, donde m laminillas es un entero de 1 hasta 5 y n ranuras de acceso es un entero de 0 hasta 3.

Ejemplo: Cuando m laminillas es igual a 3 y n ranuras de acceso igual a 1, la configuración queda de tal manera que por cada 3 laminillas para identificación de cada una de las velas ubicadas en el gabinete hay una ranura de acceso para entrada de monedas.

En cada una de las laminillas ubicadas en el gabinete se encuentra un sensor al tacto ubicado en la parte inferior de las mismas para ser activado con el dedo al contacto con el mismo, previo depósito de una o varias monedas por cualquiera de las ranuras de acceso de un determinado grupo de velas.

En la parte media interna del gabinete se soporta un conjunto de selectores de monedas que utiliza una rampa conformada por dos planos inclinados para regular el recorrido de la moneda y permitir el control de la velocidad de caída por gravedad de la misma y hacer la selección por el diámetro predeterminado de la misma. El selector se ajusta al diámetro de cualquier moneda. Para predeterminar la selección de la moneda por el diámetro solo basta colocar una moneda de referencia en el selector que sostiene una pieza corrediza del mismo y hacer el desplazamiento un milímetro mas abajo de la altura de la moneda, enseguida se ajustan unos tornillos que sostienen la pieza.

El selector de monedas por la parte alta se comunica al exterior del gabinete por una ranura de acceso que es la entrada de monedas y por la parte baja en la salida soporta un sensor opto acoplador infrarrojo, compuesto de un elemento transmisor y uno receptor colocados de tal manera que el rayo infrarrojo sea obturado por el paso de una o varias monedas y así verificar la entrada de la moneda.

En el caso de presentarse una avería en cualquiera de las ranuras de acceso de entrada de

monedas en la selección de encendido de una o varias velas, solo quedaría fuera de servicio esa ranura de acceso, teniendo la posibilidad de encender las mismas velas seleccionadas al depósito por otras ranuras de acceso.

En la parte baja interna del gabinete se alojan unas alcancias para el depósito de las monedas.

En su parte superior el gabinete de forma semiesférica soporta una plataforma circular donde se sostiene un conjunto de velas. Las velas se configuran en uno o varios grupos iguales dispuestos cada uno por un número determinado de velas, la configuración está dada por $p \cdot q$ velas, donde p es el número de grupos y q el número de velas, y donde p es un entero de 1 hasta 9 y q es un entero múltiplo de 3; desde 3 hasta 84.

Las velas están dispuestas desde el centro de la plataforma ubicada en el gabinete hacia afuera, de mayor a menor; en diferentes tamaños, formas y grosores identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, dando entre sí la apariencia de un cono truncado.

Todo el conjunto de velas está protegido por un domo semiesférico.

Por la configuración que tienen las ranuras y laminillas en el gabinete formando una circunferencia y por la configuración y disposición de las velas en varios grupos, tamaños y formas dando la apariencia de un cono truncado, permite que varias personas accedan a él simultáneamente por cualquiera de sus lados (los 360 grados) y tengan la posibilidad de operar el sistema de velas bajo varias modalidades de encendido, sin que se presenten interferencias entre ellas.

Otra forma de configuración de las velas puede estar dada para varios grupos de velas, dispuestas desde el centro de la plataforma del gabinete de forma semiesférica con base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una forma y grosor, identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde todas dan la apariencia de un cono truncado. Todo el conjunto de velas está protegido por un domo semiesférico.

Otra forma de configuración de las velas puede estar dada para un grupo de velas, dispuestas desde el borde interno central de la plataforma del gabinete de forma media semiesfera y sin base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una o varias formas y grosores, identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde todas dan entre sí la apariencia de medio cono truncado, protegidas por un domo.

Otra forma de configuración de las velas puede estar dada para un grupo de velas, dispuestas desde el borde interno de la plataforma del gabinete de forma media semiesfera y sin base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una o varias formas y grosores identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde

todas dan la apariencia de una cascada, protegidas por un domo.

Otra forma de configuración de las velas puede estar dada para un grupo de velas, dispuestas desde la unión de los dos bordes internos de la plataforma del gabinete de forma un cuarto de semiesfera y sin base de soporte, hacia afuera de mayor a menor en diferentes tamaños, una o varias formas y grosores identificadas cada una para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete, donde todas dan la apariencia de un cuarto de cono truncado, protegidas por un domo.

El gabinete en la parte superior interna aloja un altavoz por cada grupo de velas disponibles para la emisión de sonido (voz o música) en forma de mensajes.

Independientemente de la forma de operación de encendido que ejecute la persona, solo sonará un altavoz en un momento determinado, jamás sonarán todos al mismo tiempo.

Las distintas partes del sistema de velas como sensores al tacto ubicado en las laminillas para selección de las velas, sensores opto acopladores infrarrojos en las salidas de los selectores de monedas para detectar la entrada de cada una de ellas, lámparas en cada una de las velas para encendido y temporización de las mismas, altavoces para la emisión de sonido (voz y/o música) en forma de mensajes, están interconectados para su funcionamiento con un dispositivo de control, por ejemplo: electrónico programable.

Sobre la base de las siguientes descripciones de funcionamiento tal control es fácilmente imaginable para los expertos en la materia y por lo tanto no se representa en adelante, se hace sobre la base de las siguientes descripciones de funciones:

Primera:

Para el encendido de una vela temporizada en un periodo de tiempo, depositando una moneda por una ranura de acceso y dando emisión de sonido (voz y/o música) en forma de mensajes.

Se deposita una moneda por una ranura de acceso y se selecciona una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto con un dedo en el sensor al tacto ubicado en ella; se enciende la vela por un periodo de tiempo determinado, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes por unos segundos.

Segunda:

Para el encendido de una vela temporizada en uno o varios periodos, depositando una o varias monedas por una ranura de acceso y a su vez dando una emisión de sonido cuando la configuración de las laminillas con respecto a las ranuras es de 1 a 1.

Se deposita una moneda por una ranura de acceso correspondiente a la laminilla de la vela deseada, se enciende la vela a su vez se da una emisión de sonido (Voz y/o música) en forma de mensajes por unos segundos. Para acumular periodos de temporización de encendido de la vela es preciso depositar x número de monedas por la ranura correspondiente a la laminilla y hacer contacto en el sensor al tacto tantas veces como monedas se hayan depositado, dándose a su vez una secuencia de sonidos (voz y/o música) en forma de mensajes.

Tercera:

Para el encendido de una vela temporizada en varios periodos de tiempo, depositando monedas por una o varias ranuras de acceso de entrada de monedas y dando una emisión de sonido (voz y/o música) en forma de mensajes.

Se depositan varias monedas por una o varias ranuras de acceso y se selecciona una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto varias veces en el sensor al tacto ubicado en ella, igual al número de monedas depositadas, se enciende la vela deseada manteniéndose encendida por varios periodos de tiempo iguales al número de veces de contactos realizados en el sensor al tacto, a su vez se da una secuencia de emisiones de sonidos (voz y/o música) en forma de mensajes por unos segundos, iguales al número de veces de contactos realizados con el dedo en el sensor al tacto en la laminilla.

Ejemplo: Si cada periodo de tiempo de encendido de la vela del sistema se ha programado para que se mantenga encendida 3 minutos y se han depositado 4 monedas por una o varias ranuras de acceso y se ha realizado 4 veces contacto en un sensor al tacto en una laminilla correspondiente a una vela deseada. Se enciende la vela deseada manteniéndose encendida por 12 minutos a su vez se da la emisión de sonido (4 mensajes secuenciales de voz y/o música). Cada mensaje se reproduce aproximadamente en un tiempo de 7 s. para un tiempo total de emisión de sonido de 28 s. aproximadamente.

Cuarta:

Para el encendido de varias velas temporizadas en un periodo de tiempo, depositando monedas por una ranura de acceso y dando emisión de sonido (voz o música) en forma de mensajes.

Se depositan varias monedas por una ranura de acceso se seleccionan varias laminillas en el gabinete correspondientes a las velas deseadas e igual al número de monedas depositadas y se hace contacto en cada una de ellas en el sensor al tacto una sola vez. Se encienden las velas seleccionadas y se da a su vez varias emisiones de sonido (voz y/o música) en forma de mensajes por unos segundos iguales en número de veces a los contactos realizados con el dedo en los sensores al tacto ubicados en cada laminilla.

Quinta:

Para el encendido de varias velas temporizadas en uno o varios periodos de tiempo, depositando monedas por varias ranuras de acceso de entradas de monedas y dando emisión de sonido (voz y/o música) en forma de mensajes.

Se depositan monedas por varias ranuras deseadas se seleccionan varias laminillas correspondientes a las velas deseadas haciendo contacto en el sensor al tacto en cada una de ellas igual al número de monedas depositadas, se encienden las velas seleccionadas manteniéndose encendidas cada una por uno o varios periodos de tiempo determinado, a su vez se da una secuencia de emisiones de sonido (voz y/o música) en forma de mensajes iguales al número de contactos realizados con el dedo en el sensor al tacto en cada una de las laminillas.

Sexta:

Cuando todas las velas se encuentran encendidas y no hay emisión de sonido, en el

momento de acceder al encendido de mas velas.

Se podrá actuar en cualquiera de las funciones anteriores, la diferencia radica en que se acumularán mas periodos de temporización, manteniendo encendidas la o las velas por mas tiempo, a su vez se da la emisión de sonido (voz y/o música) en forma de mensajes inmediatamente, uno detrás del otro.

Séptima:

Cuando hay emisión de sonido en el momento de acceder al encendido de mas velas.

Se podrá actuar en cualquiera de las funciones anteriores, la diferencia radica en que la emisión de sonido(voz y/o música) en forma de mensajes se acumulará llevándose a una cola de espera para luego ser emitidas secuencialmente.

Octava:

Si se alcanza una condición igual o mayor de periodos de tiempo de encendido acumulados en una vela haciendo contacto en un sensor al tacto en una laminilla del gabinete hasta alcanzar un tope mínimo predeterminado dando a su vez una emisión de sonido prolongada (voz y/o música) en forma de mensajes.

Se deposita una cantidad mínima de monedas por una o varias ranuras de acceso, se selecciona una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto con un dedo en el sensor al tacto ubicado en ella, tantas veces como monedas se hayan depositado y alcanzando una condición igual o mayor predeterminada en el sistema, se enciende la vela seleccionada por varios periodos de tiempo y se da una emisión de sonido por varios segundos; una serie de mensajes predeterminados en forma secuencial.

Ejemplo: Si cada periodo de encendido de la vela dura tres minutos, y se ha predeterminado mínimo 6 monedas para escuchar una oración. Se depositan seis monedas mínimo por una o varias ranuras de acceso, se selecciona una laminilla en el gabinete correspondiente a la vela deseada y se hace contacto con un dedo seis veces en el sensor al tacto ubicado en ella se enciende la vela seleccionada manteniéndose encendida por dieciocho minutos a su vez se da la emisión de sonido, una oración que se reproduce por un periodo de tiempo aproximado de 30 s.

Novena:

Ajuste del periodo de temporización de la vela presionando un suiche en el gabinete.

El sistema permite ajustar el periodo base de tiempo de encendido de la vela, accionando un switch o pulsador dentro del gabinete, correspondiente a distintos valores predeterminados de incremento de periodos de temporización.

Ejemplo: Si la vela se programa para que se mantenga encendida por cuatro minutos y si se determina un incremento de dos minutos, se presiona el switch o pulsador ubicado dentro del gabinete en la posición predeterminada a un incremento de dos minutos, quedando el periodo base de temporización de encendido de la vela para seis minutos.

Décima :

Acumulado o cambio de nuevos mensajes para el sistema de velas vía internet.

Cuando se desee el acumulado o cambio de nuevos mensajes para el sistema de velas, el

sistema se comunicará a la red mundial (internet) accediendo a una dirección correspondiente a una página web donde se ofrecerá el servicio de cambio o adición de uno o varios mensajes en particular.

Décima Primera:

Diagnóstico de operación del sistema de velas accionando un switch en el mismo o a través de la web.

En el sistema de velas se encuentra un switch para accionarlo a una de sus dos posiciones la cual estaría determinada para que realice un monitoreo general a todo el sistema y permita hacer un diagnóstico de operación del sistema y reportar cualquier avería de cualquiera de las distintas partes componentes del sistema que están interconectadas para su funcionamiento. El diagnóstico se podrá hacer a través de la web conectándose por medio de un puerto de entrada /salida ubicado en el sistema.

La divulgación también está dirigida hacia el método de fabricación de la vela para el sistema de velas temporizadas, con emisión de sonido y operado con monedas; el cual comprende un molde compuesto de una pared lateral sustancialmente circular cerrado en el extremo inferior por la base. La base tiene una porción de cuerpo que se soporta sobre una superficie plana. Extendiéndose desde la base se encuentra una pared de transición que termina en la pared de soporte; que sirve para sostener por la parte interna de la misma un recipiente plástico sostenido a su vez por la base del mismo. La pared de transición que se extiende hacia arriba tiene una profundidad de por lo menos la longitud de una lámpara eléctrica. En el otro extremo superior de la pared del molde para la vela está la abertura del mismo por donde se introduce un arreglo de recipientes plásticos reciclados. El cuerpo del molde en su contorno puede tomar la forma cuadrada, esférica, piramidal o de cono truncado.

La disposición o arreglos de recipientes dentro del molde puede estar dado por la ubicación de un recipiente mas pequeño al tamaño del molde, de tal manera que la base del mismo quede hacia abajo sobre la pared de soporte interna del molde, que sirve posteriormente después de desmoldada para soportar la lámpara eléctrica; y el pico de vertido con sus roscas para sostener el cuerpo de la vela sobre la plataforma del gabinete.

También se pueden alojar dos recipientes plásticos reciclados en el interior del molde unidos por sus dos bases (esta forma de arreglo se da cuando la pared de transición que sostiene la pared de soporte no es lo suficientemente alta como para alojar el pico de vertido de otro envase) quedando un pico de vertido con sus roscas y tapa hacia la parte alta del molde para de allí posteriormente asegurarlo a la plataforma del gabinete. O pueden ubicarse en el interior del molde dos o mas recipientes en arreglo de apilado llevando el pico de vertido de un primer recipiente a hacer contacto con la base de un segundo recipiente, quedando siempre un pico de vertido hacia arriba en el molde. Esta posición de los envases dentro del molde se da cuando se requiere de velas de poco grosor y altos tamaños. Otra forma de arreglo de los recipientes dentro del molde puede darse para tres recipientes plásticos reciclados unidos por sus lados, quedando las bases hacia abajo y los picos de vertido con

sus roscas hacia la parte alta del molde. Esta posición de los envases dentro del molde se da cuando se requiere de velas de alto grosor y baja altura.

Para la fabricación de la vela del sistema se procede de la siguiente manera:

Se aplica desmoldante en la parte interna de un molde de tamaño, forma y grosor de la vela deseada, se ubica en el interior del molde un arreglo de recipientes plásticos reciclados construido de un material de alta resistencia a la tensión preferible los fabricados en tereftalato de polietileno (PET) con un refrigerante en su interior. El siguiente paso es colocar parafina en un recipiente, se introduce dentro de una vasija y se lleva a baño de María, se calienta hasta que la parafina se funde. Se agrega el tinte deseado. Cuando la parafina alcance aproximadamente 343 grados Kelvin volcarla en el molde que contiene el recipiente plástico hasta alcanzar el reborde de proyección circundante ubicado debajo de la rosca del recipiente, se deja solidificar y enfriar, finalmente desmoldar. Luego se adorna igual a las velas de parafina con pabilo, es decir con celofán, pintura, etc., incluyéndole todos los rasgos ventajosos de la vela tradicional pero que es estructuralmente mejorado para hacerla mas liviana y fácil de instalar.

Enseguida se abre un orificio en el centro de la pared de soporte del recipiente que quedó ubicado dentro del cuerpo de la vela de parafina, para que de allí se sostenga la lámpara eléctrica; la arandela resultado de esta operación se ubica en el interior de un zócalo, se le abre un pequeño orificio en el centro y por allí se hace pasar un remache para que sea un electrodo de la lámpara que se ajusta en él, se hace la conexión eléctrica soldando los cables al zócalo y sacándolo por el pico de vertido del recipiente que queda en la parte baja del cuerpo de la vela de parafina.

En la plataforma circular que se ubica en la parte superior del gabinete hay una serie de orificios al ancho del pico de vertido de cada recipiente; la forma de instalar las velas allí es: Ubicar un orificio por encima de la plataforma del gabinete que corresponde a una vela predeterminada, se monta la vela quedando el cuerpo de la misma y el reborde de proyección circundante sobre la plataforma y el pico de vertido con las roscas traspasando el orificio. Por debajo se coloca una arandela dentro de las roscas construida de la base de otro recipiente, enseguida se asegura la vela haciendo el cierre con la tapa contra las roscas del pico de vertido del recipiente. En la parte superior de la vela se coloca una laminilla que contiene una figura y que corresponde a otra igual ubicada en el gabinete.

BREVE DESCRIPCIÓN DE LOS DIBUJOS

Fig.1 es una vista en perspectiva del sistema de velas.

Fig. 1 A es una vista en detalle del sistema de velas de la Fig. 1.

Fig. 2 es una vista en corte del sistema de velas representado en la Fig.1

Fig. 3 es una vista en planta donde se ve la configuración de las velas representada en la Fig.1.

Fig. 4 es una vista en planta de otra forma de configuración de las velas.

Fig. 4 A es una vista en alzado de la configuración de las velas representada en la Fig.4 donde todas dan la apariencia de un cono truncado ubicadas en un gabinete de apariencia

forma semiesférica.

Fig. 5 es una vista en planta de otra forma de configuración de las velas ubicadas en un gabinete de forma media semiesfera.

Fig. 5 A es una vista en alzado de la configuración de las velas representada en la Fig. 5 donde todas dan la apariencia de un cono truncado y el gabinete sin base de soporte.

Fig. 6 es una vista en planta de otra forma de configuración de las velas ubicadas en un gabinete de forma media semiesfera.

Fig. 6 A es una vista en alzado de la configuración de las velas representada en la Fig. 6 donde todas dan la apariencia de un cono truncado y el gabinete sin base de soporte.

Fig. 6 B es una vista en alzado de la configuración de las velas representadas en la Fig. 6 donde todas dan la apariencia de una cascada y el gabinete sin base de soporte.

Fig. 7 es una vista en planta de otra forma de configuración de las velas ubicadas en un gabinete de forma un cuarto de semiesfera.

Fig. 8 es una vista en corte del molde de la vela, alojando un recipiente plástico.

Fig. 9 es una vista en corte de la vela de parafina para el sistema.

Fig. 10 es una vista en despiece de la vela, representada en la Fig. 9

Fig. 11 es una vista en corte de un arreglo de dos recipientes plásticos alojados en la vela de parafina para el sistema.

DESCRIPCIÓN DE LA INVENCION CON RESPECTO A LAS FIGURAS

Tal como se anotó la invención está dirigida hacia un sistema de velas temporizadas con emisión de sonido, operado con monedas; a la forma de operación del mismo, como también al método de fabricación de la vela para el sistema. Este sistema se describe en más detalle con referencia a los dibujos. En la Fig. 1 Se representa el sistema de velas 1 el cual está conformado por un gabinete semiesférico 2 sostenido sobre una base 3, toma esa forma cuando el conjunto de velas 4 es igual o mayor a dos hasta nueve grupos; dicho gabinete 2 soporta en su parte media lateral externa 5 una serie de laminillas 6 que forman entre sí una circunferencia, cada laminilla 7 ubicada en el gabinete 2 contiene una figura que corresponde a otra igual 8 ubicada en cada vela 9, las cuales se identifican entre sí cuando se va a hacer la selección de encendido de las mismas, manteniendo una relación directa de 1 a 1 laminillas. En cada laminilla 7 ubicada en el gabinete 2 hay un sensor al tacto 10 ubicado en su parte inferior y se activa al depositar una o varias monedas 11 por una ranura de acceso 12 y al hacer contacto con un dedo 13 en cada una de ellas.

Al lado inferior de las laminillas 6 ubicadas en el gabinete 2 se encuentra una serie de ranuras 12 para entrada de monedas formando entre sí una circunferencia, configuradas de tal manera las laminillas del gabinete 6 con respecto a las ranuras de acceso 12 que mantienen una relación de m a n ranuras.

En la parte superior 14 el gabinete 2 soporta una plataforma donde se sostiene el conjunto de velas 4 configuradas en varios grupos dispuestas desde el centro de la plataforma hacia afuera de mayor a menor 15 en varios tamaños formas y grosores. Todo el conjunto de velas 4 da la apariencia de un cono truncado y están protegidas por un domo semiesférico 16.

La Fig. 1 A muestra una vista en detalle del sistema de velas 1 temporizadas de la Fig.1 ilustra una forma de operación del mismo; una mano 17 operando el sistema de velas 1 mediante la introducción de una moneda 11 por una de las ranuras de acceso 12 que conduce a un selector de monedas y un dedo 13 haciendo el cierre en un sensor al tacto 10 al contacto con el mismo en una de las laminillas 7 del gabinete 2 que contiene una figura que la identifica al hacer el encendido de una vela 9 y que corresponde a otra igual 8 ubicada en las velas, encendiéndose la vela 9 y manteniéndose temporizada por un periodo determinado, a su vez se produce una emisión de sonido en forma de mensaje. La combinación de estos eventos se hace sobre la descripción de una función permitiendo así la operatividad del sistema.

En la Fig. 2 vista en corte, se puede observar el sistema de velas 1 en su parte interna, a la altura media 5 del gabinete 2 soporta un conjunto de selectores de monedas 18 para hacer la selección por el diámetro predeterminado de las mismas.

El selector por la parte alta 19 se comunica al exterior del gabinete 2 por una ranura 12 que es la entrada de monedas 11 y por la parte baja en la salida soporta un sensor opto acoplador infrarrojo 20 para verificar la entrada de la moneda 11. En la parte baja del gabinete se alojan unas alcancias 21 para el depósito de la moneda 11.

En la parte superior 14 interna el gabinete 2 aloja los altavoces 22 dispuestos para la emisión de sonido (Voz o música); uno para cada grupo de velas.

Se puede observar la plataforma 23 que sostiene el conjunto de velas dispuestas desde el centro de la plataforma en varios tamaños 15 formas y grosores; el cuerpo de las velas 9 alojan en su interior un recipiente plástico reciclado 24 y sostenido por el mismo, la rosca 25 traspasa un orificio 26 de la plataforma 23 del ancho de la misma, por debajo de la plataforma 23 en la rosca 25 se coloca una arandela plástica 49 construida de la base de otro recipiente 24, enseguida se asegura la vela 9 haciendo el cierre con la tapa 28 junto a la rosca 25 del recipiente 24 quedando así ajustada la vela 9 por el soporte del mismo. En la base 29 del recipiente 24 alojado en el cuerpo de la vela 9 hay un orificio 46 en el cual se soporta la lámpara eléctrica 31 dentro de un zócalo 30.

El conjunto de velas está protegido por un domo 16 en forma de cúpula y todo el gabinete 2 reposa sobre una base 3.

Las distintas partes del sistema de velas 1, sensores al tacto 10, sensores opto acopladores infrarrojos 20, lámparas eléctricas 31 en cada una de las velas 9, altavoces 22, están interconectados para su funcionamiento con un dispositivo de control 32, por ejemplo: electrónico programable.

Tal control es fácilmente imaginable por los expertos en la materia por lo tanto no se representa, se hace sobre la descripción de una función.

En la Fig.3 vista en planta del sistema de velas 1, muestra una configuración de las velas de la Fig.1 dispuestas desde el centro 33 de la plataforma 23 del gabinete 2 de mayor a menor 15 en varias formas y grosores; se observan alrededor de la plataforma 23 del gabinete 2 las laminillas 6 con sus sensores 10 en la parte inferior de las mismas y sus ranuras 12 de

entrada de monedas 11 formando entre sí una circunferencia, configuradas de tal manera que por m cantidad de laminillas 6 corresponde n ranuras de acceso 12 para entrada de monedas. Tal configuración está dada por una relación de m a n ranuras, donde m laminillas es un entero de 1 hasta 5 y n ranuras de acceso 12 es un entero de 0 hasta 3.

La Fig. 4 muestra la misma configuración de las velas de la Fig. 3 pero dispuestas desde el centro 33 de la plataforma 23 del gabinete 2 hacia afuera en varios tamaños 15 una forma y grosor; se observa al rededor de la plataforma 23 la configuración de las laminillas 6 con sus sensores 10 en la parte inferior y sus ranuras de entrada de monedas 12, formando una circunferencia. Y en la Fig. 4 A se observan las velas de la Fig. 4 dispuestas en varios tamaños 15 una forma y grosor dando todas la apariencia de un cono truncado, así como también las laminillas 6 y ranuras de acceso 12 formando entre sí una circunferencia y el gabinete 2 sostenido sobre una base 3.

Otra forma de configuración de las velas se aprecia en la Fig. 5 y Fig. 5 A dispuestas en el gabinete 2 desde el borde interno central 34 de la plataforma 23, toma esa forma el gabinete 2 porque el conjunto de las velas está dado por un grupo de las mismas, y sin base 2 de soporte, hacia afuera de mayor a menor en diferentes tamaños 15, formas 35 y grosores identificada cada una para su encendido por una laminilla 8 ubicada en la vela 9 y el gabinete 2. Todas las velas dan la apariencia de medio cono truncado protegidas por un domo 16.

La Fig. 6 y la Fig. 6 A muestran otra forma de configuración de las velas dispuestas desde el borde interno central 34 de la plataforma del gabinete 2 de forma media semiesfera, toma esa forma el gabinete 2 porque el conjunto de las velas 4 está dado por un grupo de las mismas y sin base de soporte, hacia fuera de mayor a menor 15 en diferentes tamaños una forma y grosor dando entre sí la apariencia de un cono truncado.

La Fig. 6 B es la misma configuración anterior de velas solo que el conjunto de las velas dan entre sí la apariencia de una cascada.

En la Fig. 7 se observa otra forma de configuración de las velas dispuestas desde la unión de los dos bordes internos 48 de la plataforma 23 del gabinete 2 de forma un cuarto de semiesfera, toma esa forma el gabinete 2 porque el conjunto de velas está dado por un grupo de las mismas y sin base de soporte hacia fuera de mayor a menor 15 en diferentes tamaños una forma y grosor dando entre si la apariencia de un cuarto de cono truncado.

La vela 9 para el sistema de velas 1 de cualquier configuración, se fabrica a partir de un molde 36. En la Fig. 8 se muestra el molde 36 compuesto de una pared lateral 37 circular o puede tomar la forma triangular, piramidal, cuadrada, rectangular o de cono truncado; según la forma de la vela 9 deseada. El molde 36 está cerrado en un extremo por la base 38. La base 38 soporta el molde sobre una superficie plana. Extendiéndose desde la base 38 se encuentra una pared de transición 39 que termina en la pared de soporte 40 y que sirve para sostener por la parte interna de la misma un recipiente 24 plástico reciclado sostenido a su vez sobre su base 29.

El procedimiento a seguir para fabricar la vela en parafina con lámpara eléctrica 9 se da

alojando uno o varios recipientes plásticos 24 en el molde 36 en arreglos predeterminados según el tamaño o grosor de la vela 9 para la configuración del sistema 1, con un refrigerante en su interior, una forma de posición de los recipientes 24 dentro del molde 36 puede estar dado por la Fig. 8 un recipiente plástico 24 con la base 29 hacia abajo y la rosca 25 con el cierre de su tapa 28 hacia arriba. Se aprecia en el extremo inferior central del molde una entrante 41 que sirve de soporte del recipiente plástico 24 y a su vez de cabida para la posterior ubicación de la lámpara eléctrica 31 de la vela 9. En un recipiente metálico se calienta parafina y cuando alcance una temperatura de 338 grados kelvin se riega sobre el molde 36 que contiene el recipiente plástico 24 alcanzando el tope máximo de vaciado que está dado por el final del reborde de proyección circundante 42 ubicado debajo de la rosca 25 del recipiente 24 y que posteriormente sirve de soporte de la vela 9 junto con el cierre de la tapa 28 contra la plataforma 23. Se deja enfriar y desmoldar. Luego se adorna igual a las velas de parafina con pabilo.

En la Fig. 9 se aprecia el cuerpo de la vela en parafina 43 de la Fig. 8 desmoldado alojando un recipiente 24 plástico ubicado de tal manera que la base 29 del recipiente 24 con un orificio 46 queda hacia arriba como soporte de la lámpara 31 que aloja el zócalo 30 de la misma y la rosca 25 queda hacia abajo como soporte de la vela 9 para asegurarla a través del cruce del mismo por un orificio 26 en la plataforma 23 y haciendo el cierre junto con una arandela plástica 49 y tapa del mismo 28 contra la rosca 25 del recipiente 24.

La Fig. 10 es un despiece total de la vela 9; se observa la tapa 28 con la arandela plástica 49 para asegurar la vela 9 a la plataforma 23.

El cuerpo 43 de la vela 9 construido en parafina o gel mantiene al exterior los rasgos de una vela tradicional pero que es estructuralmente mejorado para hacerla mas liviana.

El recipiente plástico 24 que utiliza el reborde de proyección circundante 42 junto a la rosca 25 como soporte del cuerpo de la vela 9, y la base 29 del mismo con un orificio 46 como soporte de la lámpara eléctrica 31 y del zócalo 30; ofrece la ventaja de ser muy fácil de instalar en la plataforma 23 del sistema de velas 1.

Un remache 44 que actúa como un electrodo de la lámpara eléctrica 31 incrustado por el orificio central 44 de una arandela plástica 27 resultado de la operación de abrir un orificio 46 en la base 29 del recipiente 24 para sostener la lámpara eléctrica 31.

Un zócalo 30 que aloja la arandela 27 anterior junto al remache 44, y una lámpara eléctrica 31 que se enciende y se mantiene temporizada dependiendo de las distintas formas de operación del sistema de velas 1.

Cuando se deseen velas de altos tamaños y poco grosor pueden alojarse en su interior dos recipientes plásticos 47 unidos por sus dos bases 29 quedando un recipiente 24 con la rosca 25 hacia abajo para sujetar la vela 9 y el otro recipiente 24 con la rosca 25 y tapa 28 hacia arriba como soporte del zócalo 30 que contiene la lámpara eléctrica 31.

Pueden hacerse varias modificaciones a la presente divulgación pero aún dentro de los presentes conceptos todas estas modificaciones se consideran como dentro de la misma.

REIVINDICACIONES

Lo que se reivindica es:

1. Un sistema para el encendido de velas temporizadas, con emisión de sonido, operado con monedas caracterizado por un gabinete de forma semiesférica, dicho gabinete se sostiene sobre una base y aloja una configuración de laminillas que forman entre si una circunferencia para identificación y selección de las velas y de ranuras de acceso para entrada de monedas, manteniendo una relación en cantidad de separación de laminillas con respecto a las ranuras, dichas laminillas mantienen también una relación con respecto a las velas, las laminillas del gabinete corresponden a otras iguales ubicadas en las velas, dichas velas se configuran por grupos, dichos grupos a su vez están conformados por un número determinado de velas dispuestas sobre una plataforma, dicha disposición de las velas está dada desde el centro de la plataforma del gabinete hacia afuera, de mayor a menor, en varios tamaños, una o varias formas y grosores identificadas para su encendido por una laminilla que contiene una figura en la parte superior de la vela y que corresponde a otra igual ubicada en el gabinete; todo el conjunto de velas se protege con un domo semiesférico y se aloja en una plataforma que sirve de soporte, dicho soporte para las velas está dado por la ubicación de uno o varios recipientes plásticos dentro de las velas, del cual el cierre con la tapa junto a la rosca del mismo sirve para sostener la vela en la plataforma y la base con un orificio para sostener la lámpara eléctrica.
2. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dicho gabinete puede tomar la forma de media semiesfera sin base de soporte.
3. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dicho gabinete puede tomar la forma de un cuarto de semiesfera sin base de soporte.
4. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dichas laminillas se configuran en series de separación con respecto a las ranuras de m a n ranuras que forman una circunferencia, donde m laminillas es un entero de 1 hasta 5 y n ranuras es un entero de 0 hasta 3.
5. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1,4, donde dichas laminillas ubicadas en el gabinete con respecto a las laminillas ubicadas en las velas mantienen una relación de 1 a 1.
6. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1,4,5 donde dichas laminillas ubicadas en el gabinete alojan en su parte inferior un sensor al tacto para ser activado con el dedo al contacto con el mismo.
7. Sistema de velas temporizadas, con emisión de sonido, operado con monedas, de acuerdo a la reivindicación 1, donde dichas velas configuradas está determinado por p cantidad de grupos, donde p es un número entero de 1 hasta 9.
8. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7, donde dichos grupos conformados por un número determinado de

velas está dado por q velas, donde q es un número entero múltiplo de 3; desde 3 hasta 84.

9. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7,8, donde dicha disposición de las velas puede estar dada desde el borde interno central de la plataforma del gabinete de forma media semiesfera, hacia fuera de mayor a menor en diferentes tamaños, una o varias formas y grosores, donde todas dan la apariencia de un cono truncado.

10. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7,8 donde dicha disposición de las velas puede estar dada desde el borde interno central de la plataforma del gabinete de forma media semiesfera, hacia fuera de mayor a menor en diferentes tamaños, una forma y grosor donde todas dan la apariencia de una cascada.

11. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1,7,8, donde dicha disposición de las velas puede estar dada desde la unión de los dos bordes internos de la plataforma del gabinete de forma un cuarto de semiesfera, hacia fuera de mayor a menor en diferentes tamaños, una o varias formas y grosores donde todas dan la apariencia de un cono truncado.

12. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 1, donde dicho soporte de la vela en la plataforma está dado por la rosca del recipiente plástico incrustado en ella, atravesando un orificio en la misma y del cual el cierre con la tapa y una arandela plástica (producto de abrir un orificio en la base de otro recipiente) contra las roscas aseguran la posición de la misma.

13. Sistema de velas temporizadas, con emisión de sonido, operado con monedas caracterizado por su forma de operación dada por una serie de eventos, tales como depósito de monedas por una o varias ranuras receptoras; selección de una o varias velas haciendo contacto con un dedo en el sensor al tacto ubicado en las laminillas del gabinete; encendido o acumulado de periodos de temporización de una o varias velas; y emisión o acumulado de sonido (voz y/o música) en forma de mensajes, transmitidos de uno en uno en forma secuencial. La combinación de estos eventos se hace sobre la descripción de una función, dicha función permite la operatividad del sistema.

14. Sistema de velas temporizadas con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de una vela temporizada en un periodo de tiempo determinado depositando una moneda por una ranura de acceso de entrada de monedas, seleccionando una laminilla en el gabinete correspondiente a la vela deseada y haciendo contacto con un dedo en un sensor al tacto, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes.

15. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de una vela temporizada en uno o varios periodos cuando la configuración de las laminillas en el gabinete con respecto a las ranuras es de 1 a 1. Se deposita monedas por la ranura correspondiente a la laminilla de la vela deseada se enciende la vela y a su vez se da una emisión de sonido en forma de mensaje. El sensor en la

laminilla se utiliza para el acumulado de x periodos de temporización de encendido de la vela haciendo contacto en el mismo tantas veces como monedas se hayan depositado.

16. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de una vela temporizada en varios periodos de tiempo, depositando monedas por una o varias ranuras de acceso para la entrada de monedas, seleccionando una laminilla en el gabinete correspondiente a la vela deseada haciendo contacto en un sensor al tacto, a su vez se da una emisión de sonido (voz o música) en forma de mensajes.

17. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el encendido de varias velas temporizadas en un periodo de tiempo, depositando monedas por una ranura de acceso de entradas de monedas, seleccionando varias laminillas en el gabinete correspondiente a las velas deseadas haciendo contacto en un sensor al tacto, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes.

18. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para el encendido de varias velas temporizadas en varios periodos de tiempo, depositando monedas por varias ranuras de acceso de entrada de monedas, seleccionando varias laminillas en el gabinete correspondiente a las velas deseadas haciendo contacto en un sensor al tacto tantas veces igual al número de monedas depositadas, a su vez se da una emisión de sonido (voz y/o música) en forma de mensajes.

19. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función está dada para cuando se alcanza una condición igual o mayor de periodos de tiempo acumulados en una vela, seleccionando una laminilla en el gabinete correspondiente a la vela deseada se hace contacto en un sensor al tacto tantas veces hasta alcanzar el tope mínimo predeterminado a su vez se da una emisión de sonido (Voz y/o música), una serie de mensajes predeterminados en forma secuencial.

20. Sistema de velas temporizadas, con emisión de sonido , operado con monedas de acuerdo a la reivindicación 13,14,15,16,17,18,19, donde dicha función está dada para cuando todas las velas del sistema se encuentran encendidas y no hay emisión de sonido, en el momento de asesar al sistema, donde se podrá actuar en cualquiera de las funciones anteriores, la diferencia está en que los periodos de encendidos de las velas se acumulan por mas tiempo, a su vez se da la emisión de sonido (Voz y/o música) en forma de mensajes, uno detrás del otro.

21. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13,14,15,16,17,18,19,20, donde dicha función está dada para cuando todas las velas del sistema se encuentran encendidas y hay emisión de sonido en el momento de acceder al sistema, donde se podrá actuar en cualquiera de las funciones anteriores, la diferencia está en que los periodos de encendido de las velas se acumularan por mas tiempo lo mismo que los mensajes de sonido (Voz y/o música) llevándose a una cola de espera para

luego ser emitidos en forma secuencial.

22. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el ajuste del periodo de temporización de la vela presionando un switch de regulación correspondiente a distintos valores predeterminados de incremento de periodos de temporización.

23. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el acumulado o cambio de nuevos mensajes para el sistema de velas vía internet accediendo a una dirección correspondiente a la pagina web.

24. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 13, donde dicha función esta dada para el diagnóstico de operación del sistema accionando un switch que está determinado para ello o accediendo a una dirección de la web.

25. Sistema de velas temporizadas, con emisión de sonido, operado con monedas caracterizado por el método para la fabricación de la vela en parafina para el sistema, que comprende un molde que tiene una pared lateral sustancialmente circular cerrado en el extremo inferior de la base. La base tiene una porción de cuerpo que se soporta sobre una superficie plana. Extendiéndose desde la base se encuentra una pared de transición dicha pared de transición termina en la pared de soporte, que sirve para sostener por la parte interna de la misma uno o varios recipientes plásticos, dichos recipientes plásticos están colocados en arreglo, sostenido a su vez por la base del mismo permitiendo así obtener velas en todos los tamaños y grosores.

26. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25, donde dicha pared de transición interna del molde que se extiende hacia arriba tiene por lo menos la altura de una lámpara eléctrica.

27. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de un recipiente plástico quedando la rosca del mismo hacia fuera del molde y la base como soporte de la lámpara eléctrica.

28. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de dos recipientes unidos por sus dos bases quedando una rosca de los mismos hacia fuera del molde, y una base sobre la pared de soporte del molde.

29. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de varios recipientes plásticos unidos por sus caras quedando las roscas de los mismos hacia fuera del molde.

30. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde dichos recipientes pueden tener un arreglo de apilado quedando el pico de vertido de un primer recipiente haciendo contacto con la base de un segundo recipiente.

31. Sistema de velas temporizadas, con emisión de sonido, operado con monedas de acuerdo a la reivindicación 25,26, donde el procedimiento a seguir para fabricar la vela para el sistema es aplicar desmoldante en la parte interna de un molde de tamaño, forma y grosor de la vela deseada, y ubicar en el interior del molde un arreglo de recipientes previamente determinados con un refrigerante en su interior.

El siguiente paso es colocar parafina en un recipiente, introducirla dentro de una vasija y llevarla a baño de María, calentar hasta que la parafina se funda. Agregar el tinte deseado. Cuando la parafina alcance aproximadamente 343 grados Kelvin volcarla en el molde que contiene el arreglo de recipientes plásticos hasta alcanzar la parte final del reborde de proyección circundante de los mismos. Dejar solidificar y enfriar, finalmente desmoldar.

Enseguida se abre un orificio en el centro de la base del envase que quedó ubicado dentro de la parafina, la arandela resultado de esta operación se ubica en el interior de un zócalo, se le abre un pequeño orificio en el centro y por allí se hace pasar un remache para que sea un electrodo de la lámpara que se ajusta en él, se hace la conexión eléctrica soldando los cables al zócalo y se saca por la rosca del recipiente en la parte baja del cuerpo de la vela de parafina.

RESUMEN

Sistema de velas (1) temporizadas, provisto de un gabinete (2) subdividido en partes dependiendo de la configuración en grupos de un conjunto de velas dispuestas en una plataforma desde el centro de la misma hacia fuera, en diferentes tamaños (15) una o varias formas y grosores identificadas cada una para su encendido por una laminilla (7) que contiene una figura y que corresponde a otra igual (8) ubicada en el gabinete (2). También soporta una configuración de laminillas (6) y ranuras (12) de entrada de monedas predeterminada por una relación formando todas entre sí una circunferencia. Se caracteriza por la forma de operar el sistema dado por una serie de funciones que permiten encender las velas por medio de sensores al tacto (10) a su vez emitir sonido en forma de mensajes. El método utilizado para fabricar la vela (9) en parafina con lámpara (31) para el sistema (1) parte de un molde (36) que aloja un arreglo de recipientes plásticos en su interior.

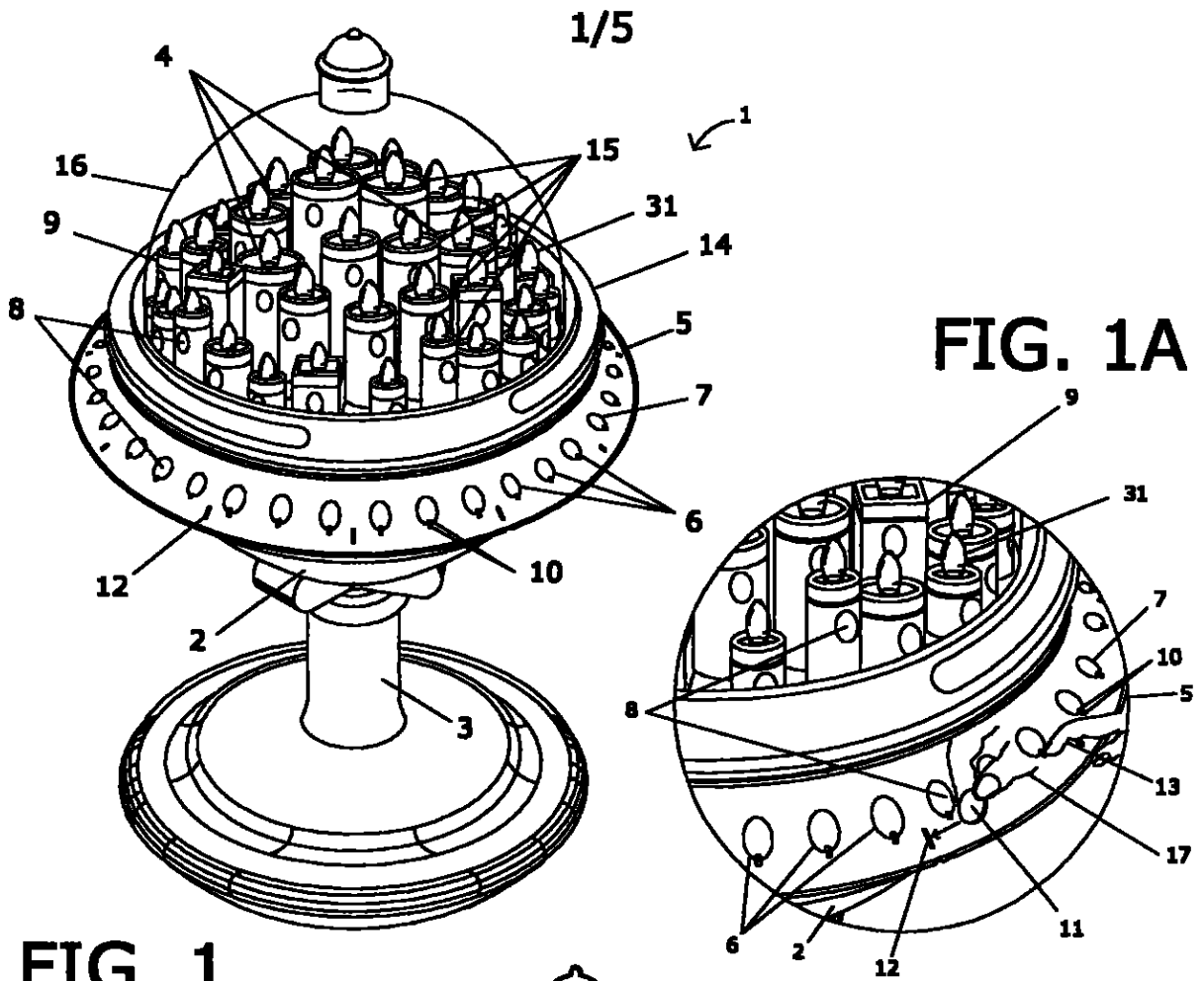


FIG. 1

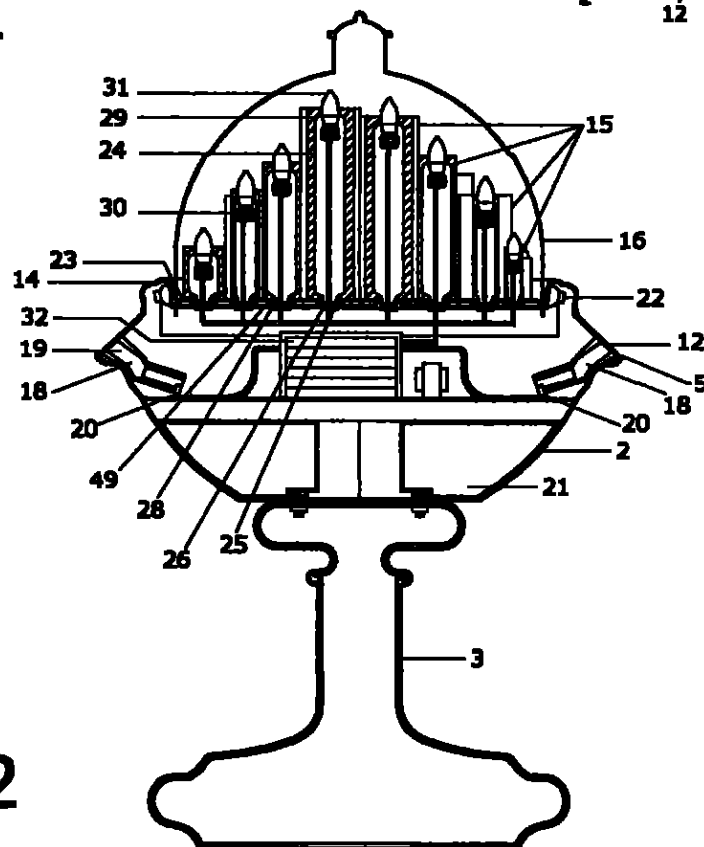


FIG. 2

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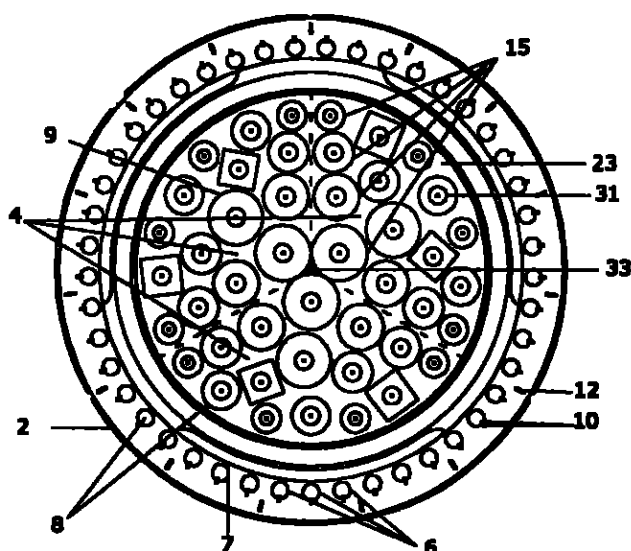


FIG. 3

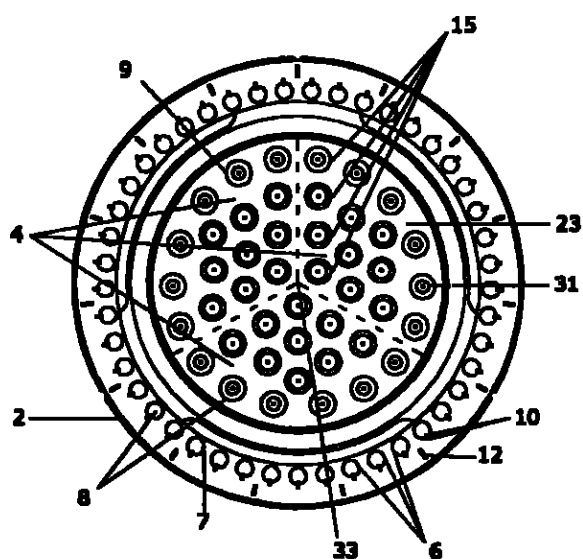


FIG. 4

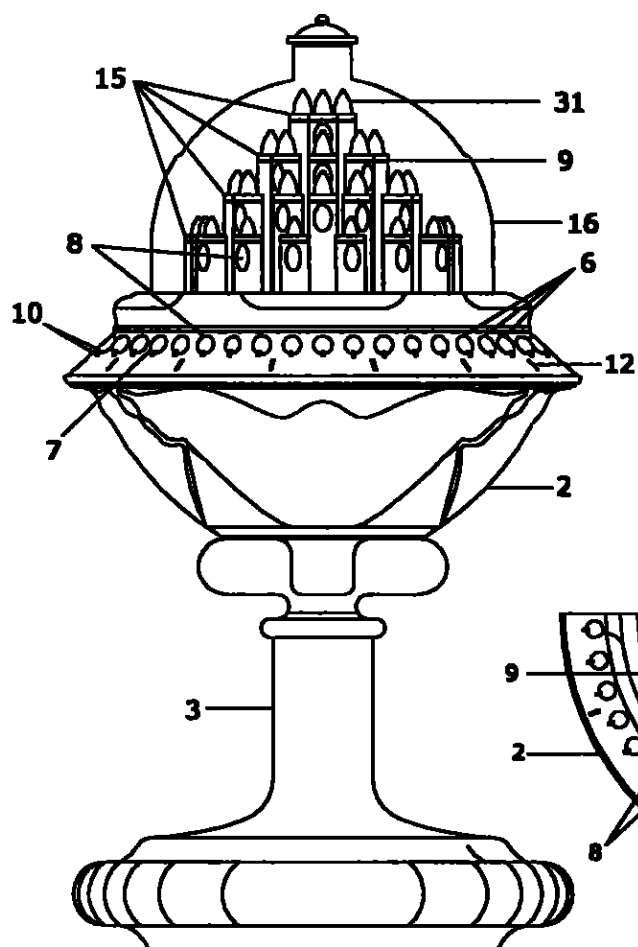


FIG. 4A

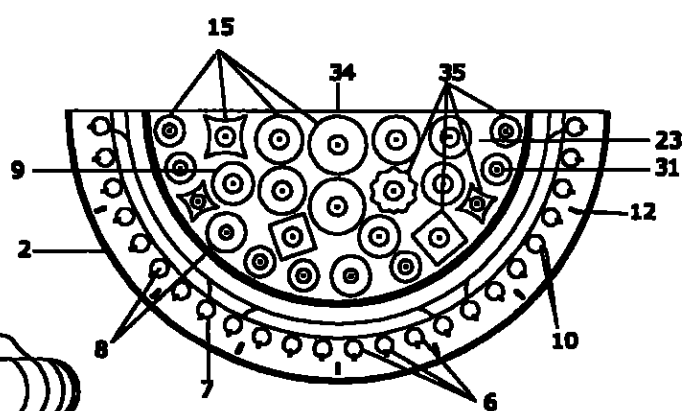


FIG. 5

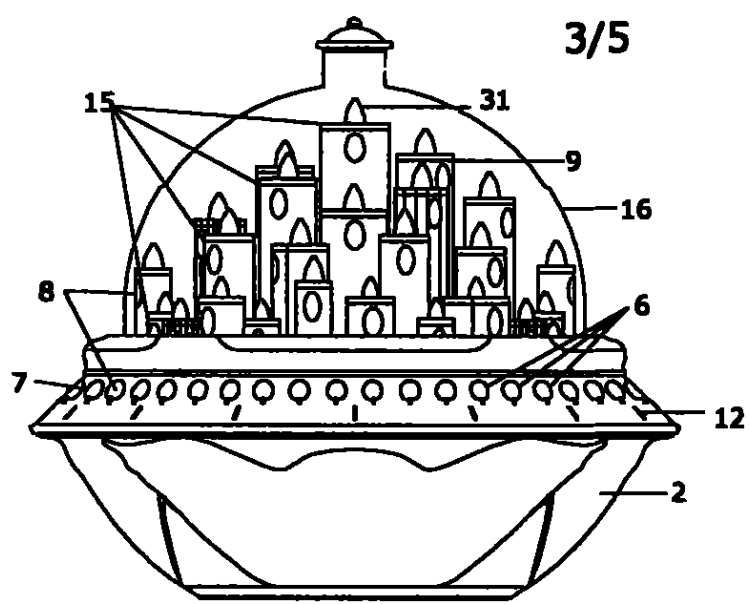


FIG. 5A

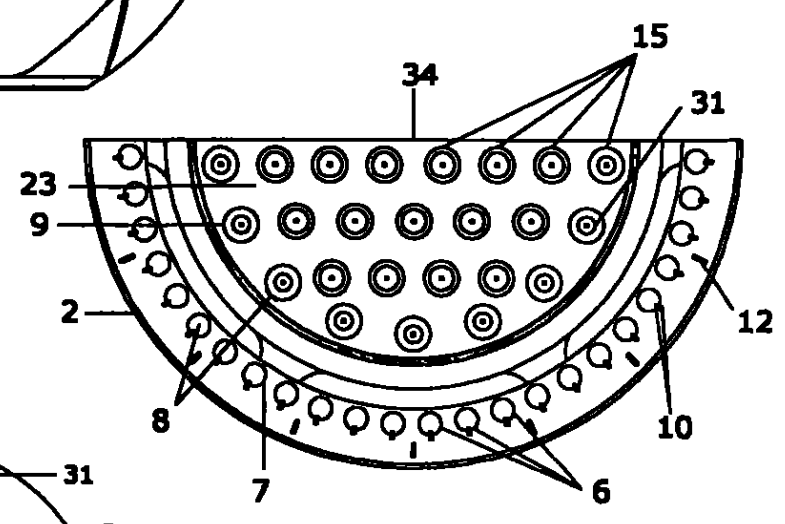


FIG. 6

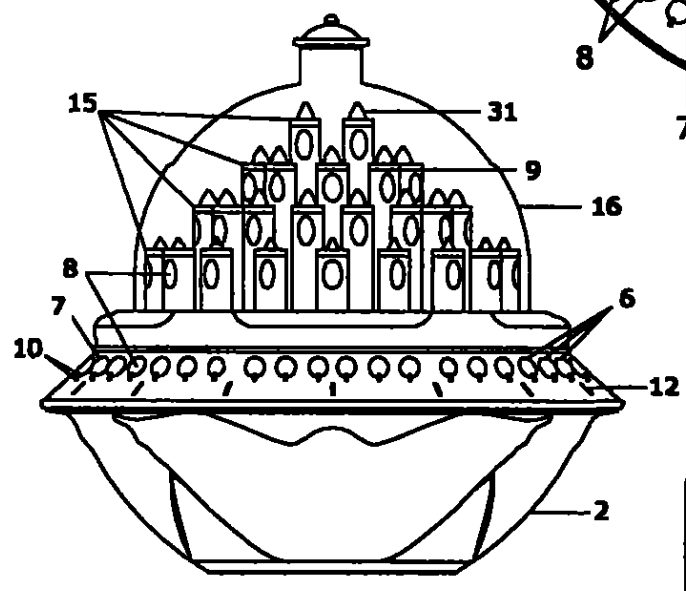


FIG. 6A

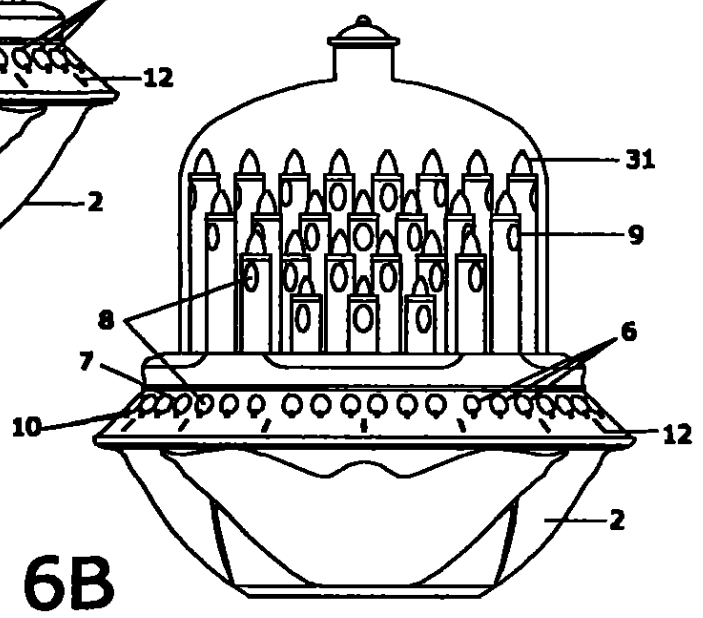


FIG. 6B

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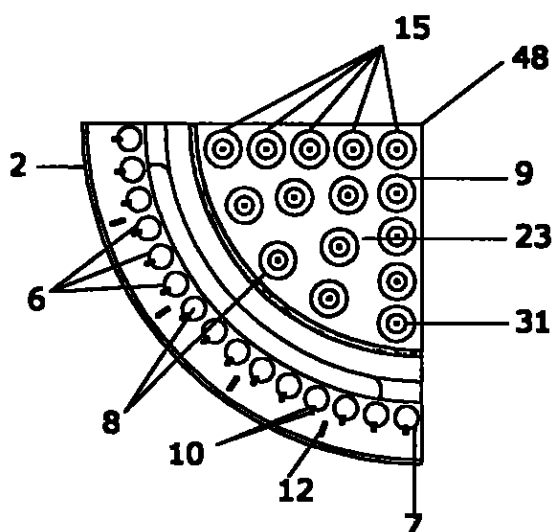


FIG. 7

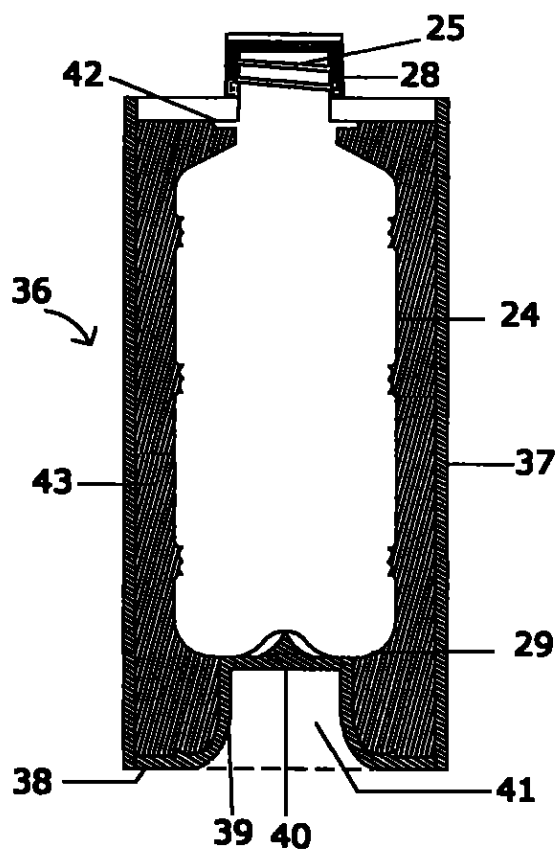


FIG. 8

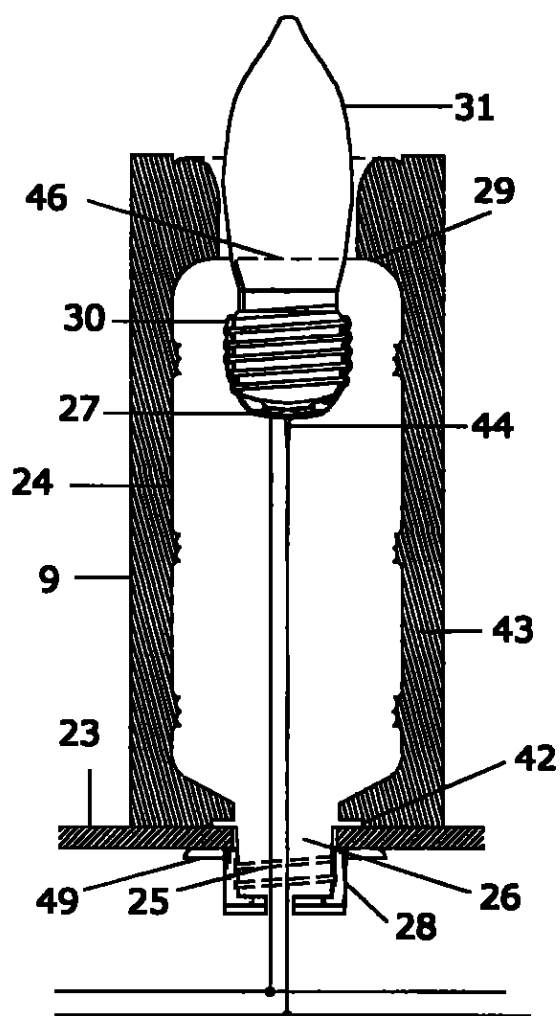


FIG. 9

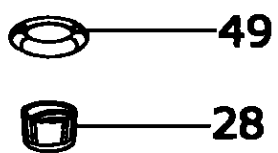
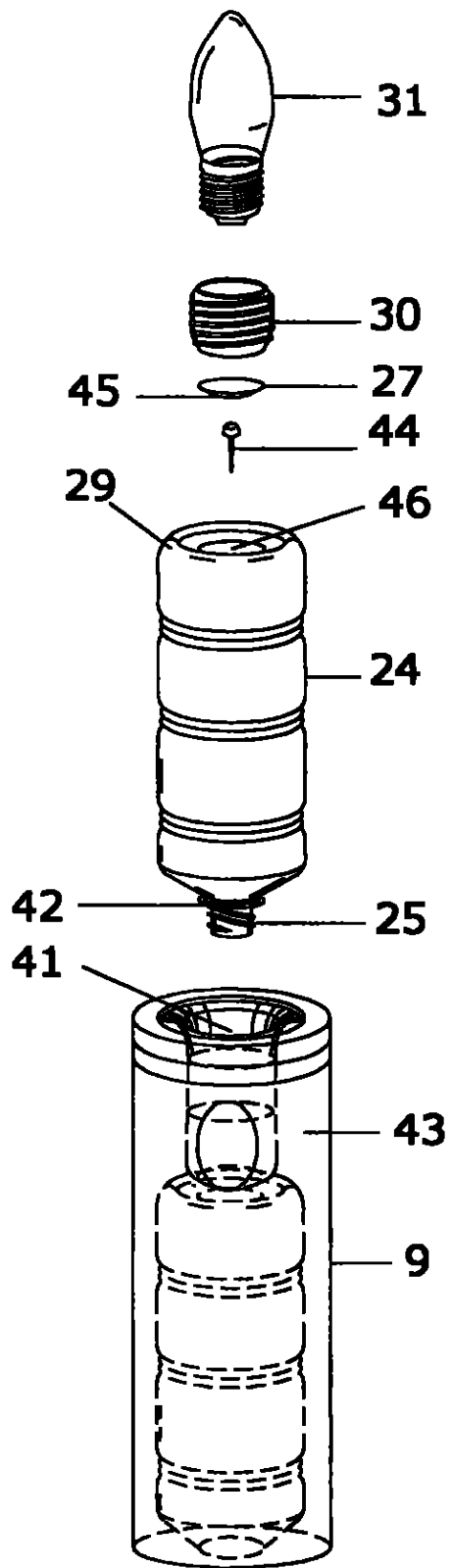


FIG. 10

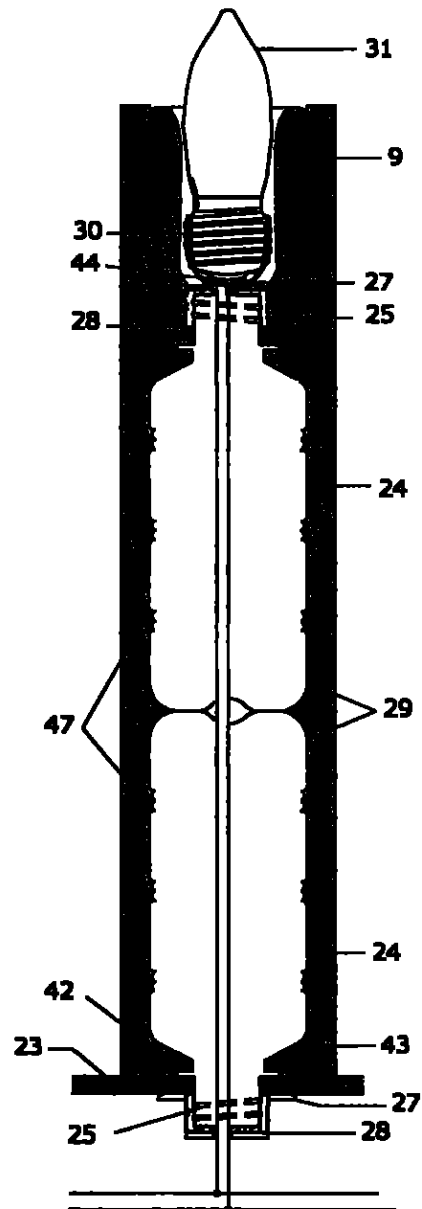


FIG. 11

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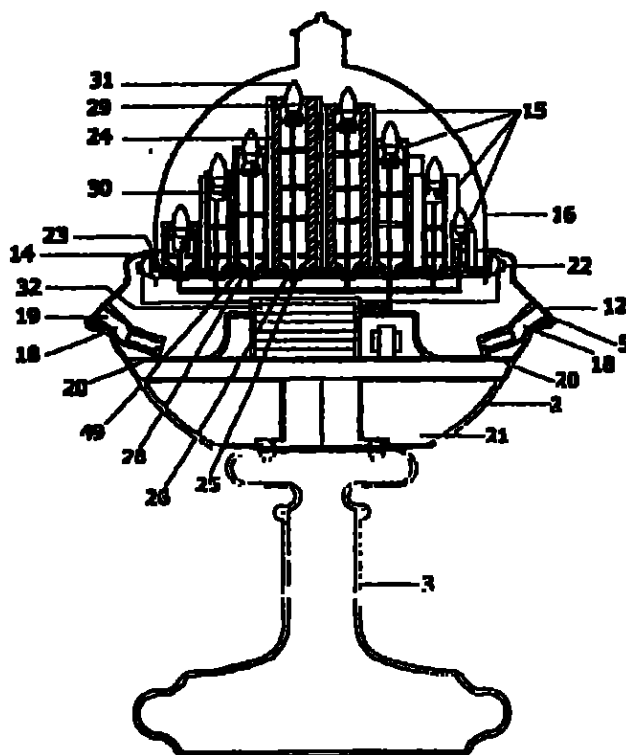
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[Continúa en la página siguiente]

(54) Title: COIN-OPERATED SOUND-PRODUCING TIME-CONTROLLED CANDLE SYSTEM AND METHOD FOR THE PRODUCTION OF SAID CANDLE

(54) Título: SISTEMA DE VELAS TEMPORIZADAS, CON SONIDO Y OPERADO CON MONEDAS. Y METODO DE FABRICACION DE LA VELA



(57) Abstract: A time-controlled candle system (1) provided with a housing (2) subdivided into parts depending on the group-like configuration of a set of candles disposed on a platform from the centre of the same in an outward direction, according to different sizes (15), one or various forms and thicknesses, each of which is identified for lighting by means of a small plate (7) containing a figure and corresponding to another identical plate (8) placed in the housing (2). The invention also relates to a configuration of small plates (6) and grooves (12) for the admission of coins which is predetermined by means of a ratio forming a circumference. The invention is characterized by the manner in which the given system is operated for a series of functions enabling the candles to be lit, using touch sensors (10), and enabling sounds to be produced in the form of messages. The method used for the production of said candle (9) made of paraffin, including a lamp (31) for the system (1), is based on a mould (36) housing an arrangement of plastic containers in the inside thereof.

(57) Resumen: Sistema de velas (1) temporizadas, provisto de un gabinete (2) subdividido en partes dependiendo de la configuración en grupos de un conjunto de velas dispuestas en una plataforma desde el centro de la misma hacia fuera, en diferentes tamaños (15) una o varias formas y grosores identificadas cada una para su encendido por una laminilla (7) que contiene una figura y corresponde

[Continúa en la página siguiente]

WO 03/084375 A1

TRATADO DE COOPERACIÓN EN MATERIA DE PATENTES

PCT

INFORME DE BÚSQUEDA INTERNACIONAL

(Artículo 18 y reglas 43 y 44 del PCT)

54

Referencia del expediente del solicitante o del mandatario	PARA CONTINUAR LA TRAMITACIÓN ver la notificación de transmisión del informe de búsqueda internacional (Formulario PCT/ISA/220) y, en su caso, el punto 5 de esta hoja.	
Solicitud internacional n° PCT/IB/02/02077	Fecha de presentación internacional (día/mes/año) 04/04/2002	Fecha de prioridad (la más antigua) (día/mes/año)
Solicitante URIBE SAUZA, JOSE JOAQUIN		

El presente informe de búsqueda internacional, elaborado por esta Administración encargada de la Búsqueda Internacional, se transmite al solicitante, conforme al artículo 18. Se remite una copia del mismo a la Oficina Internacional.

Este informe de búsqueda internacional comprende un total de 4 hojas.

☒ Se adjunta una copia de cada uno de los documentos citados en el informe relativos al estado de la técnica.

1. Consideraciones sobre el informe

a. En lo que se refiere al idioma, la búsqueda internacional se ha realizado sobre la solicitud internacional en el idioma en el cual se depositó, salvo indicación en contra señalada en este apartado.

☐ la búsqueda internacional se ha realizado sobre una traducción de la solicitud internacional facilitada a esta Administración (Regla 23.1 b)).

b. En lo que se refiere a las secuencias de nucleótidos y/o de aminoácidos divulgadas en la solicitud internacional (en su caso), la búsqueda internacional se ha basado en la lista de secuencias:

☐ contenida en la solicitud internacional en formato escrito.

☐ presentada conjuntamente con la solicitud internacional en soporte legible por ordenador.

☐ facilitada posteriormente a esta Administración por escrito.

☐ facilitada posteriormente a esta Administración en soporte legible por ordenador.

☐ se ha entregado la declaración, según la cual la lista de secuencias presentada por escrito posteriormente no va más allá de la divulgación hecha en la solicitud internacional tal y como fue presentada.

☐ se ha entregado la declaración, según la cual la información grabada en el soporte legible por ordenador es idéntica a la lista de secuencias presentada por escrito.

2. ☐ Se estima que algunas reivindicaciones no pueden ser objeto de búsqueda (ver recuadro I).

3. ☐ Falta unidad de invención (ver recuadro II).

4. Con respecto al título,

☒ el texto se aprueba según fue remitido por el solicitante.

☐ el texto ha sido establecido por esta Administración con la siguiente redacción:

5. Con respecto al resumen,

☒ el texto se aprueba según fue remitido por el solicitante.

☐ el texto (reproducido en el recuadro III) ha sido establecido por esta Administración de conformidad con la regla 38.2b). El solicitante puede presentar observaciones a esta Administración en el plazo de un mes a contar desde la fecha de expedición del presente informe de búsqueda internacional.

6. La figura de los dibujos a publicar junto con el resumen es la siguiente: Figura n° 2

☐ propuesta por el solicitante.

☐ No debe publicarse ninguna figura

☐ por no haber propuesto el solicitante ninguna figura.

☒ por caracterizar mejor, esta figura, la invención.

A. CLASIFICACIÓN DEL OBJETO DE LA SOLICITUD

CIP⁷ A47G33/00

De acuerdo con la Clasificación Internacional de Patentes (CII⁹) o según la clasificación nacional y la CIP.

B. SECTORES COMPRENDIDOS POR LA BÚSQUEDA

Documentación mínima consultada (sistema de clasificación, seguido de los símbolos de clasificación)

CIP⁷ A47G33/00, 33/02; H05B37/00, 37/02; G07F15/12, 17/30; F21V35/00

Otra documentación consultada, además de la documentación mínima, en la medida en que tales documentos formen parte de los sectores comprendidos por la búsqueda

Bases de datos electrónicas consultadas durante la búsqueda internacional (nombre de la base de datos y, si es posible, términos de búsqueda utilizados)

WPI, EPODOC, CIBEPAT, . PAJ

C. DOCUMENTOS CONSIDERADOS RELEVANTES

Categoría*	Documentos citados, con indicación, si procede, de las partes relevantes	Relevante para las reivindicaciones n°
A	US 4492896 A (GRAHAM A.) 08/01/1985 columna 2, línea 67 - columna 3, línea 68; figuras 1,3,4	1-22
A	US 4675578 A (MITCHELL M. et Al.) 23/06/1987 resumen; figuras 1,2	1-22
A	US 4177407 A (HAROLD G. et Al) 04/12/1979 columna 2, línea 60 -columna 4, línea 47; figuras 1,2	1-22
A	GB 2184943 A (VOLKER HASSLER) 8/07/1987 resumen; figuras 1, 3	1-22
A	US 2897300 A (KING A.) 28/07/1959 columna 2, línea 67 - columna 3, línea 7; figura 1	1-22
A	US 2658168 A (MATSON L.) 03/11/1953 columna 2, líneas 37-55; figura 1	1-22

☒ En la continuación del recuadro C se relacionan otros documentos

☒ Los documentos de familia de patentes se indican en el anexo

* Categorías especiales de documentos citados:

"A" documento que define el estado general de la técnica no considerado como particularmente relevante.

"I" artículo de patente o patente anterior pero publicada en la fecha de presentación internacional o en fecha posterior.

"L" documento que puede plantear dudas sobre una reivindicación de prioridad o que se cita para determinar la fecha de publicación de otra cita o por una razón especial (como la indicada).

"O" documento que se refiere a una divulgación oral, a una utilización, a una exposición o a cualquier otro medio.

"P" documento publicado antes de la fecha de presentación internacional pero con posterioridad a la fecha de prioridad reivindicada.

"T" documento ulterior publicado con posterioridad a la fecha de presentación internacional o de prioridad que no pertenece al estado de la técnica pertinente pero que se cita por permitir la comprensión del principio o teoría que constituye la base de la invención.

"X" documento particularmente relevante; la invención reivindicada no puede considerarse nueva o que implique una actividad inventiva por referencia al documento aisladamente considerado.

"Y" documento particularmente relevante; la invención reivindicada no puede considerarse que implique una actividad inventiva cuando el documento se asocia a otro u otros documentos de la misma naturaleza, cuya combinación resulta evidente para un experto en la materia.

"&" documento que forma parte de la misma familia de patentes.

Fecha en que se ha concluido efectivamente la búsqueda internacional.

04/09/2002

Fecha de expedición del informe de búsqueda internacional

16 SEP 2002 16. 09. 02

Nombre y dirección postal de la Administración encargada de la búsqueda internacional

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INFORME DE BÚSQUEDA INTERNACIONAL
Información relativa a miembros de familias de patentes

Solicitud internacional n°

PCT/IB/02/02077

Documento de patente citado en el informe de búsqueda	Fecha de publicación	Miembro(s) de la familia de patentes	Fecha de publicación
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C (Continuación). DOCUMENTOS CONSIDERADOS RELEVANTES

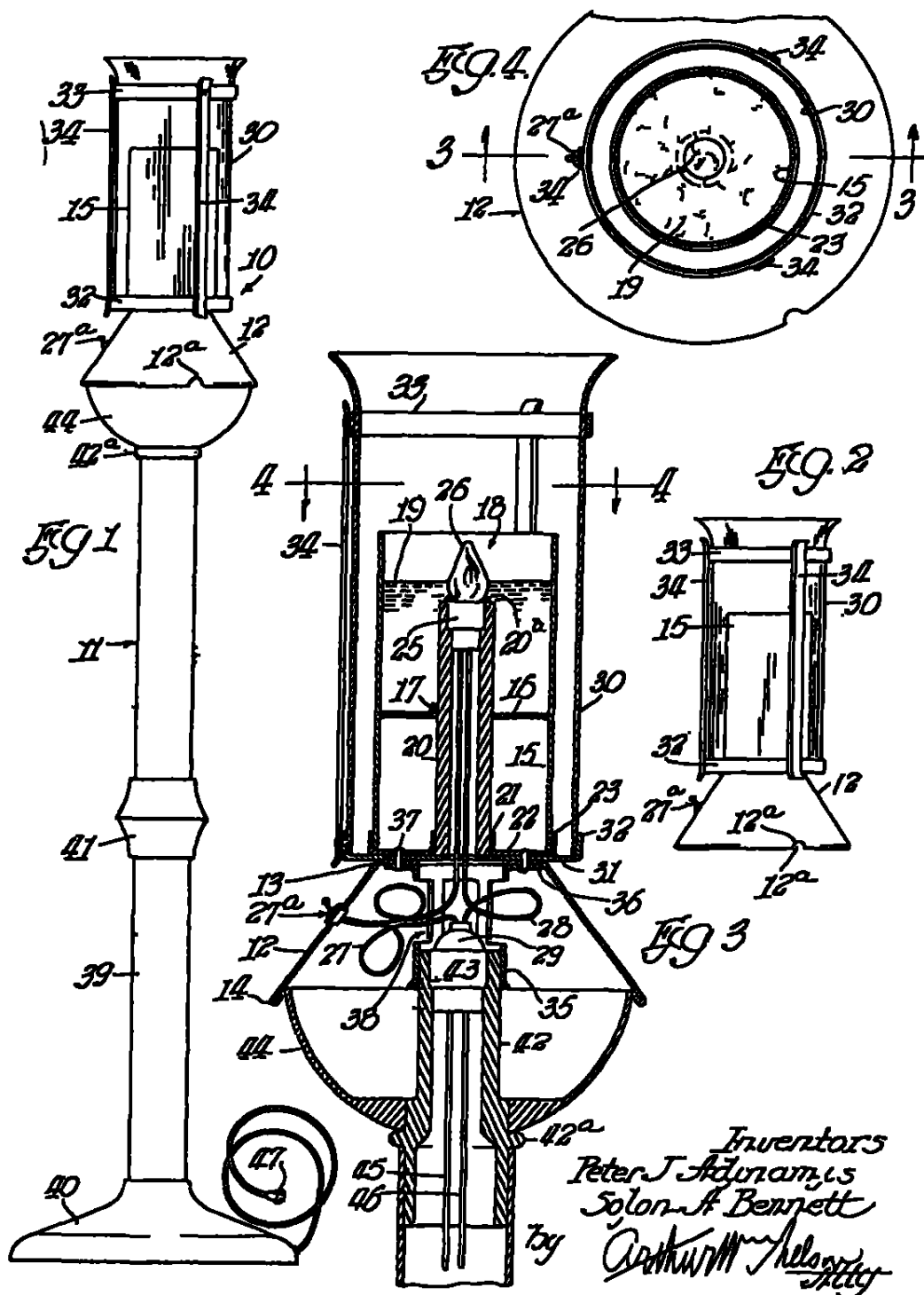
Categoría*	Documentos citados, con indicación, si procede, de las partes relevantes	Relevante para las reivindicaciones n°
A	US 2034744 A (CAMPAGNA et AL.) 24/03/1936 figuras 1-7	1-22
A	FR 2757927 A (GUE ETIENNE) 03/07/1998 resumen ; figura 1	25-31
A	US 2532800 A (ADINAMIS P. et AL.) 05/12/1950 figura 3	25-31

Dec. 5, 1950

P J ADINAMIS ET AL
LIGHT FIXTURE

2 532,800

Filed Dec 17 1947



Inventors
Peter J. Adinamis
Solon A. Bennett
by *Arthur W. Helgeson*

UNITED STATES PATENT OFFICE

2,532,800

LIGHT FIXTURE

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Chicago, Ill.

Application December 17 1947 Serial No. 793 180

3 Claims. (Cl. 219-45)

1

This invention relates to improvements in light fixtures and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

One of the objects of the present invention is to provide a light fixture that may be used as a decorative or a vigil light for churches, funeral establishments and in the home and other places and which is so constructed as to simulate a burning candle type of light.

Another object of the invention is to provide a fixture of this kind which may be used either as a floor or torchère model or as a wall or table model and which in any instance affords a decorative appearance and while simulating a burning candle eliminates the fire hazard thereof along with the inconvenience of replacing candles and lighting the same.

A further object of the invention is to provide a fixture of this kind which includes a supporting standard and an electrically illuminated light unit, the standard and the unit being so constructed that the unit may be supported on the standard for use as a floor lamp or torchère or may be removed therefrom and used as a wall or table lamp, without the necessity of manipulating any parts to provide a base therefor.

The above mentioned objects of the invention along with others as well as the advantages thereof will more fully appear as the specification proceeds.

In the drawings

Fig. 1 is a view in side elevation of the improved light fixture when the light unit thereof is supported upon the upper end of a standard to afford a floor model or torchère.

Fig. 2 is a view in side elevation on the scale of Fig. 1 of the light unit of the fixture when removed from the standard for use as a wall or table model.

Fig. 3 is a vertical sectional view through parts of the fixture at the upper end of and on a scale enlarged over that of Fig. 1 as taken on the line 3-3 of Fig. 4.

Fig. 4 is a horizontal sectional view through a part of the light unit of the fixture as taken on the line 4-4 of Fig. 3.

In general the improved light fixture includes a light unit which has a base of such form that the unit may be used alone as a table or wall type or model of light, or it may be removably disposed upon the upper end of an upright standard or pedestal to be used as a floor model or torchère.

The unit includes a portion forming a con-

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tainer for a material which when heated is somewhat vaporizable of which wax is the preferred material. Associated with the portion is a clear glass commercial electric bulb with a filament resembling a candle flame when the filament is in an incandescent state. This bulb is so disposed with respect to the material as to illuminate and preferably to heat the same to such a state that it has the odor of burning candle wax. The unit further includes a shade and wiring for the bulb having a fitting for detachable connection with a conductor in the standard when the fixture is used as a floor model or with a conventional outlet of a source of current supply when the unit is used alone as a wall or table model.

Referring now in detail to that embodiment of the invention illustrated in the drawing the improved light fixture includes a light unit indicated as a whole at 10 and which in itself may be used as a wall lamp or a table lamp or may be detachably engaged upon the upper end of a standard or pedestal 11 to be used as a floor lamp or torchère.

The unit 10 includes a frusto conical or truncated base 12 having an inwardly extending radial top end flange 13 and a rolled bead bottom edge 14 of a diameter larger than that of its upper end and which forms a good stable non-scratching bottom for the base. Above and coaxial with the base is a hollow cylindrical member 15 preferably made of a transparent amber tinted material, of a diameter approximating the diameter of the top end of the base and between its ends said member is provided with a horizontal wall 16 having a central opening 17. The wall 16 which may be an integral part of the member 15 and that part of the member 15 extending above the same coact to provide a container 18 to receive a material 19 which when heated is somewhat vaporizable. Candle wax is mentioned as an example of such material.

Centrally in the member 15 is a rigid sleeve or tube 20 the bottom end of which is engaged in the upright annular inner flange 21 of a member 22 forming the bottom of said member 15. Said tube extends up through the opening 17 in the wall 16 and terminates below the level of the material 19 in the container 18. The member 22 has an upright outer annular flange 23 which receives the bottom end of the member 15. The upper end of the sleeve or tube 20 above receives a receptacle 5 for an electric lamp bulb 26, the largest diameter of which is disposed in the plane of the level of the material 19 and between said bulb and the top end of the tube 20 is a gasket

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20 of rubber or the like which prevents the entrance of the material into the open top end of the receptacle 25. Preferably this lamp has a clear glass bulb with a filament that resembles a candle flame when in incandescence. When in incandescence the lamp provides the source of illumination for the fixture and also heats the wax so that it has the odor typical of that produced by a burning wax candle.

The wax is softened by the heat of the lamp but it does not become so fluid as to leak or discharge through the opening 17.

In the sleeve 20 are located the wires 27 and 28 which lead downwardly from the receptacle and into the base 12 and wherein they are provided with sufficient slack and are connected to a plug 29 adapted for detachable engagement either with a companion socket of a conventional current outlet or with such a socket carried by the standard 11. A part of the slack of wire 27 has a switch 27 therein and which is carried by the base in a position for easy manipulation to control the lamp 26.

30 indicates a shade arranged in spaced surrounding relation with respect to the member 16. This shade is in the form of a cylinder of thin sheet material which may be either transparent or translucent. The open bottom end of the shade engages upon a bottom member 31 within an upright outer edge flange 32 thereon. Said member 31 is disposed below the member 22 and engages on the flange 13 of the base 12. The upper open end of said shade flares outwardly as appears in Figs 1, 2 and 3 and below the same is a surrounding annular band 33 and this band is connected by upright strips 34 with the flange 32 to provide a frame for the shade.

Within the base is a thin tubular pilot shell 35 having an outwardly extending radial flange 36 at the top disposed under the flange 13 of the base and these flanges and the members 22 and 31 are connected together as a unit by rivets or screws 37 that best appear in Fig 3. The bottom end of the shell stops short of the plane of the bead 14 of the base and the plug 9 before mentioned is disposed in this shell. The body of the pilot shell 35 is provided with openings 38 (see Fig 3) of such size that the plug 29 may be grasped by the fingers through said openings when it is desired to apply the same to or to remove the same from a socket in the upper end of the standard 11 and later mentioned in more detail.

When the plug 29 is applied to said socket and the switch 27 is manipulated to one position the lamp 26 will be energized and its heat will melt the wax in the container 18 and its light will illuminate the heated wax and the upper part of the light fixture.

The unit thus far described may be disposed with its base 12 in supporting relation upon a table or shelf. To accommodate the attachment of the wires 27, 28 with current supply conductors there is a recess 12 provided therefor in the bottom edge of the base 12.

The standard or pedestal 11 before mentioned includes a tubular upright 39 suitably fixed at its bottom end in a base 40 of substantial diameter for stability. When the upright 39 is made in two or more sections these sections may be connected together by means of a coupling 41.

A tubular fitting 42 has a shouldered bottom end engaged in the upper end of the upright 39 and the top end of said fitting is made to fit or telescope within the bottom end of the pilot

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shell 35 of the unit 10. In the top end of the fitting 42 is located a socket 43 with which the plug 29 before mentioned may be detachably connected. Surrounding the major upper portion of the fitting 42 and supported upon the shoulder 42 thereof is a bowl shaped member 44 the open top end of which is of such diameter as to fit within the bottom beaded end 14 of the base 12 of the unit 10 to provide a support therefor.

A pair of current conductors 45 and 46 are connected to the socket 43 and leads down through the fitting 42 and standard upright 39 and out through one side of the base 40 where they are provided with a plug 47 of such size as to fit with a suitable electric current supply outlet.

When the unit 10 is disposed upon the standard 11 the bottom end of the base 12 engages in supporting relation upon the upper edge of the bowl shaped member 44 at which time the upper end of the fitting 42 extends into the lower end of the pilot shell 35. This centers and firmly holds the unit 10 upon the standard 11 and provides the line of separation between the unit and the standard when the unit is to be removed from the upper end of the standard.

In operation the fixture simulates a burning candle vigil or other decorative light, suitable for use in churches, homes, funeral parlors and other places. The fixture eliminates the fire hazard of burning candles and the inconvenience of replacing candles and relighting them. By means of the fixture a decorative light for either table shelf or floor use is possible.

While in describing the invention we have referred in detail to the form arrangement and construction of the parts involved the same is to be considered only in the illustrative sense and therefore we do not wish to be limited thereto except as may be specifically set forth in the appended claims.

We claim as our invention

1. A light fixture simulating a burning candle and comprising a base an open top container of light transmittable material mounted on the base and forming a well a socket with its open end facing toward the open top of the container a light bulb in and extending above said socket and terminating at a level below the top of the container a heat vaporizable material within the well contacting the lower portion only of the bulb whereby the upper portion of the bulb remains exposed and current conducting means connected with the bulb whereby the bulb may be rendered incandescent thereby liquefying only the material adjacent the bulb.

2. A light fixture simulating a burning candle and comprising a base an open top container of light transmittable material mounted on the base and forming a well an upwardly opening socket positioned within and intermediate the ends of the well a light bulb in and extending above said socket and terminating at a level below the top of the container a heat vaporizable material within the well contacting the lower portion only of the bulb whereby the upper portion of the bulb remains exposed and current conducting means connected with the bulb whereby the bulb may be rendered incandescent thereby liquefying only the material adjacent the bulb.

3. A light fixture simulating a burning candle and comprising a base an open top container of light transmittable material mounted on the base and forming a well an upwardly opening socket means upstanding from the base and supporting the socket in a position within and intermediate the ends of the well a light bulb in and extend

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ing above said socket and terminating at a level below the top of the container a heat vaporisable material within the well contacting the lower portion only of the bulb whereby the upper portion of the bulb remains exposed and current conducting means connected with the bulb where by the bulb may be rendered incandescent there by liquefying only the material adjacent the bulb

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United States Patent [19]
Mitchell et al

[11] **Patent Number** **4,675,578**
 [45] **Date of Patent** **Jun 23 1987**

[54] **ELECTRIC VOTIVE LIGHT CONTROLLER**
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 Walter H Weber Toronto David R
 Stewart, Caledon East, both of
 Canada
 [73] **Assignee** Brighter Light Liturgical Furnishings,
 Inc., West Chester Pa.
 [21] **Appl No** 779 255
 [22] **Filed** Sep. 23, 1985
 [51] **Int. Cl.** H05B 37/00
 [52] **U.S. Cl.** 315/315 315/317
 315/361 315/362 315/312 362/810
 [58] **Field of Search** 315/316, 317 320, 361
 315/362 294 315 312 362/810
 [56] **References Cited**

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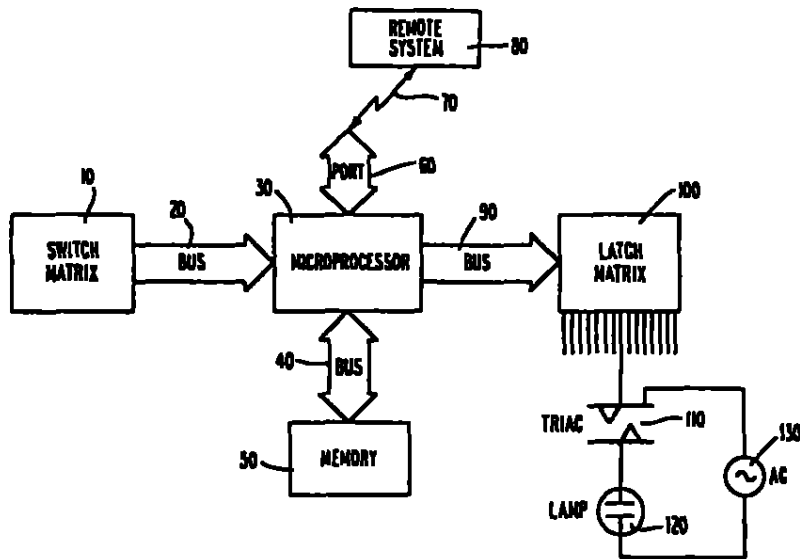
Elegance in Electric Candles by Automatic Votive
 Light Corp. 766-3rd Ave Brooklyn New York 11232

Primary Examiner—Harold Dixon
Attorney, Agent, or Firm—Ratner & Prestia

[57] **ABSTRACT**

A microprocessor based controller for electric liturgical
 lights similar to an array of votive candles including
 controllable duration of burn as well as selective
 actuation by the user in a variety of modes. The dura-
 tion of burn for all lights is controlled by a singular
 timer which is located within the stand supporting the
 array. Data indicative of the operational state of a light
 array may also be transferred to a remote light array for
 continuation of operation at the remote site.

6 Claims, 2 Drawing Figures



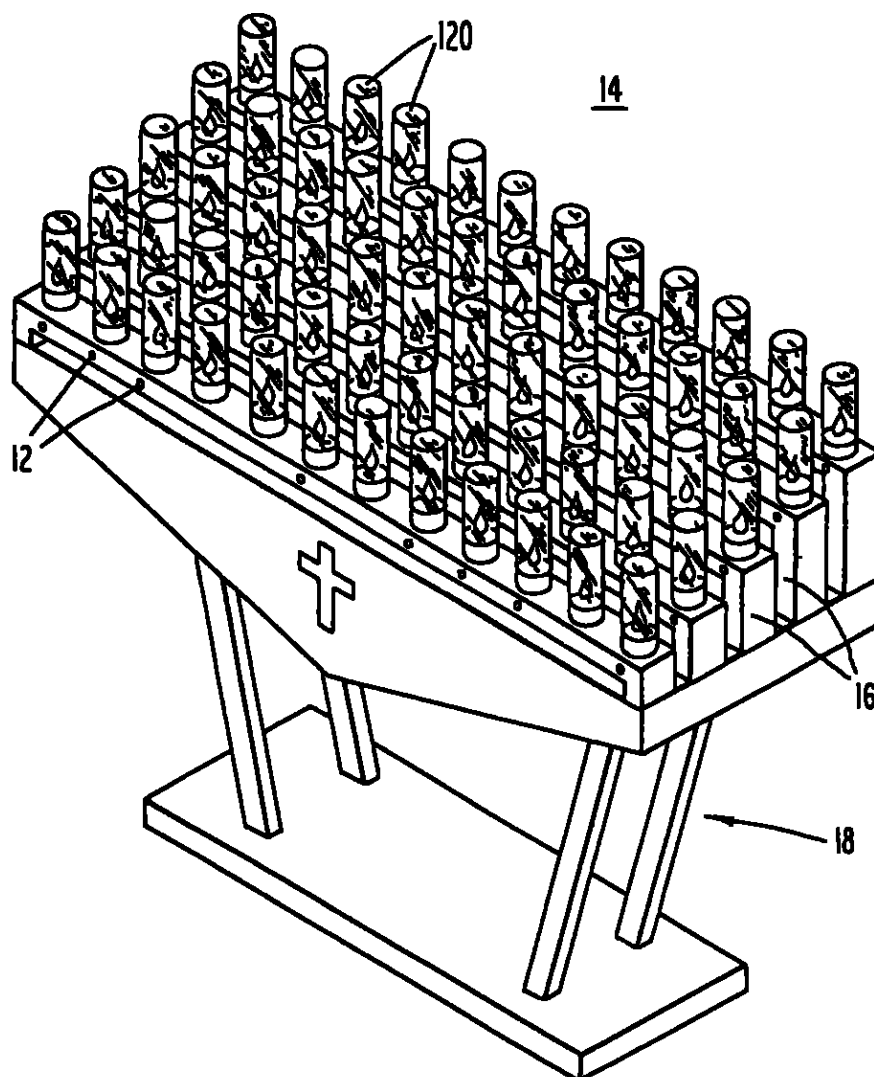


Fig 1

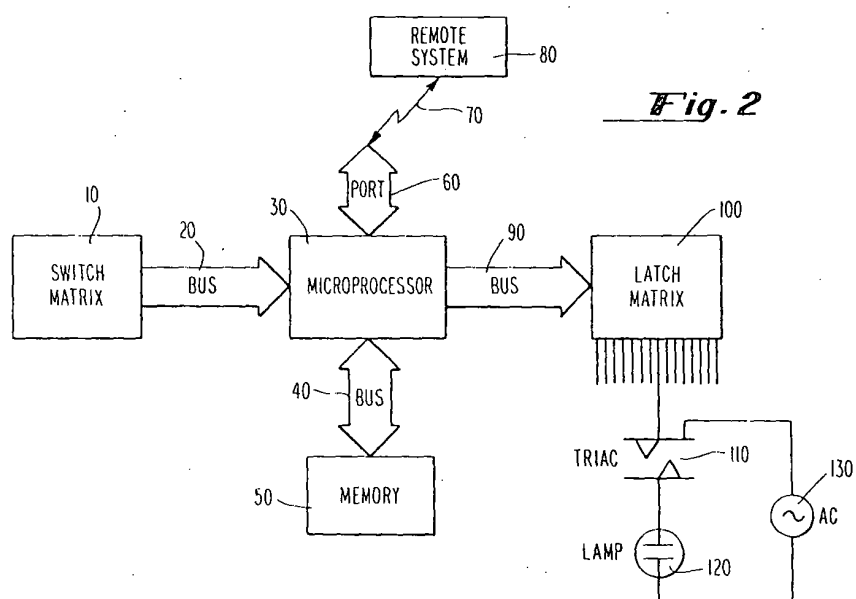


Fig. 2

ELECTRIC VOTIVE LIGHT CONTROLLER

BACKGROUND OF THE INVENTION

In many religious denominations, worshippers customarily light votive candles in honor or commemoration of certain festivals or events. Typically such candles burn for a predetermined duration and are displayed within the church on stands capable of holding an array of lit candles.

In many large religious institutions, multiple candle stands are employed in order to satisfy the needs of a great number of congregants. Commonly several large stands each containing more than fifty lit candles may be used simultaneously.

In recent years, several techniques have been employed to modernize the votive candle. Such devices as oil candles (which burn liquid oil and may be filled and maintained more easily and cheaply than the continued purchase of wax candles) have found favor in religious institutions. Even more recently electric light bulbs which simulate the yellow and flickering light of a candle have become popular.

Because electric light bulbs do not "burn down" like a candle, some method of controlling the duration of actuation of these light bulbs is needed. Typical of such a method is a mechanical timer which is set for a predetermined duration of burn and extinguishes the light bulb by actuation of a switch at the conclusion of that predetermined time interval. Such a mechanical timing device performs satisfactorily for locations where a uniform time of actuation is desirable. However most such systems are incapable of being actuated for precisely controlled variable periods. Such mechanical timers are also an integral part of a light stand and are subject to breakage which renders the stand inoperable.

Among the types of electric bulbs used in votive candle stands, the most desirable are neon "flicker flame" bulbs which operate from a 110 volt AC power source. Although low voltage candle type bulbs have been developed, these bulbs commonly fail to faithfully reproduce the light of a wax or oil candle flame as faithfully as the higher voltage bulbs. In systems employing low voltage electrical lights, control of such lights by electrical circuits using solid state timers is known. Such systems typically employ standard solid state timer components such as 555 type devices and are typically operable only for a single predetermined period of time. Such a timer device is started by the actuation of a switch associated with a particular lamp and begins to count down time from a predetermined level. Upon reaching zero such systems typically switch a power transistor in order to extinguish the particular light associated with a given timer chip.

Although such electronic systems are superior in function and reliability to prior mechanical systems, they still lack certain desirable features and fail to adequately simulate the light of a candle flame due to their use of low voltage bulbs.

SUMMARY OF THE INVENTION

A microprocessor based controller for high voltage electric liturgical lights similar to an array of votive candles including controllable duration of "burn" as well as selective actuation by the user in a variety of modes. The duration of burn for all lights is controlled by a singular timer which is located within the stand supporting the array. Data indicative of the operational

state of a light array may be transferred to a remote light array for continuation of operation at the remote site.

BRIEF DESCRIPTION OF THE FIGURES

FIG 1 shows the votive light system of the present invention.

FIG 2 is a block diagram of the electronic circuitry of the present invention.

BRIEF DESCRIPTION OF THE INVENTION

A self-contained microprocessor controlled electronic votive candle stand. All functions are controlled by a program operating on a microprocessor within the candle stand. A plurality of lights may be selectively actuated in accordance with the wishes of particular worshippers, who may actuate such lights in any of a plurality of different operating modes. A variable actuation period for all lights is controlled by a singular timing device implemented within the microprocessor. Data indicative of remaining burn time and associated with each of the plurality of lights may be transmitted or received by a separate votive candle stand in order to relocate the stand.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIG 1, electric votive light controller system 14 is shown supported by stand 18. Electric votive light controller system 14 includes an array of lamps 120 which may be arranged in the form of five rows 16 each containing twelve lamps 120. Corresponding to each lamp 120 there is a key switch 12 on the front of row 16. Each key switch 12 may be used to actuate its corresponding lamp 120 for a predetermined period of time.

Referring now to FIG 2, there is shown a block diagram of electric votive candle system 14 of the present invention. At the heart of this system is general purpose microprocessor 30 operating under control of a program which is stored in memory 50 connected to microprocessor 30 by way of bidirectional data and address bus 40.

Key switch matrix 10 which comprises a plurality of switches 12 is located on the front of rows 16 as previously described. Each switch 12 is associated with a single lamp 120 and is scanned by microprocessor 30 to determine the identity of an actuated switch. Key switch matrix 10 of five rows and twelve columns provides sixty uniquely addressable key switch locations, each location corresponding to a single switch 12. Thus each switch 12 is associated with a single lamp address which may include the row and column of the associated lamp 120. Lamps 120 of system 14 may be arranged other than in five rows and twelve columns. For example, lamps 120 may be arranged in six rows and ten columns. Key switch matrix 10 is arranged with the same number of rows and columns as lamps 120. The scanning of key switch matrix 10 is accomplished during the MAIN LOOP procedure of the control program.

To control the actuation of a plurality of lamps 120, microprocessor 30 communicates by bus 90 with a plurality of addressable latches in latch array 100. Each addressable latched bit is associated with a switch 12 and is connected to a triac 110 which controls the delivery of 110 volt AC power from AC current source

130 to the addressed lamp 120. Thus when a switch 12 is actuated the address of its associated lamp 120 is determined by microprocessor 30 and the corresponding latch in latch matrix 100 is addressed using bus 90. Lamp 120 is a neon flicker flame bulb. A single AC current source 130 may deliver power to a plurality of lamps 120.

FIG 2 depicts only one triac 110 and one lamp 120 connected to AC current source 130. In practice, each bit available in latch matrix 100 is connected to a corresponding triac 110 and lamp 120.

Microprocessor 30 is also provided with bidirectional I/O port 60 for communication with other devices such as remote system 80. Commonly bidirectional port 60 is connected by a pair of conductors to a similar port on remote system 80. Remote system 80 may be an identical votive candle stand or may be a general purpose microprocessor system of any desired type. Under control of a transfer initiation routine, microprocessor 30 may be directed to transmit information contained in memory 50 via communications link 70 to remote system 80. Information transferred via communications link 70 may include status data such as the designation of each lamp 120 which is lit and its remaining burn time.

The transmission of information occurs in a serial format which is verified for accuracy by the use of complementary data and strobe bits. Such transmission of data is controlled by the TRANSFER TX ROUTINE while data reception is controlled by the TRANSFER RX ROUTINE. See Appendix. TRANSFER TX ROUTINE and TRANSFER RX ROUTINE may be found in the Appendix which includes a complete pseudo-code listing of a program which may reside in memory 50 to implement the functions of system 14.

To prepare system 14 to receive a transmission, system 14 is turned off and then back on causing system 14 to enter an initialization mode. When system 14 is in the initialization mode the three leftmost lamps on the bottommost row 16 remain lit. The switch 12 corresponding to the third lit lamp is depressed causing the system to enter the receive mode. This switch 12 is thus the Receive switch. A Transmit switch (not shown) located on the underside of the transmitting system 14 is then depressed for three seconds. This causes the status data to be transmitted from the transmitting system to the receiving system.

After successful transmission of status data, all lamps 120 of the transmitting electric votive candle control system may be cleared by holding the Transmit switch in the depressed position for five seconds. This permits new data to be entered at switch matrix 10 of the transmitting system using individual switches 1. All data formerly contained within the transmitting control system is executed upon receipt by the receiving control system with no appreciable alteration of lamp burn durations. If the Transmit switch is depressed between three and five seconds the status information is transmitted to the receiving system but is not cleared from the sending system. Thus data is processed at both systems.

A predetermined duration of burn time may be programmed into system 14. To program system 14, power to system 14 is turned off and then turned on causing system 14 to enter the initialization mode. In the initialization mode all lamps 120 are lit for five seconds as a test. When the test period is over system 14 is programmed using the three leftmost switches 12 on the

bottommost row 16. The three leftmost lamps 120 corresponding to these three programming switches, remain lit after the test period to prompt the programmer. The leftmost switch 12 of bottommost row 16 may be used to program the number of days of burn time. System 14 inputs one day for each press of the leftmost switch 12. For example, if the burn duration is to be two days, then the leftmost switch 12 of the bottommost row 16 is pressed two times.

In a similar manner the second switch 12 from the left of bottommost row 16 is used to program the number of hours of burn duration. For example, if a burn duration of five hours is desired the second switch 12 from the left of bottommost row 16 is pressed five times.

When the days and hours of burn duration have been entered, the third switch 12 from the left on bottommost row 16 is used as a Set switch. Depressing this Set switch enters into the program of system 14 the number of days and hours indicated by depressing the two leftmost switches 12. Note that this Set switch is the same switch 12 which serves as the Receive switch when no program data is entered on the two leftmost switches 12.

System 14 may include an offering option. The system detects this automatically. When system 14 runs with the offering option installed a user must deposit an offering in an offering box (not shown) before making a candle selection. The presence of the offering box is detected automatically by system 14.

During programming of system 14 the top two rows 16 indicate the status of the programming. Starting from the left of the top row 16 one lamp 120 is lit for each day of burn time programmed. On the second row 16 from the top one lamp 120 is lit for each hour programmed.

System 14 may also operate in split mode. When system 14 operates in a split mode the lower two rows 16 and the upper three rows 16 may operate as independent systems in a manner similar to that previously described. The two independent subsystems thus formed may be programmed to have different burn times.

To program system 14 to operate in the split mode system 14 is placed in the initialization mode as previously described. The burn time for the lower system is selected using the two leftmost buttons of the bottommost row as previously described. The previously described Set switch is not depressed at this point. The burn time for the upper system is then selected by using the two leftmost switches 12 of the topmost row 16 in which the leftmost switch 12 of the topmost row 16 inputs the days of burn time of the upper system and the second switch 12 from the left inputs the hours of burn time of the upper system. The third button from the left of bottommost row 16 is then used as the Set switch which enters into the program of system 14 the burn times of the upper and lower systems.

In light controller system 14 the following components have been used for the operation and function as described and shown.

Reference Number	Component
30	MC68705U3
100	4042

The following is a listing for the firmware for memory 50. This listing carries out the operations of controller system 14 and is expressed in pseudo code.

APPENDIX

LCR PSEUDO CODE LISTINGS

These listings describe in functional detail the modules and subroutines used by the LCR computer

They have been written using standard procedures which are outlined at the end of this section

ROUTINE LIST

DEBUG ENTRY POINTS

RESET/START

CONFIGURE

TRANSFER TX ROUTINE

TRANSFER RX ROUTINE

ERROR RECOVERY ROUTINE

LIGHT INPUT ROUTINE (LIR)

TRANSFER REQUEST ROUTINE (TRR)

BURNTIME INPUT ROUTINE (BIR)

INPUT DECODE

MAIN LOOP

UPDATE

LATCH MODIFY

WRITE LATCH

INITIALIZATION

TIMERSW

PSEUDO CODE STANDARDS

DEBUG ENTRY POINTS

100 CALL RESET/START	PAGE 200
105 CALL CONFIGURE	PAGE 300
10A CALL TRANSFER TX ROUTINE	PAGE 400
10F CALL TRANSFER RX ROUTINE	PAGE 500
114 CALL LIGHT INPUT ROUTINE	PAGE 600
119 CALL TRANSFER REQUEST	PAGE 700
11E CALL BURNTIME INPUT	PAGE 800
123 CALL INPUT DECODE	PAGE 900
128 CALL MAIN LOOP	PAGE A00
12D CALL UPDATE	PAGE B00
132 CALL LATCH MODIFY	PAGE C00
137 CALL WRITE LATCH	PAGE D00
13C CALL INITIALIZATION	PAGE E00
141 CALL TIMERSW	PAGE F00

RESET/START

DISABLE INTERRUPT
CALL INITIALIZATION
START MAIN LOOP

CONFIGURE

SET ALL OF PORT C TO INPUTS
GET DATA FROM PORT C
PUT TEMPORARILY INTO CONFIG IN RAM
CLEAR BIT 6 AND 7 IN CONFIG
LOAD INDEX WITH CONFIG
SHIFT INDEX LEFT ARITHMETICALLY 3 TIMES
GET INITIAL CONFIGURATION FLAGS FROM ROM DIRECTED BY INDEX
PUT INTO CONFIG IN RAM
GET TIME CONTROL REGISTER INIT FROM RAM
PUT INTO TCR
SET PORT B BIT 0 TO AN INPUT
IF BIT 0 IS SET THEN
 SET UPDATE SELECT FLAG
ENDIF
RESET PORT B TO ALL OUTPUTS
RETURN

TRANSFER TX ROUTINE

GET DATA DELAY FROM ROM
PUT INTO TIMESW TO DETERMINE TRANSMIT DELAY
CALL TIMERSW
GET TXSTART FROM ROM
PUT INTO TXSTART RAM
PUT START OF TRANSMIT BLOCK INTO TRANSMIT COUNTER (TXC)
GET DATARATE FROM ROM
PUT INTO TCR TO DETERMINE TRANSMIT SPEED
CLEAR PORT C
LOOP
 PUT BIT COUNTER TO 8 BITS
 GET TXWORD USING TXC AS POINTER

```

PUT INTO TXWORD
LOOP
  LOOP UNTIL TIMER READY
  ENDLOOP
  RESET TIMER BIT
  PUT TXWORD INTO PORT C
  CLEAR STROBE (BIT 1) IN PORT C
  OUTPUT ON BIT 0 AND BIT 1
  LOOP UNTIL TIMER READY
  ENDLOOP
  RESET TIMER BIT
  SET BIT 1 IN PORT C (STROBE)
  OUTPUT ON BIT 0 AND BIT 1
  SHIFT TXWORD ARITHMETICALLY RIGHT ONCE
  DECREMENT BIT COUNTER
  ENDLOOP UNTIL ALL BITS TRANSMITTED (BIT COUNTER=0)
  DECREMENT TRANSMIT COUNTER (TXC)
  ENDLOOP UNTIL ALL WORDS TRANSMITTED (TXC=OF)
  CLEAR STATUS
  GET TCR INIT FROM ROM
  PUT INTO TCR
  RESET STACK POINTER
  START MAIN LOOP

```

 TRANSFER RX ROUTINE

```

SET TRANSMIT COUNTER TO START OF MEMORY MOVE (6E)
GET TXSTART FROM ROM
PUT INTO TXWORD
PUT BITCOUNTER TO 8 BITS
SET PORT C BITS AS OUTPUTS
LOOP
  LOOP
    LOOP UNTIL STROBE RECEIVED
    ENDLOOP
    GET GLITCH TIME FILTER VALUE FROM ROM
    LOOP UNTIL GLITCH FILTER READY
    ENDLOOP
  ENDLOOP IF STROBE NOT PRESENT (VALID STROBE)
  GET INPUT DATA FROM PORT C
  COMPARE DATA TO TXSTART USING EXCLUSIVE OR
  ROTATE ACCUMULATOR INTO CARRY BIT
  IF DATA IS NOT AS PREDICTED THEN
    BREAK CALL ERROR RECOVERY ROUTINE
  ENDIF
  ROTATE TXSTART ONCE TO THE RIGHT
  LOOP
  ENDLOOP AS LONG AS STROBE IS PRESENT
  DECREMENT BIT COUNTER (BITC)
  ENDLOOP UNTIL ALL BITS RECEIVED
  LOOP
  LOOP
    PUT BIT COUNTER TO 8 BITS
    LOOP
      LOOP UNTIL STROBE RECEIVED
      ENDLOOP
      GET GLITCH TIME FILTER VALUE FROM ROM
      LOOP UNTIL GLITCH FILTER READY
      ENDLOOP
    
```

```

ENDLOOP IF STROBE NOT PRESENT (VALID STROBE)
GET INPUT DATA FROM PORT C
ROTATE ACCUMULATOR INTO CARRY BIT
ROTATE CARRY BIT INTO TXWORD
LOOP
ENDLOOP AS LONG AS STROBE IS PRESENT
DECREMENT BIT COUNTER (BITC)
ENDLOOP UNTIL ALL 8 BITS RECEIVED
GET TXWORD
PUT TXWORD INTO RAM AT LOCATION IN TXC
DECREMENT TRANSMIT COUNTER (TXC)
ENDLOOP UNTIL TRANSMIT COUNTER IS AT $OF
CALL CONFIGURE
RESETSTATUS
RESET STACK POINTER
START MAIN LOOP

-----
ERROR RECOVERY ROUTINE
-----
PUT TIMEOUT VALUE INTO TIMESW
RESET STACK POINTER
CALL TIMERSW
START TRANSFER RX ROUTINE

-----
LIGHT INPUT ROUTINE
-----
GET KEYDATA
PUT INTO INDEX
IF LCRX IS NOT ALREADY LIT THEN
    PUT INDEX INTO LCR POINTER
    SET LATCH DRIVER
    CALL LATCH MODIFY ROUTINE
    RESET LATCH DRIVER
    CALL WRITE LATCH ROUTINE
    CLEAR ACCUMULATOR
    SET CARRY
    GET ROW FROM RAM
    LOOP
        ROTATE ROW LEFT
        CLEAR CARRY
        DECREMENT INDEX
    ENDLOOP WHILE SHIFTS DO NOT EQUAL ROWS
    AND MASK WITH CONFIGURATION FLAGS
    IF FLAGS SAY USE LOWER TIMING THEN
        GET BURNTIME 1
    ELSEIF FLAGS SAY USE UPPER TIMING THEN
        GET BURNTIME 0
    ENDIF
    GET LCR COUNTER INTO INDEX
    PUT BURNTIME (λ) INTO LCR USING LCRC AS POINTER
    CLEAR LIGHT INPUT FLAG (LIF)
ENDIF
RETURN

-----
TRANSFER REQUEST ROUTINE
-----
START TRANSFER TX ROUTINE

```

 BURNTIME INPUT ROUTINE

```

IF SET BUTTON HAS BEEN PUSHED THEN
  IF NO TIME HAS BEEN RECEIVED FROM UPPER LEVEL THEN
    IF NO TIME HAS BEEN RECEIVED FROM LOWER LEVEL THEN
      CLEAR ALL LIGHTS EXCEPT THE SET LIGHT
      CALL WRITE LATCH
      START TRANSFER RX ROUTINE
    ELSE
      RETURN
    ENDIF
  ELSEIF TIME HAS BEEN RECEIVED FROM LOWER LEVEL
    IF TIME HAS BEEN RECEIVED FROM UPPER LEVEL
      LOOP
        LOAD INDEX WITH # OF REGISTERS TO CLEAR
        CLEAR LATCH REGISTERS USING INDEX
        DECREMENT INDEX
      ENDLOOP UNTIL ALL REGISTERS CLEARED
    ENDIF
  ENDIF
  INCREMENT UPPER BURNTIME
  INCREMENT LOWER BURNTIME
  CALL WRITE LATCH
  CLEAR STATUS FLAGS
  RETURN
ELSEIF THE STAND IS SPLIT
  IF UPPER LARGE INPUT BUTTON PUSHED THEN
    GET LARGE INCREMENT FROM ROM
    ADD WITH BURNTIME
    PUT INTO BURNTIME
    SET UPPER INPUT FLAG
    GET INPUT COUNTER LG 0
    PUT INTO KEYDATA
    INCREMENT COUNTER
    IF COUNTER IS LESS THAN MAX ALLOWED THEN
      CALL LIGHT INPUT ROUTINE
    ENDIF
  ELSEIF UPPER SMALL INPUT BUTTON PUSHED THEN
    GET LARGE INCREMENT
    ADD WITH BURNTIME
    PUT INTO BURNTIME
    SET UPPER INPUT FLAG
    GET INPUT COUNTER SM 0
    PUT INTO KEYDATA
    INCREMENT COUNTER
    IF COUNTER IS LESS THAN MAX ALLOWED THEN
      CALL LIGHT INPUT ROUTINE
    ENDIF
  ENDIF
ENDIF
IF LOWER LARGE INPUT BUTTON PUSHED THEN
  GET LARGE INCREMENT FROM ROM
  ADD WITH BURNTIME
  PUT INTO BURNTIME
  SET LOWER INPUT FLAG
  GET INPUT COUNTER LG 1
  PUT INTO KEYDATA
  INCREMENT COUNTER

```

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4 675 578

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```

IF COUNTER IS LESS THAN MAX ALLOWED THEN
  CALL LIGHT INPUT ROUTINE
ENDIF
ELSEIF LOWER SMALL INPUT BUTTON PUSHED THEN
  GET LARGE INCREMENT
  ADD WITH BURNTIME
  PUT INTO BURNTIME
  SET LOWER INPUT FLAG
  GET INPUT COUNTER SM 1
  PUT INTO KEYDATA
  INCREMENT COUNTER
  IF COUNTER IS LESS THAN MAX ALLOWED THEN
    CALL LIGHT INPUT ROUTINE
  ENDIF
ENDIF
-----
INPUT DECODE
-----
CALCULATE KEYDATA USING ROW AND COLUMN
PUT IN KEYDATA REGISTER
IF HELDKEY IS NOT SET THEN
  SWITCH SYSTEM FLAGS (STATUS)
    CASE BURNTIME INPUT FLAG
      CALL BURNTIME INPUT ROUTINE
    ENDCASE
    CASE TRANSFER REQUEST FLAG
      START TRANSFER TX ROUTINE
    ENDCASE
    CASE LIGHT INPUT FLAG
      CALL LIGHT INPUT ROUTINE
    ENDCASE
  ENDSWITCH
ENDIF
SET HELDKEY
RETURN
-----
MAIN LOOP
-----
LOOP WITH NO EXIT
  PUT MAXIMUM COL# INTO TEMP
  GET MASK
  PUT MASK INTO STROBE/BIT MASK
  PUT MASK ON ROW OUTPUTS
  PUT ROW TO ZERO
  LOOP
    PUT COL TO ZERO
    SET PORT C FOR OFFERING INPUT (BIT 2)
    LOOP UNTIL TIMER SET
      IF OFFERING SET THEN
        SET LIGHT INPUT FLAG (LIF)
      ELSEIF INTERRUPT LINE LOW THEN
        SET TRANSFER REQUEST FLAG
      ENDIF
    ENDLOOP
    RESET TIMER
    SET PORT C OUTPUTS AND INPUTS
    IF TRANSFER REQUEST FLAG SET THEN
      CALL INPUT DECODE
    
```

```

ENDIF
SWITCH PORT C DATA
  CASE COL0|COL1|COL2|COL3|COL4|COL5|
    COL6|COL7|COL8|COL9|
    BREAK CALL INPUT DECODE
  ENDCASE
  CASE DEFAULT
    DO NOTHING
  ENDCASE
ENDSWITCH
SET NEXT ROW HIGHER
GET NEW MASK
PUT NEW MASK TO ROW OUTPUTS
ENDLOOP UNTIL ROW IS AT ROWMAX
RESET HELDKEY
CALL WRITE LATCH
DECREMENT UPDATE
IF UPDATE IS ZERO THEN
  BREAK CALL UPDATE
ENDIF
ENDLOOP
-----
UPDATE
-----
SWITCH UPDATE SELECT FLAG
  CASE FLAG SET
    GET UPDATE1 FROM ROM
    PUT INTO UPDATE
    GET TIME INC1
    PUT INTO TIME INC
  ENDCASE
  CASE FLAG RESET
    GET UPDATE0 FROM ROM
    PUT INTO UPDATE
    GET TIME INC0
    PUT INTO TIME INC
  ENDCASE
ENDSWITCH
SET TOP OF LCR
LOOP
  IF LCR CONTENT IS NOT ZERO THEN
  ELSEIF LCR CONTENT IS NOT ONE THEN
    DECREMENT CONTENT OF LCR
  ELSE
    CALL LATCH MODIFY
    CALL WRITE LATCH
  ENDIF
  DECREMENT POINTER TO SELECT NEW LCR
ENDLOOP UNTIL OUT OF LCR S
RETURN
-----
LATCH MODIFY
-----
GET LCR POINTER FROM RAM
CALCULATE LATCH NUMBER USING OCTAL ROUTINE
CALCULATE BIT NUMBER USING OCTAL ROUTINE
PUT LATCH NUMBER INTO LATCH POINTER
PUT BIT NUMBER INTO LBIT
PUT LATCH INTO TEMPORARY REGISTER

```

PUT FIRST MASK INTO STROBE/BIT MASK
 LOOP UNTIL BIT IS SELECTED
 ROTATE MASK TO SELECT NEW BIT
 DECREMENT BIT COUNTER
 ENDLOOP
 LOAD BIT MASK CHOSEN
 SWITCH LATCH DRIVER FLAG
 CASE FLAG OFF
 COMPLEMENT MASK
 RESET BIT IN LATCHX USING AND FUNTION
 PUT BACK INTO LATCHX
 ENDCASE
 CASE FLAG ON
 SET BIT IN LATCHX USING OR FUNCTION
 PUT BACK INTO LATCHX
 ENDCASE
 ENDSWITCH
 GET INDEX REGISTER FROM TEMPORARY REGISTER
 RETURN

 WRITE LATCH

PUT STROBE DATA INTO STROBE MASK
 SET ALL OF PORT B TO OUTPUTS
 SET LATCH POINTER TO FIRST LATCH
 LOOP
 GET LATCH DATA
 PUT ON DATA BUS (PORT B)
 GET STROBE DATA
 PUT ON STROBE OUTPUTS (PORT A)
 CLEAR STROBE OUTPUTS
 CLEAR DATA OUTPUTS
 INCREMENT TO NEXT LATCH
 ROTATE MASK FOR NEXT LATCH
 ENDLOOP WHILE LATCHES ARE LEFT
 RETURN

 INITIALIZATION

CLEAR MEMORY (RAM)
 SET BURNTIME INPUT FLAG
 PUT INITIAL DATA CONTROL REGISTER DATA INTO DDR'S
 (A 3F B FF C FF)
 SET LATCH0 TO LATCH7 TO ALL ON
 CALL WRITE LATCH
 CALL TIMER USING 5 SECONDS
 CALL CONFIGURE
 CALL UPDATE
 GET BURNTIME INPUT LATCH PATTERN FROM ROM
 PUT INTO LATCH VARIABLES
 IF CONFIGURATION NOT SPLIT THEN
 CLEAR LATCH 0
 ENDIF
 CALL WRITE LATCH
 GET TIME INPUT INDICATOR LOCATIONS FROM ROM
 PUT INTO INDICATOR COUNTERS IN RAM
 RETURN

```
-----  
TIMERSW  
-----  
LOOP  
    LOOP UNTIL TIMER SET  
    ENDLOOP  
    RESET TIMER  
ENDLOOP UNTIL TIMERSW ZERO  
RETURN
```

PSEUDO CODE STANDARDS

This section describes the conventions for the design and writing of programs in PDL (PROGRAM DESIGN LANGUAGE OR PSEUDO-CODE)

The following VERBS are used in PDL

ATTACH

DETACH

GET FROM USING

PUT ON

OPEN AS

CLOSE

EXIT WITH STATUS

CALCULATE USING

SORT BY

SEARCH FOR

SEND TO

START

STOP

ABORT

WAIT FOR

ENCODE IN

DECODE FROM

CALL

SET

RESET

ENABLE
 DISABLE
 CLEAR
 DECREMENT
 INCREMENT

The following DATA STRUCTURE names are used in PDL

ARRAY
 QUEUE
 STACK
 RECORD
 SEQUENTIAL FILE
 RANDOM FILE

Also these primitive names are used

CHARACTER
 STRING
 INTEGER
 REAL
 COMPLEX

The specification of a data structure should contain both the structure type and the data type, for example

xyz ARRAY OF INTEGER
 ABC QUEUE OF STRING

The following CONTROL STRUCTURES are used in PDL

ISR	Interrupt Service Routine
ENDISR	End Routine
TSR	Trap Service Routine
ENDTSR	End Routine

LOOP	Repetitive constructs
ENDLOOP	End of repetitive construct
LOOP WHILE	Test at start of loop
ENDLOOP	
LOOP	Test at end of loop
ENDLOOP WHILE	
LOOP FOR TO BY	Use index variable
ENDLOOP	
IF THEN	Do if true
ELSEIF THEN	Or do if this is true
ELSE	If above not true do this
ENDIF	End of decision construct
RETURN	End of subroutine
SWITCH	What you will be looking at
CASE	The case you are looking for
ENDCASE	End of this particular case
ENDSWITCH	End of the entire investigation

We claim

1. An electric votive light controller system having a plurality of lamps each lamp having an individual lamp address and a switching matrix having a plurality of switches, each switch associated with only one lamp comprising

control means coupled to each of the lamps for actuating the lamps in response to a closing of the switch associated with each respective lamp and the control means including timing means for turning off each lamp a programmable predetermined period of time after its actuation.

2. The system of claim 1 in which the timing means includes angular timing means for determining the duration of the predetermined period of time independently for each lamp

3. The system of claim 1 in which the switching ma

trix comprises a switching array having rows and columns and the control means includes means for polling the rows and columns to determine the lamp address associated with an actuated switch

4. The system of claim 3 in which there is further provided a latch matrix including a plurality of latches each latch associated with one switch and coupled to one lamp in which a latch activates a lamp in accordance with the determined lamp address.

5. The system of claim 1 including transmission means coupled to the control means for transferring status information from the controller to a remote system

6. The system of claim 1 in which the controller means includes split mode means for permitting the system to operate as two independent systems.

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(43) Application published 8 Jul 1987

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(33) DE

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(51) INT CL

A47G 33/02

(52) Domestic classification (Edition I)

A4X U29

(56) Documents cited

None

(58) Field of search

A4X A4L

Selected US specification from IPC subclass A47G

(54) Offertory candle table

(57) The table comprises a frame (2) which has at least one support (4) on which is provided a plurality of holders (5) for the offertory candles (1). Each candle (1) comprises an electric lamp (13) and a contact base (20-34) which can be fitted into any one of the holders (5) which are provided with electrical contact surfaces (32-25-26-40).

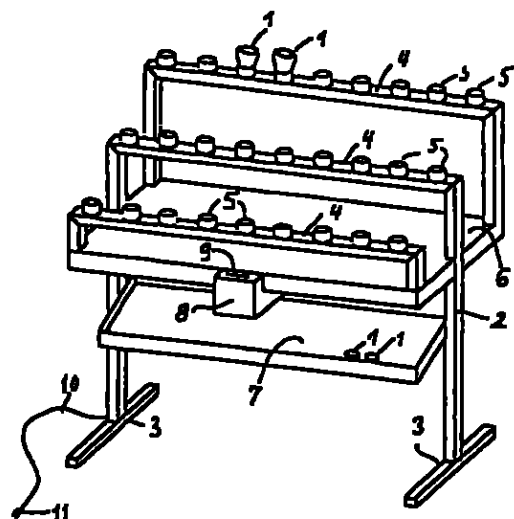


Fig 1

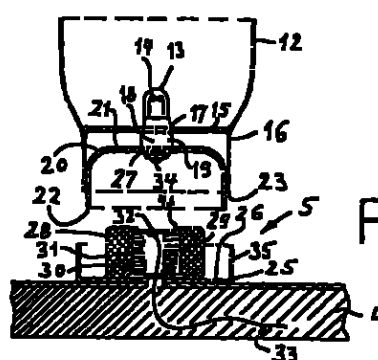


Fig 3

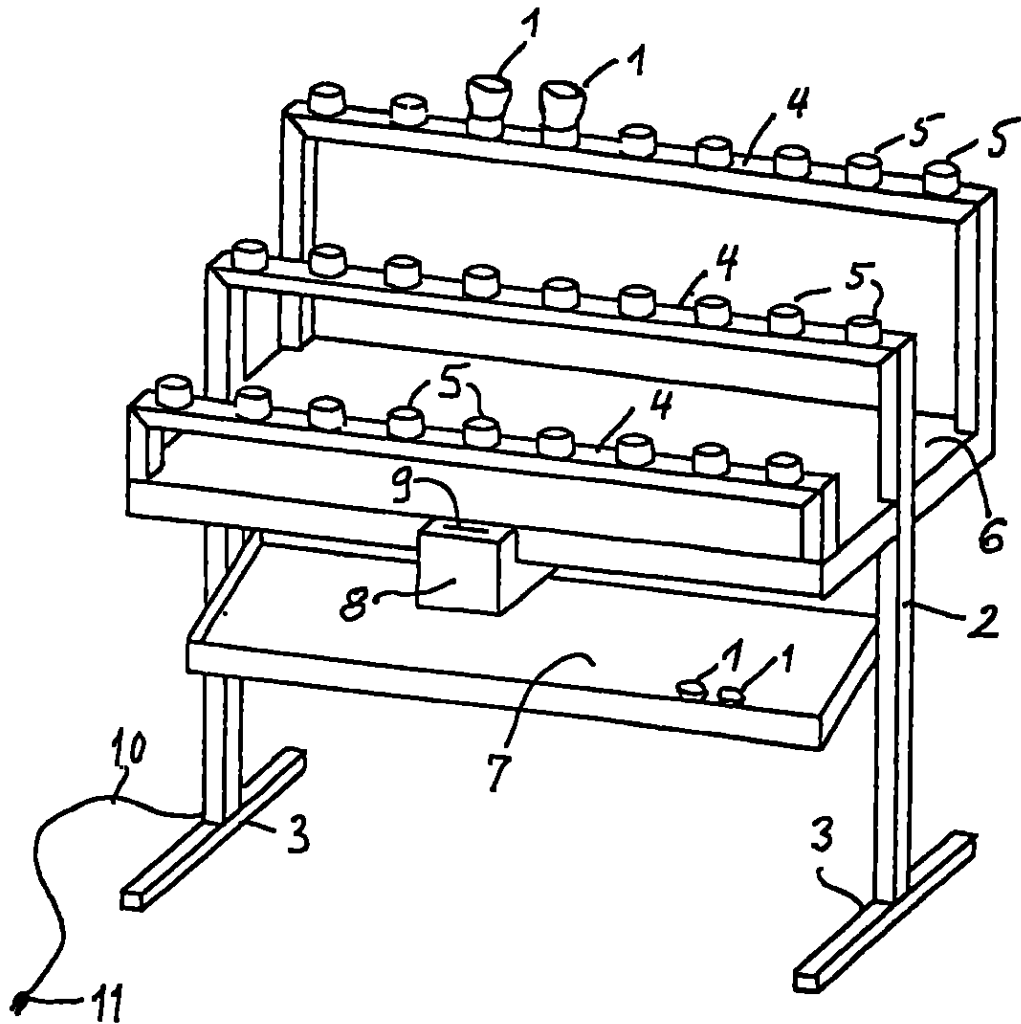


Fig 1

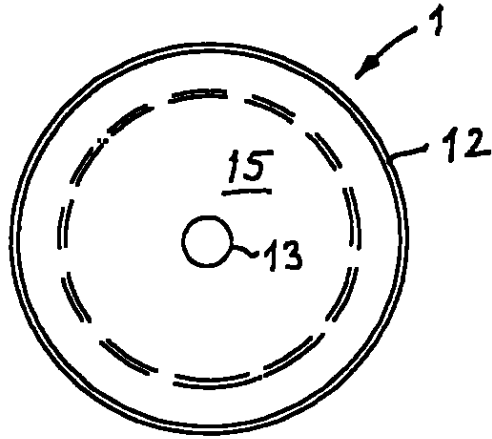


Fig 2

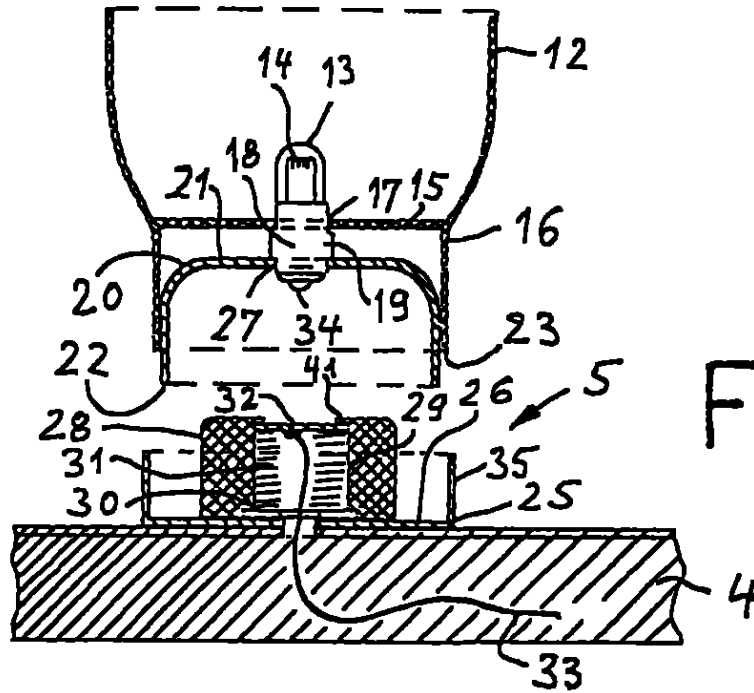


Fig 3

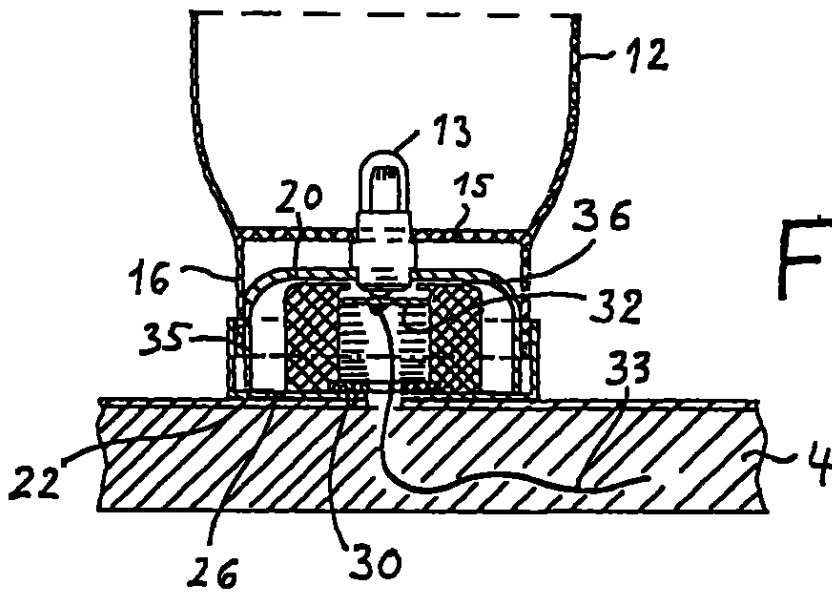


Fig. 4

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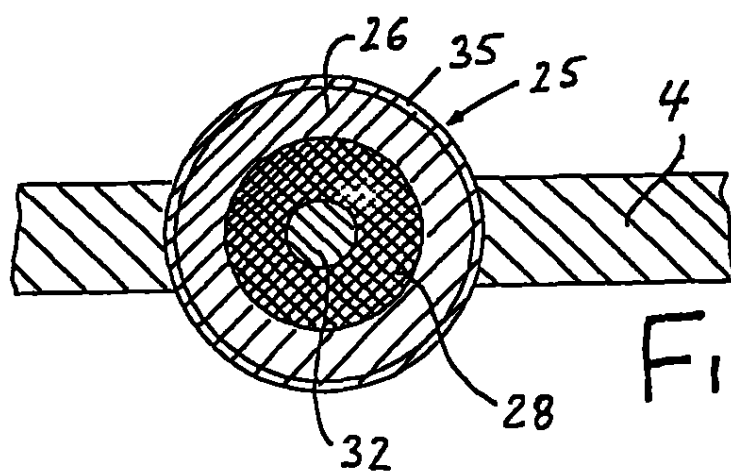


Fig 5

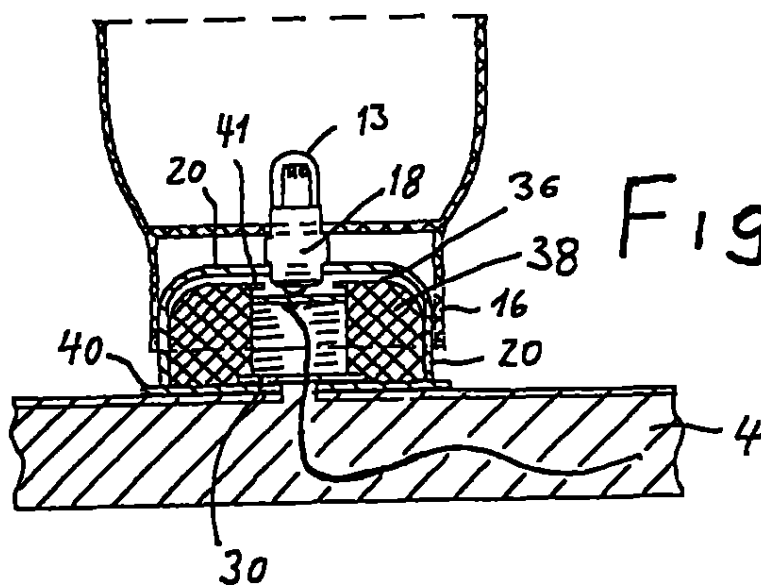


Fig 6

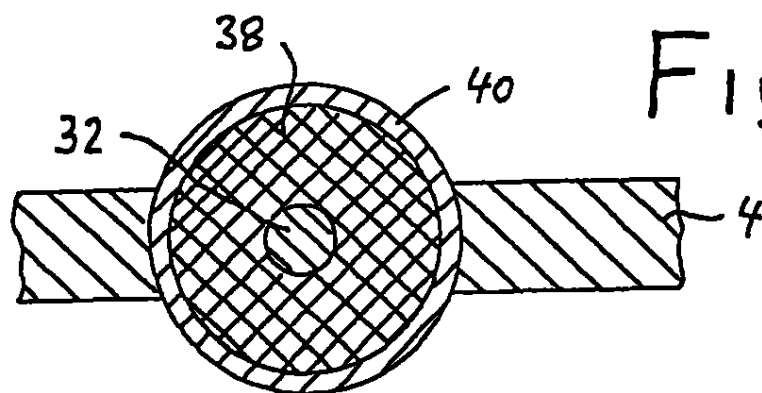


Fig. 7

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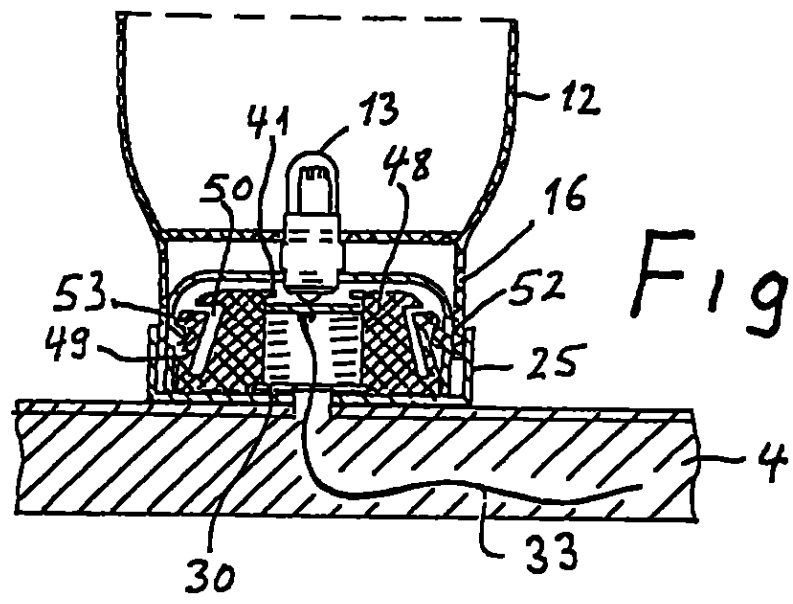


Fig 8

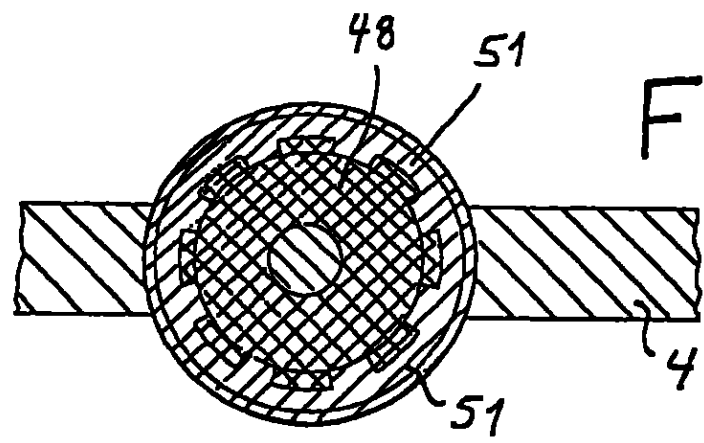


Fig 9

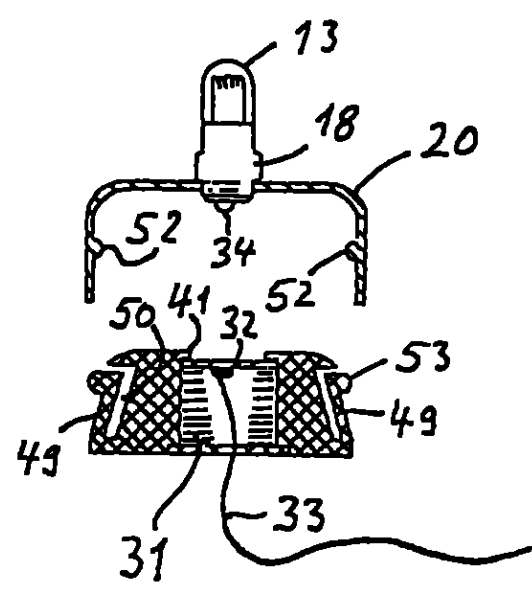


Fig. 10

7.2

SPECIFICATION

Offertory candle table

5 The invention relates to an offertory or sacrificial candle table comprising a frame which has at least one support for offertory candles and on which are provided a plurality of holders for the offertory candles.

10 Offertory candle tables of that kind are frequently set up in places of worship, memorial places, churches or other religious premises and permit individuals to light an offertory light upon making a contribution. Known offertory candle tables comprise a plurality of carriers which are arranged in rearwardly displaced and superposed relationship, with candle holders for inserting wax candles or fitting wax candles thereonto. The large number of wax candles which frequently burn at the same time causes the wall and ceiling surfaces to become sooted up and therefore and in particular in churches causes damage to works of art, mural paintings and frescoes displayed therein. Substantial cost is often involved in removing wax which runs off the candles from floors, carpets and rows of seats. Another problem is that offertory candle tables of a light structure can easily be tipped over by someone knocking against them and the hot wax which then drips off and the burning wick represent a not inconsiderable fire risk. Finally, the open flames, particularly when there is a dense array of candles, involves a danger of burn injury if people who are manually less dextrous, in particular children and older people, wish to light an offertory candle.

20 Taking that art as its basic starting point, the present invention is based on the problem of providing an offertory candle table which, while retaining the present ritual, permits offertory lights to be donated without risk and without pollution of the environment.

In accordance with the invention, in an offertory candle table of the kind set forth in the opening part of this specification, that problem is solved in that the offertory candles have an electric lamp and a contact base which can be fitted into the holders which are provided with electrical contact surfaces. In an advantageous embodiment of the invention, the offertory candles are in the configuration of a coloured transparent bowl, in the bottom of which is fixed an incandescent lamp. Preferably, formed on the bottom of the bowl is a cylindrical socket into which is fitted a contact cap whose opening faces away from the bottom and which projects with its edge beyond the edge of the socket and by means of which the socket of the incandescent lamp is clamped between the bottom of the bowl and the top side of the contact cap, wherein the central contact extends through an opening into the interior of the contact cap.

50 The holders on the carriers each have a disc-like contact bottom and a spring contact which is arranged concentrically with respect thereto. The spring contact is preferably provided in the vicinity of the top of a cylindrical plastics housing which is fixed concentrically on the contact bottom. The insulating housing has a cylindrical bore in which there is disposed a coil spring which presses a contact disc displaceable in the bore against an abutment ring at the top of the

Insulating housing.

Further advantageous features and embodiments are the subject matter of subsidiary claims.

Embodiments of the invention are described, by way of example, in greater detail hereinafter with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a perspective view of an offertory candle table according to the invention.

Figure 2 is a plan view of an offertory candle for the offertory candle table shown in Figure 1;

Figure 3 is a view in section through an offertory candle with an associated holder on the carrier of the offertory candle table;

Figure 4 is a view in section through the holder and the offertory candle in the inserted condition;

Figure 5 is a plan view of the holder;

Figure 6 is a view in cross-section of a further embodiment of a holder with offertory candle fitted thereon;

Figure 7 is a plan view of the holder shown in Figure 6;

Figure 8 is a view in section of a third embodiment for a holder with an offertory candle;

Figure 9 is a plan view of the holder shown in Figure 8; and

Figure 10 is a view in section of the contact cap and the insulating housing of the arrangement shown in Figure 8, in the disassembled condition.

The offertory candle table shown in Figure 1 substantially corresponds in terms of its external appearance to a conventional offertory candle table for wax candles although the offertory candle table shown in Figure 1 is intended for electrical offertory candles 1 of a specific configuration.

The offertory candle table comprises a frame 2 having legs 3 and a plurality of carriers 4 which are arranged in superposed and rearwardly displaced relationship and on which are fixed holders 5 which are of a specific configuration for the electrical offertory candles 1. The carriers 4 comprise for example shaped members of a L-configuration or a U-configuration, of wrought iron. On the side which faces rearwardly in Figure 1 are electric lines (not visible) in cable ducts which connect the holders 5 to an electrical control circuit which is disposed in a housing 8 which can be in the form of a table panel. The electrical control circuit provides that, after an electrical offertory candle 1 has been fitted on to one of the holders 5, the electrical offertory candle 1 remains switched on for a predetermined period of time and is thereafter extinguished. If the electrical offertory candle 1 remains outside the holder 5 for a period of time which exceeds a given minimum period, then when the offertory candle is electrically connected again to the holder 5, current is again supplied for a predetermined period of time. In that way it is possible to keep electrical offertory candles 1 ready on a storage table 7, in a manner corresponding to the wax candles used in the past, so that, in accordance with the previously known ritual, electrical offertory candles 1 are taken from the storage table 7 and fitted to one of the holders 5 whereupon the electrical offertory candle provides an offertory light for a predetermined period of time.

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Associated with the housing 8 is a further sub-housing 8 which contains for example the transformer for the electrical control circuit and the box for the contribution which is to be inserted through a slot 9.

5 The transformer disposed in the sub-housing 8 can be connected to the electrical power mains by way of an electrical connecting cable 10 and a mains plug 11.

The structure of the electrical offertory candles 1 and the holders 5 are described in greater detail hereinafter.

Figure 2 shows an electrical offertory candle 1 from above while Figure 3 shows the electrical offertory candle 1 shortly before it is fitted into a holder 5 and Figure 4 shows the arrangement when the offertory light is switched on.

As will be seen from the drawings, the electrical offertory candle 1 comprises a bowl 12 which preferably consists of a red transparent plastics material and which allows the light of an incandescent lamp 13 to appear at a small distance, like the light of an offertory candle consisting of wax, which is very frequently disposed in a red plastics bowl. The incandescent filament 14 of the lamp 13 preferably extends in an inverted V-shaped configuration, unlike the diagrammatic view in the drawings, thus substantially imitating the shape of a candle flame.

Like the bowls used for wax candles, the bowl 12 has a bottom 15 and a socket or holder 16 which is formed or moulded thereon. For the purposes of fixing the incandescent lamp 13 which is of a size for example for a voltage of 12 V and 1.2 W and which is preferably powered by a d.c. operating voltage of 10.5 V, provided in the bottom 15 of the bowl 12 is an opening 17 which permits the incandescent lamp 13 to be inserted from the side of the socket 16 into the opening 17 to such an extent that the incandescent lamp base 18 which possibly has raised portions 19 is locked in the direction of insertion.

As can also be seen in particular from Figure 3, a contact cap 20 which is preferably of brass, is fitted into the socket 16 from below to such an extent, and is connected to the inside of the socket 16 for example by adhesive, that the incandescent lamp base 18 is fixedly clamped between the top side 21 of the contact cap 20 and the bottom 15 of the bowl 12. In that position the lower edge 22 of the substantially cup-shaped contact cap 20 projects beyond the lower edge portion 23 of the socket 16 so that, when the bowl 12 is fitted on to a support, the lower edge 22 of the contact cap bears against the support.

Figure 3 also shows a portion of one of the carriers 4 with a holder 5. In the construction shown in Figure 3, the holder 5 comprises a contact shell 25 having a contact bottom 26 which is fixedly connected, for example by soldering, to the carrier 4 which is provided as the earth line, on the frame 2. The contact shell 25 with the contact bottom 26 are preferably of brass so that, after the lower edge 22 of the contact cap 20 has been fitted on, there is a good electrical contact with the incandescent lamp 13 which is fitted into an opening 27 in the contact cap 20 with its base 18, and thus electrically connected.

Disposed concentrically with respect to the contact shell 25 is a cylindrical housing 28 of insulating material, which is connected to the top side of the

contact bottom 26, for example by using adhesive on its underside. The insulating housing 28 is for example of PVC and projects beyond the contact bottom 26 approximately by the depth of the contact cap 20, as can be best seen from Figure 4 which shows the way in which the contact cap 20 is supported with its lower edge 22 on the contact bottom 26. Disposed in the interior of the insulating housing 28 is a cylindrical bore 29 in which there is a coil spring 31 whose lower end is supported against a plastics disc 30. Provided at the opposite end of the coil spring 31 is a contact disc 32 which is preferably of brass and which is connected to the electrical power supply arrangement by way of a soldered wire 33. Apertures are provided both in the carrier 4 and in the contact bottom 26 and the plastics disc 30, for the wire 33.

Comparison between Figures 3 and 4 will show that, after the electrical offertory candle 1 has been fitted into place, the central contact 34 of the incandescent lamp 13 displaces the contact disc 32 downwardly in the cylindrical bore 29 as a result of the inherent weight, against the force of the coil spring 31. The contact pressure which is thus produced between the contact disc 32 and the central contact 34 of the incandescent lamp 13 is sufficient, like the contact pressure at the lower edge 22 of the contact cap 20 as a result of the inherent weight of the electrical offertory candle 1 which in particular is increased by the metal nature of the contact cap 20. Therefore the electrical current which is introduced by way of the wire 33 passes by way of the contact disc 32, the central contact 34, the incandescent filament 14, the incandescent lamp base 18, the contact cap 20, the contact bottom 26 and the carrier 4 to the mains arrangement in the housing 8. The presence or absence of the electrical offertory candles 1 can be easily ascertained by the electronic control circuit provided in the housing 6, by virtue of the fact that the resistance of the holder 5 falls abruptly after the electrical offertory candle 1 has been fitted into position.

While in the embodiment of the holder 5 shown in Figures 3 and 4, a circumferential lateral guide wall 35 of the contact shell 25 provides a radial guiding action, that is effected by means of insulating housings of a specific configuration, in the case of the embodiments described hereinafter.

It will be seen not just from Figures 3 and 4 but also from Figure 5 that, in the embodiment first described above, in respect of the holder 5, the diameter of the insulating housing 28 is substantially smaller than that of the contact shell or dish 25 and the contact cap 20. Figure 4 shows that the outside of the socket 16 can come to bear against the inside of the guide wall 25, and is guided thereby. In practice there is a slight gap which is not perceptible in the drawings. It will be appreciated that a gap 36 is provided between the top side of the insulating housing 28 and the inward side, which faces theretowards, of the contact cap 20, thereby ensuring that when the electrical offertory candle is fitted into place, contact occurs only at the central contact 34 and the lower edge 22, without the insulating housing 28 coming into contact with the contact cap 20, which is provided in respect of the side walls of the insulating housings described hereinafter,

In order to guide the contact cap 20.

The electrical offertory candle 1 shown in Figure 6 corresponds to the offertory candle 1 shown in the preceding Figures of drawings. However, provided on the carrier 4, instead of a contact shell 25, is a contact disc 40 which is electrically conductively connected to the carrier 4. Fixed on the contact disc 40 is an insulating housing 38, the construction of which substantially corresponds to the insulating housing 28. In particular, a cylindrical bore 29 is also provided in the insulating housing 38 for accommodating a coil spring 31 and a contact disc 32 which, when the electrical offertory candle 1 is not fitted into position, bears against an abutment ring 41 at the top of the insulating housing 38.

The diameter of the insulating housing 38 is equal to or slightly smaller than the inside diameter of the contact cap 20 so that the insulating housing 38 provides a guide action without impeding the downward sliding movement of the contact cap 20 on to the top of the contact disc 40.

Figure 7 shows a plan view of the holder 5 provided with the insulating housing 38 of larger diameter. It will be seen that the contact disc 40 projects only with an outer edge portion beyond the periphery of the insulating housing 38. Figure 7 also shows the contact disc 32 which is guided in the cylindrical bore 29.

While in the above-described embodiments it is only the force of gravity that maintains the electrical contact, which can result in short interruptions in the supply of current for example if the offertory candle table is subjected to shaking or rattling movements, in the embodiment illustrated in Figures 8 to 10 the construction additionally provides a mechanical locking action.

Corresponding to the above-described embodiments, provided on the carrier 4 is a contact shell or cup 25 or also a contact disc 40 without a guide wall portion. An insulating housing 48 is provided concentrically with respect to the contact shell 25 or the contact disc 40 which may alternatively be used. In contrast to the insulating housing 28 and 38, the peripheral surface of the insulating housing 48 is not of a uniformly cylindrical configuration, but has a plurality of projecting claws 49. The claws 49 which are shown in section in Figures 8 and 10 and in plan in Figure 9 are resiliently connected to the insulating housing 48 in the vicinity of the bottom thereof. For that reason, the claws 49 can be resiliently pressed into intermediate spaces 50 in order to yield upon insertion of the contact cap 20 into the annular gap 51 between the insulating housing 48 and the guide wall portion 35 of the contact shell 25, when a bead 52 provided on the inside of the contact cap 20 comes into contact with the head portions 53 of the claws 49. When the bead 52 has passed the head portions 53 as it moves downwardly, the head portions 53 spring radially outwardly again and take up the position shown in Figure 8 in which the head portions 53 of the claws 49 lock the electrical offertory candle 1 in position. The shape of the bead 52 and the head portions 53 provides that an additional pressing force acting towards the carrier 4 is produced. When the offertory candle 1 is removed, the rounded head portions 53 are deflected back into the intermediate

spaces, as a result of the force applied thereto by the bead 52, and, after a predeterminable resistance is overcome, open the way for removal of the offertory candle 1.

In order clearly to show the form of the bead 52 and the claws 49 which are provided with the head portions 53, Figure 10 shows the insulating housing 48 with the contact cap 20 removed.

CLAIMS

1. An offertory candle table comprising a frame which has at least one support for offertory candles and on which are provided a plurality of holders for the offertory candles wherein each offertory candle has an electric lamp and a contact base which can be fitted into the holders which are provided with electrical contact surfaces.

2. A table according to Claim 1 wherein the offertory candles are in the configuration of a coloured transparent bowl, in the bottom of which is fixed an incandescent lamp.

3. A table according to Claim 2 wherein formed on the bottom of the bowl is a cylindrical socket into which is fitted a contact cap whose opening faces away from the bottom and which projects with its edge beyond the edge of the socket and by means of which the socket of the incandescent lamp is clamped between the bottom of the bowl and the top side of the contact cap, wherein the central contact extends through an opening into the interior of the contact cap.

4. A table according to one of Claims 1 to 3 wherein the holders on the carriers each have a disc-shaped contact bottom and a spring contact arranged concentrically with respect thereto.

5. A table according to Claim 4 wherein the spring contact is formed in the vicinity of the top side of a cylindrical housing of insulating material, which is fixed concentrically on the contact bottom.

6. A table according to Claim 5 wherein the insulating housing has a cylindrical bore in which there is disposed a coil spring which presses a contact disc displaceable in the bore against an abutment ring at the top of the insulating housing.

7. A table according to Claim 6 wherein the coil spring is supported against a plastics disc which is provided at the underside of the insulating housing.

8. A table according to one of Claims 4 to 7 wherein at the outer edge the contact bottom has a circumferentially extending guide wall.

9. A table according to one of Claims 4 to 7 wherein at the outside diameter of the insulating housing approximately corresponds to the inside diameter of the cup-shaped contact cap.

10. A table according to Claim 8 wherein provided along the periphery of the insulating housing are a plurality of elastic claws which are formed on the insulating housing in the vicinity of the underside thereof and which can be brought into latching engagement with a radially inwardly projecting bead which is provided on the inside of the contact cap and extends circumferentially thereof.

11. A table according to Claim 1 constructed, arranged and adapted to operate substantially as herein described with reference to, and as shown in, the accompanying drawings.

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[54] ELECTRONIC CANDLE SYSTEM

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315/317; 362/810

[58] Field of Search 315/151, 153, 184, 195,
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[56] References Cited

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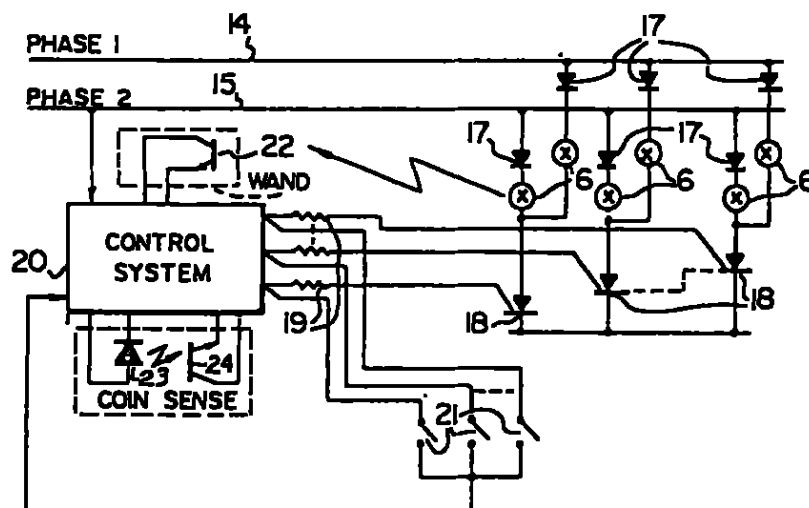
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Primary Examiner—Harold Dixon
Attorney, Agent, or Firm—Leonard Bloom

[57] ABSTRACT

The present invention relates to an array of simulated candles, utilizing light bulbs, which allows the user to turn on any selected light bulb merely by pointing a wand close to the light bulb to be turned on. Once turned on the light bulbs are caused to flicker in a manner which simulates very realistically the flickering of candle flames, including the increase and decrease of the illumination of all of the light bulbs (or selected groups of light bulbs if desired) which are observable in an array of candles during random breezes encountered by the candles in a room.

20 Claims, 11 Drawing Figures



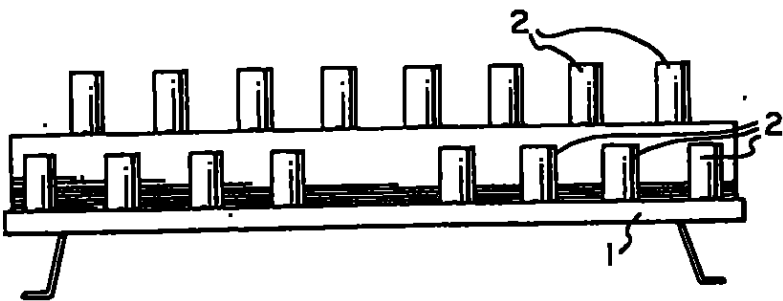


FIG. 1

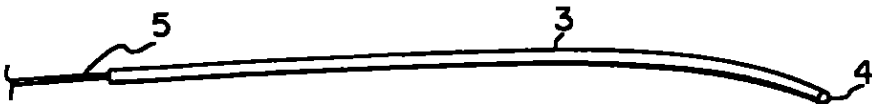
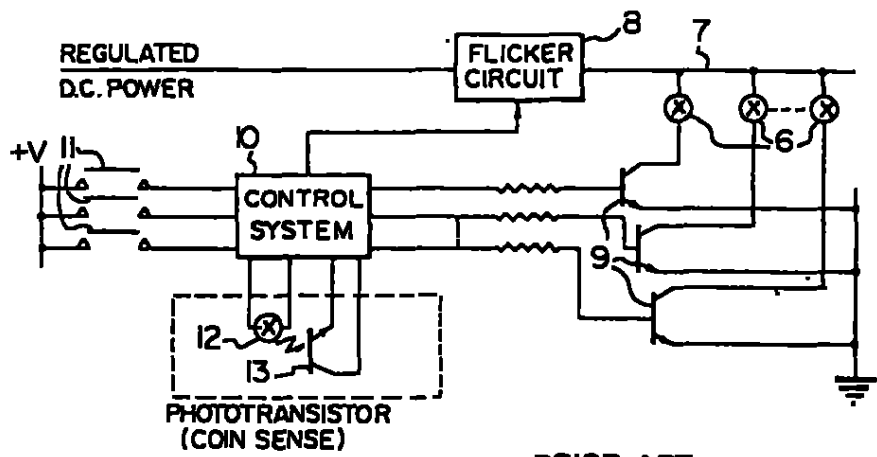


FIG. 2

16 BYTES	
CANDLE (BULB) TIMERS (1 BYTE/TIMER)	
SCR PATTERN 2	TIMING POINT 2
SCR PATTERN 3	TIMING POINT 3
SCR PATTERN 4	TIMING POINT 4
SCR PATTERN 5	TIMING POINT 5
ALL 1's SCR PATTERN	TEST PATTERN

FIG. 8
MEMORY MAP

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PRIOR ART
FIG. 3

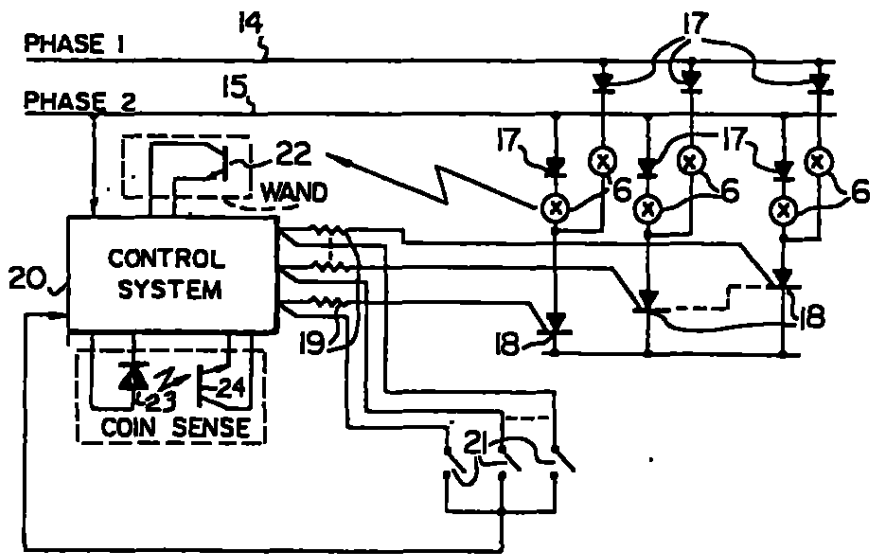


FIG. 4

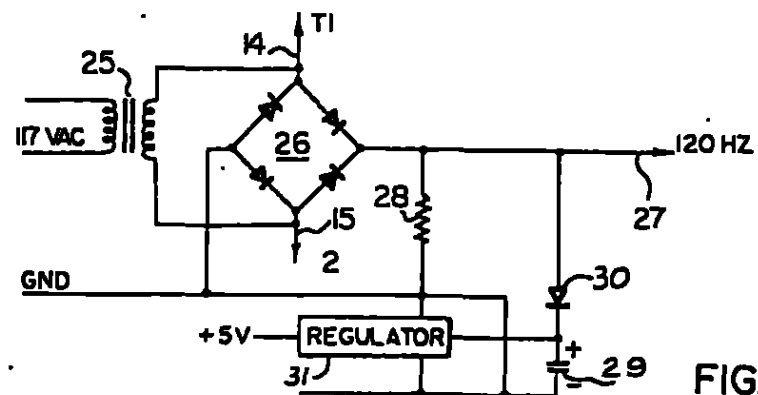


FIG. 5



FIG. 5A



FIG. 5B

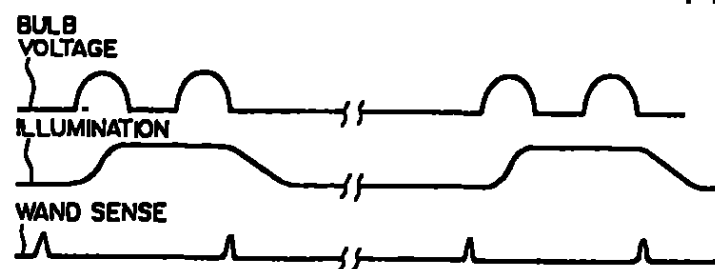


FIG. 6A

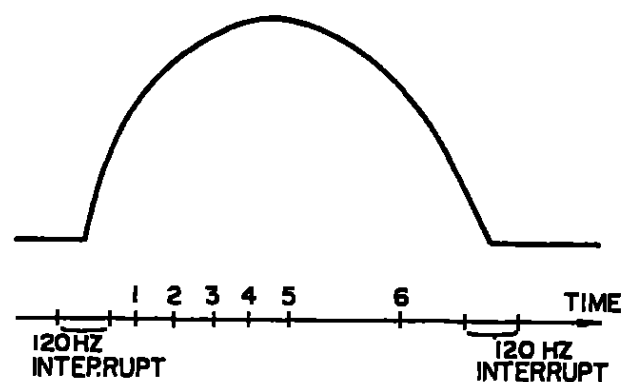
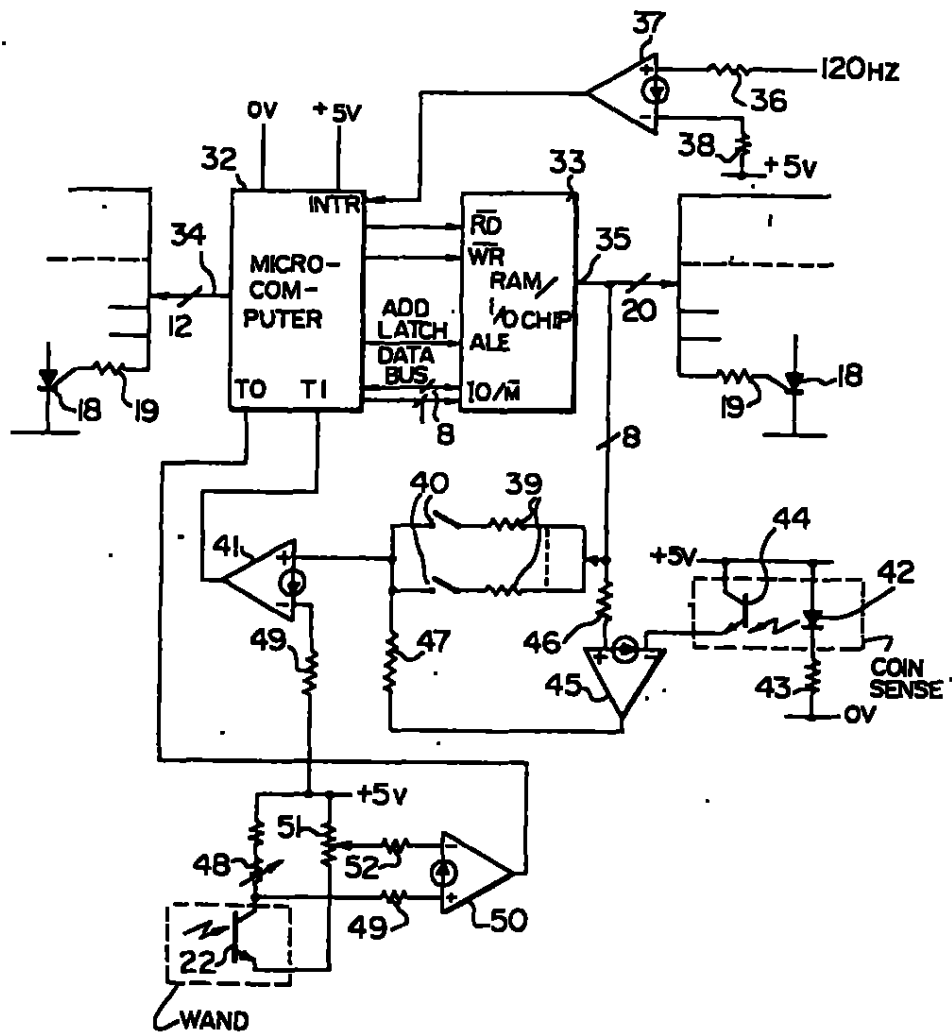


FIG. 7

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ELECTRONIC CANDLE SYSTEM

This invention relates to an electric simulated candle array and particularly to one in which each simulated candle can be lit without touching it or a switch associated with it. In addition all of the simulated candles which have been lit are able to flicker in a very realistic manner which simulates very closely the flickering of an actual candle.

Candle arrays are used in some churches, in association with memorials, etc. and are sometimes lit in association with the donation of money. For example, participants in a service who make a donation are allowed to light one of the candles of the array. It has been found, however, that the cost of candles has been increasing and often exceeds the value of the donation.

Further, arrays of candles which have been lit are usually allowed to burn completely, often overnight when the building has been deserted. Obviously this forms a fire hazard which raises the cost of fire insurance or renders a building uninsurable.

For the above reasons an array of light bulbs have been used in a simulated candle array, with a switch associated with each light bulb. Upon payment of a donation, the donator turns on a switch, illuminating the light bulb.

The procedure of operating a switch to turn on a light bulb instead of lighting a candle has been found to be unsatisfactory, since it detracts from the "mystic" of lighting and watching a candle. Consequently the use of light bulbs to replace candles has only been implemented where absolutely necessary.

The present invention provides an array of simulated candles, utilizing light bulbs, which allows the user to turn on any selected light bulb merely by pointing a wand close to the light bulb to be turned on, rather than turning on a switch. This has been found to be a significant advance over the manually switched apparatus described above. Further, the light bulbs are caused to flicker in a manner which simulates very realistically the flickering of candle flames, including the increase and decrease of the illumination of all of the light bulbs (or selected groups of light bulbs if desired) which are observable in an array of candles during random breezes encountered by the candles in a room.

The resulting simulating candle array has been found to be highly acceptable by users, and indeed, comments have been heard by users concerning a prototype model that the array is difficult to distinguish from a real candle array from any reasonable distance.

It will be clear that while the description of the invention below is directed to a simulated candle array, the principles can of course be directed to any decorative light array, e.g. as might be found on a memorial plaque, decorations in a theatre, etc.

The invention in general is a decorative light array comprising a plurality of light bulbs, a wand for manually pointing to a light bulb, apparatus for sensing which light bulb has been pointed to by the wand, and apparatus for lighting the light bulb upon the sensing having been completed.

More particularly, the invention is a simulated candle array comprising a plurality of light bulbs, mounted so as to look like an array of candles, apparatus for applying short bursts of current to the light bulbs so as to repetitively illuminate the light bulbs for short intervals in a predetermined sequence during a candle selection

process, a sensor to be manually brought into adjacency to one of the light bulbs, apparatus connected to the sensor for detecting at least one of the short intervals of illumination of one of the light bulbs caused by the short bursts of current, and apparatus for applying operating current to the one light bulb so as to light it visibly to the unaided eye upon the sensing having been completed.

According to one embodiment, apparatus is provided for applying operating current to the one and other light bulbs which may be visibly lit to the unaided eye during varying and random time intervals so as to give the one and other light bulbs the appearance of random flickering.

According to a further embodiment, apparatus is provided for further modulating the time intervals in unison so as to give the one and other light bulbs the appearance of a unified and varying intensity of flickering modulated with the random flickering, thus simulating the brightening and darkening effect of a breeze operating on an array of lit and flickering candles.

A better understanding of the invention will be obtained by reference of the detailed description below, with reference to the following drawings, in which:

FIG. 1 is a representative front view of an array of electric simulated candles,

FIG. 2 shows a wand used for illuminating the light bulbs,

FIG. 3 is a part schematic and part block diagram of an embodiment according to the prior art,

FIG. 4 is a part schematic and part block diagram of the preferred form of the invention,

FIG. 5 is a schematic diagram of a power supply used in the preferred form of the invention,

FIGS. 5A and 5B show wave forms of operating power at two points in FIG. 5,

FIG. 6 is a schematic diagram showing the content of one of the blocks of FIG. 4,

FIG. 6A is a waveform and timing diagram used to illustrate how a light bulb is sensed,

FIG. 7 is a timing diagram of a current cycle applied to a light bulb of the array, and

FIG. 8 depicts the memory content plan in one embodiment of the invention.

Turning first to FIG. 1, a stand 1 is shown on which an array of simulated candles 2 is fixed. Previously, the array would have been of actual candles, but in relatively recent times, simulated candles were substituted for actual candles. Each of the simulated candles was comprised of a cylindrical housing, often colored, within which a light bulb was located. Switches, one connected in series with a power lead to each light bulb were fixed to the stand, one switch being associated with each simulated candle. The user would manually turn on the switch, which illuminated the simulated candle. Sometimes a neon bulb was used which randomly changed position with time in an attempt to simulate a real candle flame.

A more sophisticated prior art embodiment, prior to this invention, used a simple electronic system to sense a switch closure and turn on an electronic switch (transistor) to the appropriate candle bulb. The electronic system incorporated a timer for each candle and a simple, but unrealistic, candle flickering effect. The system required the use of an expensive, high current, regulated supply to the candle bulbs.

In that system, shown in FIG. 3, a plurality of simulated candle bulbs 6 (i.e. 12 volt incandescent light

bulbs) are connected each with a common terminal to a line 7 carrying operating current. A source of DC power is supplied through a flicker circuit 8 to the line carrying operating current. Each of the candle bulbs is connected through the collector-emitter circuit of a transistor 9 to ground. The base (acting as a switch gate) of each of the transistors is connected to the ports of a control system 10, thus enabling conduction through the collector-emitter circuit of a transistor to light the bulb at the required time.

Further, the control system is connected to the flicker circuit 8 which causes it to modulate the regulated current to the candle bulbs in order to simulate flickering. The amplitude of the current flow is controlled by the control system 10.

Closure of one of the switches 11 enables the electronic system 10 to apply current to the base of a transistor associated with a light bulb which is itself associated with the switch which is turned on, thus passing current and allowing the candle bulb to turn on.

The above procedure operates after the electronic system 10 has detected that a coin has been inserted in a coin slot. This is simply done by a lamp 12 illuminating a photo-transistor 13 across a coin chute. Interruption of the light detected by the photo-transistor causes a pulse to be presented to the control system 10 via the photo-transistor, enabling it to detect subsequent closure of one of the switches 11.

It is clear that in the system just described a switch must be turned on for each light bulb which is operated. Further, the flicker circuit causes all of the candle bulbs to flicker in unison, which has been found to be not as realistic as my invention to be described below. Also the flicker circuit requires a heavy duty regulated supply for the candle bulbs which increases the expense, weight and heat generation of the electronic system.

According to the present invention, the simulated candle is used as before, but there is no manually operated switch associated with each candle. Instead, a wand as shown (enlarged) in FIG. 2 is used. The tip of the wand is brought into close adjacency to the candle, and as a result that candle visibly lights. All lit candles are caused to flicker, simulating an actual candle, as will be described later.

The wand is comprised of a plastic tube 3, with a photosensor 4, such as a photo-transistor glued to one end of the tube. Two wire conductors 5 pass through tube 3 and is connected to the two terminals of photo-transistor 4. Conductor 5 leads to a control apparatus as will be described later.

FIG. 4 shows the preferred embodiment of the present invention. A pair of lines 14 and 15 carries opposite phases of half wave rectified power which is derived from a 60 cycle source. Pairs of light bulbs 6, each in series with a diode, are connected in series with individual silicon controlled rectifiers poled in the same direction as the diode to separate lines 14 and 15.

Enable ports of an electronic control system, adapted to detect the phase of the operating current lines, is connected through resistors 19 to individual gates of the silicon controlled rectifiers 18. Thus the control system 20 applies signals to the gates of silicon controlled rectifiers 18 during the appropriate phases of the power applied to lines 14 and 15, causing power to pass through the appropriate light bulb of each pair during the corresponding current phase, should a particular light bulb be required to be illuminated.

It is clear, therefore, that the number of silicon controlled rectifiers which operate as electronic switches for each of the light bulbs is reduced by one-half over the number of normal and/or transistor switches which would otherwise be required on a one-to-one correspondence. Also there is no requirement for a heavy duty regulated supply to the candle bulbs. The only component required is an inexpensive high current bridge.

It is desired in the present invention to apply operating power to all of the light bulbs during an interval which is a small (the last) portion of each current cycle of the related phase of operating power. The interval is selected so that it is virtually invisible to the unaided human eye. The current which passes through the light bulb generates heat, raising the resistance of the light bulbs, and limits the in-rush current which would shorten the life of the light bulbs when they are to be turned visibly on. This substantially increases the life of the light bulbs.

According to a further feature of the present invention, a plurality of system control switches 21 each has one terminal connected to a corresponding gate enable port of control system 20 leading to the gates of the separate silicon controlled rectifiers 18. The other terminal of each of the control switches 21 is connected in common with the others to a sense input of control system 20. During a short interval around the zero point of the operating current for the light bulbs, when the anode-cathode voltage is insufficient to sustain operation, the state of one of the control switches is sensed. Over a series of cycles, the states of all of the system control switches are sensed in succession.

In the preferred embodiment, the ports are successively pulsed at successive zero crossing points of the operating current cycles, and the closed or open state of the pulsed control switch 21 is sensed by the control system at its sense input. Since there is no anode-cathode operating power at the time of the pulse, the presence of pulses at the gates of the silicon controlled rectifiers do not cause them to fire indiscriminately (the current supply in the anode-cathode circuits of the silicon controlled rectifiers being zero).

Clearly the above structure eliminates the requirement for separate control switch ports of the control system 20.

A photo-transistor 22, which corresponds to the photosensor 4 at the end of tube 3 is also connected to control system 20. According to the preferred form of the invention, upon detection of a coin or bill in the coin chute, the light bulbs 6 are operated in sequence over very short time intervals to emit light which is detectable by photo-transistor 22. Since the illumination of the light bulbs 6 is caused by the enabling of a gate of a corresponding silicon controlled rectifier 18 by control system 20 over predetermined time intervals, the timing of the light associated with each bulb is known, and thus the sensing of the light presence during a particular interval by the photoresistor designates which light bulb is to be visibly lit.

In this embodiment two successive half cycles of half wave rectified power should be applied to each light bulb 6 in sequence, which has been found to be sufficient for detection, yet not immediately discernible to the unaided eye. The photo-transistor 22 can be scanned in a similar manner as the system control switches.

A light emitting diode 23 which is light coupled to a photo-transistor 24 across a coin chute can be used to

detect the presence of a coin, photo-transistor 24 being scanned similar to control switches 21. Once a coin has been detected, the control system can be enabled to operate the scanning sequence previously described and to monitor light sensor phototransistor 22.

Turning now to FIG. 5, the preferred form of power supply is shown for providing operating power, etc., to the system. A transformer 25 has its primary winding connected to a standard 60 cycle 117 volt AC supply, the secondary of transformer 25 providing operating current at a lower voltage, such as 14 volts. A bridge rectifier 26 is connected across the secondary winding of the transformer, the output of the bridge rectifier providing full wave (120 Hertz) current on lead 27. A bleeder resistor 28 is connected across the output of the rectifier from lead 27 to ground.

A large capacity filter capacitor 29 is connected through a diode 30 to lead 27, and to a standard 5 volt regulator 31 to provide a 5 volt DC supply lead for the control system 20.

Half wave oppositely phased operating current is provided between each of the leads of the secondary winding of transformer 25 and ground, the leads being designated by reference numerals 14 and 15. The timing of the half wave rectified current signals on leads 14 and 15 are shown in FIGS. 5A and 5B. Each of the current waveforms is used to operate the separate light bulbs 6 of each pair of bulbs shown in FIG. 4.

Turning now to FIG. 6, the control system 20 of FIG. 4 is preferably formed of a single chip micro-computer 32 such as the type 8748, connected in a conventional manner to a RAM/IO chip 33 type 8155. Twelve output ports 34 are available from the single chip computer 32 and twenty ports 35 are available at the output of the RAM/IO chip 33. Each of the ports 34 and 35 is connected to a gate of a silicon controlled rectifier 18 (through a resistor 19), thus operating as many as thirty-two silicon controlled rectifiers and sixty-four candle simulating light bulbs.

The full wave rectifier signal on lead 27 (FIG. 5) is applied through a resistor 36 to the non-inverting input of operational amplifier 37 (the inverting input being connected through resistor 38 to +5 V), the output of operational amplifier 37 being connected to the INTR input of micro-computer 32. This supplies the zero crossing point information to the micro-computer.

Seven of the output ports 35 are individually connected via resistors 39 in series with control switches 40 to the non-inverting input of operational amplifier 41. The output of operational amplifier 41 is connected to one of the input ports T1 of micro-computer 32. The other input of operational amplifier 41 is connected to the +5 V power supply terminal via resistor 49 to provide a constant current bias.

The micro-computer is programmed so that at the zero crossing point of the 60 Hertz operating power, each of which point is indicated by the full wave rectified (120 Hertz) signal appearing at the input of operational amplifier 37 being applied to the micro-computer 32, successive output ports of the RAM/IO chip 33 which lead to switches 40 are pulsed. Should any of the switches 40 be closed, a pulse at input T1 of micro-computer 32 occurs at the time of pulsing of the associated port. Thus the presence of a closed control switch is indicated.

A light-emitting diode 42 is connected in series with resistor 43 between +5 V and ground (or zero V), which causes it to be illuminated. The light-emitting

diode is placed on one side of a coin chute and a photo-transistor 44 on the other. Consequently when a coin is placed in the coin chute it interrupts the light beam for a short period.

The photo-transistor 44 is connected between +5 V and the inverting input of an operational amplifier 45, which has its non-inverting input connected to one of the output ports of RAM/IO chip 33 through resistor 46. The port connected to the non-inverting input is pulsed positively to a level of +5 V or higher each scanning cycle, in sequence with the control switches 40. If the light from light-emitting diode 42 falls on photo-transistor 44, the photo-transistor is conductive and the output of operational amplifier 45, is held at a low voltage level, thus inhibiting the pulse from RAM/IO chip 33. However should the light from light-emitting diode 42 be blocked by a coin, the scanning pulse passes through operational amplifier 45 through a resistor 47 which is connected to its output and appears at the non-inverting input of operational amplifier 41, the output of which is sensed by microcomputer 32 and the computer thus determines that the lighting of a light bulb is to follow. It thus commences the sequential scanning of the light bulb (described earlier) and monitors input port T0 to which the light bulb sensing photo-transistor is connected as will be described below.

A photo-transistor 22 is connected in series with a sensor gain control potentiometer 48 between +5 V and ground. The junction of photo-transistor 22 and potentiometer 48 is connected through a resistor 49 to the non-inverting input of operational amplifier 50. A threshold setting potentiometer 51 is also connected between +5 V and ground, its tap being connected via resistor 52 to the inverting input of operational amplifier 50. The output of operational amplifier 50 is connected to the T0 input of micro-computer 32.

Thus when the photo-transistor light sensor 22 is brought into adjacency to one of the light bulbs during the sequential scanning procedure described earlier, it detects the very short light bursts described earlier and causes a pulse during the illumination interval to pass through operational amplifier 50, which pulse is applied to the T0 input port of micro-computer 32. This port is checked at predetermined timing points similar to the checking of switches 40 for the presence of the pulse, and should the pulse be detected, assuming that the scanning procedure has been initiated due to the detection of the presence of the coin, the computer enters a software routine to illuminate the appropriate light bulb as will be described below.

FIG. 6A shows timing diagrams related to the short illumination burst of the light bulb. In the top figure, the current which is to be applied to each light bulb in succession is shown. As indicated earlier, it is preferred that two successive half-wave rectified pulses should be conducted through each bulb, by enabling the associated silicon controlled rectifier at the proper times. Consequently two half wave current pulses are applied to the first light bulb followed by two pulses to the next, etc. and after all the light bulbs have been pulsed, the cycle begins again.

As shown in the middle diagram in FIG. 6A, a particular light bulb illuminates shortly following the beginning of the first half cycle, then remains illuminated due to its inherent time lag through the remainder of the first pulse, the gap between the two pulses, and it remains illuminated for some time after the completion of

the second pulse. Thus a suitably long illumination period is created for each light bulb.

The bottom waveform in FIG. 6A indicate the time interval during which the state of the photo-transistor 22 is checked. Clearly the second checking interval from the left detects the presence of illumination. However if the phototransistor is not near a light bulb it of course will not detect any of the light flashes, and no light bulb, except those already previously selected, will be turned on.

When the first light pulse has been detected a second pulse is initiated several cycles later. The detection of this second pulse initiates the "lighting" of the chosen candle. The second pulse serves as an error check to prevent accidental lighting of a "darkened" bulb in the case of rapidly passing the wand over a light source (such as an already illuminated candle) at the same moment that the "darkened" bulb generates a light pulse.

Turning now to FIG. 7, a half cycle current waveform and timing diagram is shown which will be used to illustrate more fully the concepts of the invention. The top waveform is one-half of a 60 Hertz signal, of the type which appears on either of the lines 14 and 15. Below the waveform is shown a timing diagram. Adjacent the zero points of the half cycle of current a pair of interrupt intervals are shown. During those periods, the silicon controlled rectifiers are non-conductive.

Turn-on time points labelled 1-6 during the interval of the half cycle are also shown, in approximate time scale. These time points are used to trigger the silicon controlled rectifiers conductive as will be described below.

All of the silicon controlled rectifiers are triggered at timing point 6 at the latest. Consequently current having the form of the remainder of the half cycle of operating power from timing point 6 to the interrupt period is passed through the light bulbs. This keeps the filaments of the light bulbs warm and limits in-rush current when lights are visibly turned on.

It should be noted that all "darkened" light bulbs connected to line 14 conduct current at timing point 6 for the remaining duration of one phase of 60 cycle current as described above, and all light bulbs connected to line 15 conduct current from a similar timing point 6 in the immediately following phase. Pairs of light bulbs connected to one silicon controlled rectifier are connected one bulb to each line 14 and 15 as described earlier. Each silicon controlled rectifier is enabled during the appropriate periods of all phases.

In order to provide a pulse of light for detection by the photo-transistor sensor 22 (when a coin or bill is detected in the coin chute), each "darkened" light bulb in succession is caused to conduct additional current, for a period of two successive half cycles of the phase of current which it is connected to conduct, from timing point 1 to the following interrupt period. Consequently nearly the entire rectified current pulses for two half wave cycles are used.

Once a light bulb is indicated to be turned on visibly, rather than switching it on at timing point 6, it should be switched on at timing point 5 at the latest. However, it should alternatively be turned on at one of the earlier turn-on time points, the time points 1-4 being selected randomly. The switch point decision is preferably made by the output of a random number generator program in micro-computer 32. In one embodiment, the random number comprised of four bits is used to control the

four switch points for each light bulb individually. The result is a randomly changing light bulb brightness which changes at the rate of rotation of the random number generator. The effect is very similar to that of a candle flickering in a strong breeze.

In order to reduce the amount of flickering, fewer than the four switch points can be used in the random selection procedure. To selectively reduce the amount of flickering, all of the selected bulbs to be illuminated are switched on at switch point 4, with random selection of switch points 2 and 3. A further reduction can be obtained by turning on the bulbs at switch point 3 and randomly selecting switch point 2. Consequently the change between no flickering and full flickering can be simulated by incrementing, or decrementing, the number of switch points used in the flicker effect. The number of switch points can be determined by a binary mask which sets to a logical "1" those switch points not to be randomly selected. If the mask is rotated left and right one rotation at a time, then the flickering will decrease and increase depending on the rotation direction. In the preferred system the mask is rotated every few seconds, but the actual time the mask is rotated is random (selected from the random number generator). The rotation direction is determined from a pre-stored cyclic pattern.

The effect of the random selection of the switch-on timing points described above provide the simulation of a candle flickering. However the random selection of the last allowable turn-on point provides the simulation of the effect of a breeze affecting all of the candles (or groups of candles if controlled in that manner).

A preferred memory map which can be used for the RAM/IO chip 33 and the micro-computer is shown in FIG. 8. The memory is 16 bytes wide. One-half of the memory is used to retain timer information for the period that a particular light bulb should remain visibly on.

Five successive byte locations store the silicon controlled rectifier timing patterns, i.e., the pattern for timing point 2, 3, 4 and 5, at successive memory locations. A test pattern can also be stored, which can be accessed by closure of one of the control switches 40.

It was noted earlier that an operational amplifier 50 provides an output pulse when the light detected by photo-transistor 22 is above a threshold set on potentiometer 51. However it has also been found that the brightness of the light required at the light bulbs for detection by the sensor can be reduced by the use of an 8-bit A/D converter in place of the operational amplifier 50 and its associated circuitry. This allows the micro-computer to determine that the photo-transistor sensor is stationary, that the photo-transistor is adjacent an unlit light bulb, to select the light bulb with a low flickering brightness, and to perform the above at various levels at ambient brightness. A very fast scanning procedure can also be used in this case in order to select a light bulb for illumination.

With a lower flicker brightness level several bulbs can be turned on at once without an adverse visual effect which could occur at higher flicker light levels which would be required for detection of a selected bulb in high ambient light conditions. In that case a successive approximation type procedure preferably is used by the micro-computer to determine the selected bulb. In this procedure an iterative selection procedure is used in which the bulbs are divided first into two groups, then four groups, and so on. The chosen fraction at each step of iteration is the one with the selected

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bulb in it as determined by the response of the sensor. The selected bulb is then reached after $\log_2 N$, where N is the number of candles, and the result being rounded up to the next integer. This considerably reduces the time taken to search for the selected candle.

As an example, if 64 candles are used, the successive approximation procedure takes only six steps in contrast to 64 steps using the scanning procedure described earlier.

To facilitate a lower flicker level brightness for the selection procedure just described, each bulb need only be turned on for one-half cycle, rather than two half cycles. This provides an extra factor of speed over the embodiment described earlier. An apparently instantaneous selection is thus facilitated.

A flow chart of the program for the micro-computer is shown in appendix A, parts A, B and C. Each of the steps of the flow chart is labelled as to function and is believed to be self-explanatory to a person understanding this invention and understanding programming of micro-computers. The operation of the control system described above can of course alternatively be provided using dedicated logic in place of the micro-computer. The algorithm for its operation is contained in the description above.

It should be noted that this invention contemplates that rather than the wand containing a photosensor, each of the light bulbs can utilize photosensors placed in adjacency and the wand can contain an illuminated light bulb at its tip. The control circuitry is connected to the photosensors, and sense the light bulb from the wand during particular sensor scanning intervals, when the wand tip is brought near a photosensor. A determination of the time of scanning of the sensor which picks up the light facilitates deduction of which light bulb has been selected for illumination. In this case, of course, the light bulbs are not pulsed on for the selection process as described earlier; this embodiment provides the inverse structure with the light bulb in the wand. Care must be taken to ensure that ambient light does not give a false selection indication.

Of course, the candle simulating flickering aspect of this invention can also be used with electrostatic "touch" switching of a selected simulated candle, or with the basic manually operated switch system found in currently marketed systems.

It will be understood by a person skilled in the art understanding this invention that variations and other embodiments may be designed, using the principles described herein. All are considered to be within the sphere and scope of this invention as defined in the claims appended hereto.

I claim:

1. A decorative light array comprising:
 - (a) a plurality of light bulbs,
 - (b) a wand for manually pointing to a light bulb,
 - (c) means for sensing which light bulb has been pointed to by the wand, and
 - (d) means for lighting the light bulb upon said sensing having been completed.
2. A simulated candle array comprising:
 - (a) a plurality of light bulbs, mounted so as to look like an array of candles,
 - (b) means for applying short bursts of current to said light bulbs, so as to repetitively illuminate light bulbs for short intervals in a sequence during a candle selection process,

(c) a sensor to be manually brought into adjacency to one of said light bulbs,

(d) means connected to said sensor for detecting at least one of said short intervals of illumination of said one of said light bulbs caused by said short bursts of current, and

(e) means for applying operating current to said one light bulb so as to light it visibly to the unaided eye upon said sensing having been completed.

3. A simulated candle array as defined in claim 2, including means for randomly modulating the operating current so as to give said one and other lit light bulbs the appearance of flickering.

4. A simulated candle array as defined in claim 2, including means for applying operating current to said one and other light bulbs visibly lit to the unaided eye during varying and random time intervals so as to give said one and other light bulbs the appearance of random flickering.

5. A simulated candle array as defined in claim 4 including means for further modulating said time intervals in unison so as to give said one and other light bulbs the appearance of an unified and varying intensity of flickering modulated with the random flickering, thus simulating the brightening and darkening effect of a breeze operating on an array of lit and flickering candles.

6. A simulated candle array as defined in claim 4 including means for applying half wave rectified operating current to said light bulbs, gate controlled switch means connected in series with said light bulbs, control means for applying control signals to the gates of the switch means for enabling the switch means in sequence for said short intervals, said sensor being comprised of a light sensor, said means for applying operating current including means for applying said operating current during predetermined intervals of serial half waves of said rectified current.

7. A simulated candle array as defined in claim 6 in which the gate controlled switch means is comprised of silicon controlled rectifiers, means for providing lines carrying alternate phases of half wave rectified current for illuminating said light bulbs, pairs of said light bulbs being connected to opposite phased ones of said lines, each bulb of a pair of light bulbs being connected in series with a diode and both being connected to a silicon controlled rectifier forming said switch means and poled in the same direction as the diodes and in conductive direction relative to the phase of the operating current, the control means including means for detecting which phase of operating current is being applied to said lines.

8. A simulated candle array as defined in claim 7 further including a plurality of ports for carrying said switch control signals, a plurality of control switches for controlling said control means connected to said ports, and means for sequentially scanning the operation of said control switches during intervals encompassing successive zero crossing points of an alternating voltage associated with said half wave rectified current, the voltage of said latter intervals being insufficient to operate said silicon controlled rectifiers.

9. A simulated candle array as defined in claim 8 in which said sensor includes a semiconductor which conducts current in excess of a predetermined threshold in the presence of a light, and including means for connecting the output of said semiconductor to an input of

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said control means for scanning the semiconductor current in sequence with said control switches.

10. A simulated candle array as defined in claim 2, 6 or 9 in which said light bulbs are incandescent, and means for applying repetitive short bursts of current to all of said light bulbs not otherwise conducting current for intervals virtually unseen to the unaided eye for generating heat in said light bulbs thereby increasing their resistance whereby any subsequent in-rush current thereto will be limited.

11. A simulated candle array as defined in claim 4, further including means for applying half wave rectified operating current to said light bulbs, said control means including random number generator means, and means for enabling application of said operating current to said light bulbs during periods of said half wave operating current depending on a number generated by said random number generator means.

12. A simulated candle array as defined in claim 11 in which said periods of said half wave current are comprised of a predetermined final portion of a sinusoidal half wave current pulse applied to said light bulbs to which is added an adjoining portion of the same current pulse, the time period of the adjoining portion being randomly varied according to a number generated by the random number generator, each being different for at least the majority of said light bulbs.

13. A simulated candle array as defined in claim 12 including means for varying the period of said predetermined final portion to a time interval which is more than half of the time interval of the half wave current pulse, said predetermined final portion being similar for all or a substantial number of said light bulbs.

14. A simulated candle array as defined in claim 13 including gate controlled switch means connected in series with said light bulbs, control means for applying control signals to the gates of the switch means for enabling the switch means in sequence for short said intervals, said sensor being comprised of a light sensor, said means for applying operating current including means for applying said operating current during predetermined intervals of serial half waves of said rectified current.

15. A simulated candle array as defined in claim 14 in which the gate controlled switch means is comprised of silicon controlled rectifiers, means for providing lines carrying alternate phases of half wave rectified sinusoidal current for illuminating said light bulbs, pairs of said light bulbs being connected to opposite phased ones of said lines, each bulb of each pair of light bulbs being connected in series with a diode and both being con-

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nected to a silicon controlled rectifier forming said switch means and poled in the same direction as the diodes and in conductive direction relative to the phase of the operating current, the control means including means for detecting which phase of operating current is being applied to said lines.

16. A simulated candle array as defined in claim 15 further including a plurality of ports for carrying said switch control signals, a plurality of control switches for controlling said control means connected to said ports, and means for sequentially scanning the operation of said control switches during intervals encompassing successive zero crossing points of an alternating voltage associated with said half wave rectified current, the voltage of said latter intervals being insufficient to operate said silicon controlled rectifiers.

17. A simulated candle array as defined in claim 16 in which said sensor includes a semiconductor which conducts current in excess of a predetermined threshold in the presence of a light, and including means for connecting the output of said semiconductor to an input of said control means for scanning the semiconductor current in sequence with said control switches.

18. A simulated candle array as defined in claim 2, 6 or 11 further including means for detecting the presence of a coin at a predetermined physical location, and for enabling the means for generating and detecting said short intervals of illumination upon detection of the presence of said coin.

19. A simulated candle array comprising:

- (a) a plurality of light bulbs,
- (b) means for applying cyclic operating current to said light bulbs,
- (c) means for modulating the timing of said current whereby said current is carried by said light bulbs during at least a predetermined portion of each cycle of said current, and
- (d) means for randomly extending the period of application of said current during each cycle differently and separately to a major portion of said light bulbs to provide the appearance of random flickering of said bulbs.

20. A simulated candle array as defined in claim 19, including means for randomly extending and reducing the timing of said predetermined portion of said current to at least said major portion of said light bulbs together, to provide the appearance of the general increase and decrease of light effected by a breeze acting on a plurality of candles together.

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United States Patent [19]
Goldstein et al.

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 [43] **Dec. 4, 1979**

[34] **ELECTRONIC VOTIVE LIGHTS**

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[52] **U.S. Cl.** 315/312; 315/360; 307/141; 361/195

[58] **Field of Search** 315/312, 313, 360; 340/309.1; 307/141; 361/195, 196, 202

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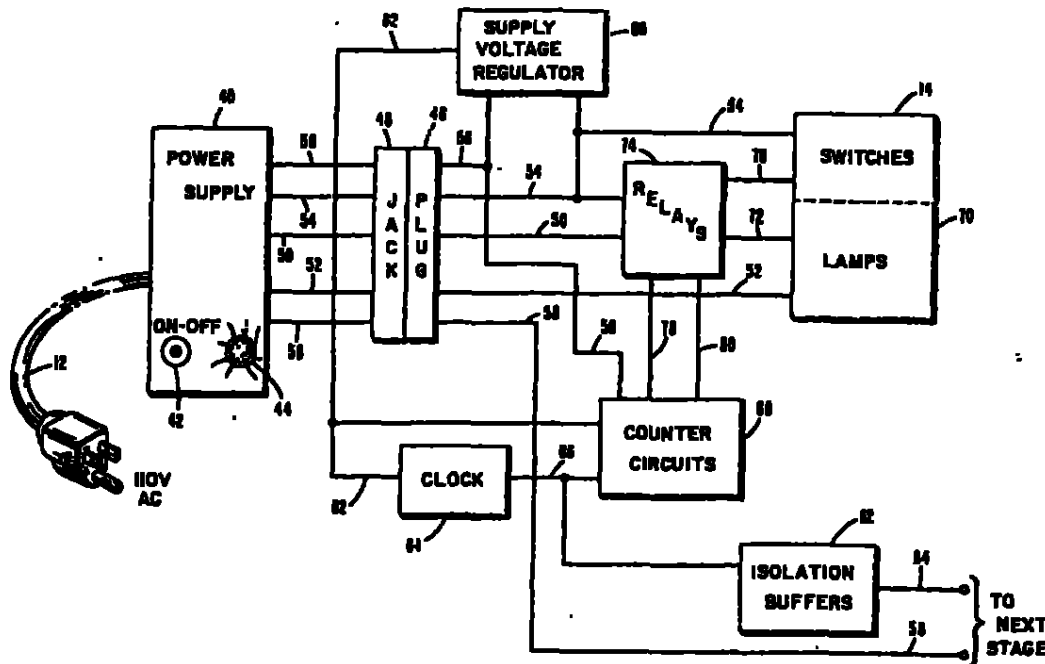
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Primary Examiner—Eugene R. LaRoche
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Attorney, Agent, or Firm—Melt & Jacobson

[57] **ABSTRACT**

Electronically timed and electrically operated lamps are utilized in place of traditional candles. Actuation of a switch, located on each lamp holder, illuminates that lamp for an accurately timed predetermined period. One clock is utilized to drive a plurality of independent timers, each associated with an individual lamp. The lamp units are provided with the capability of being plugged into the timing unit, so as to permit interchangeability.

9 Claims, 8 Drawing Figures



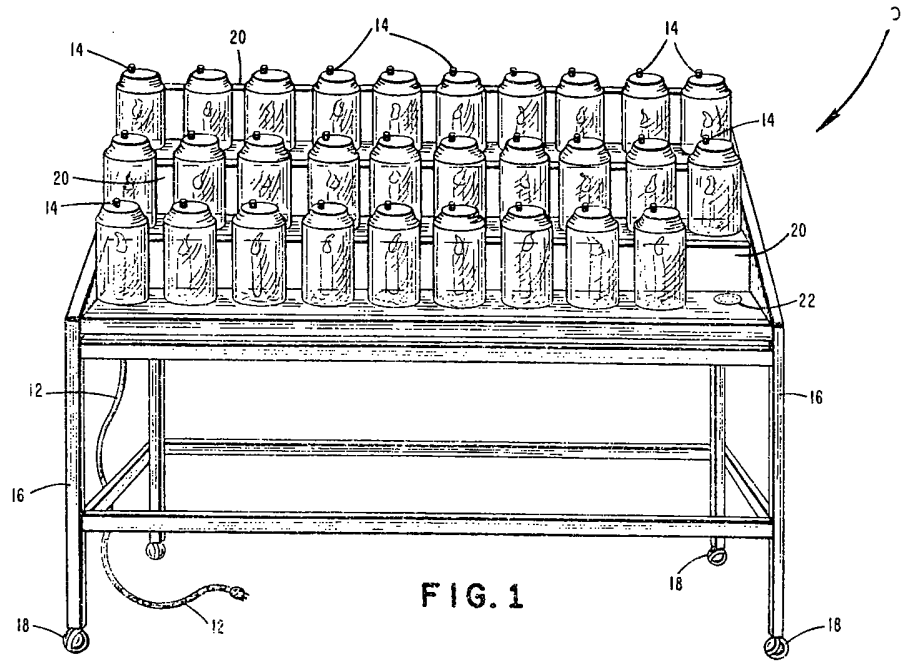


FIG. 1

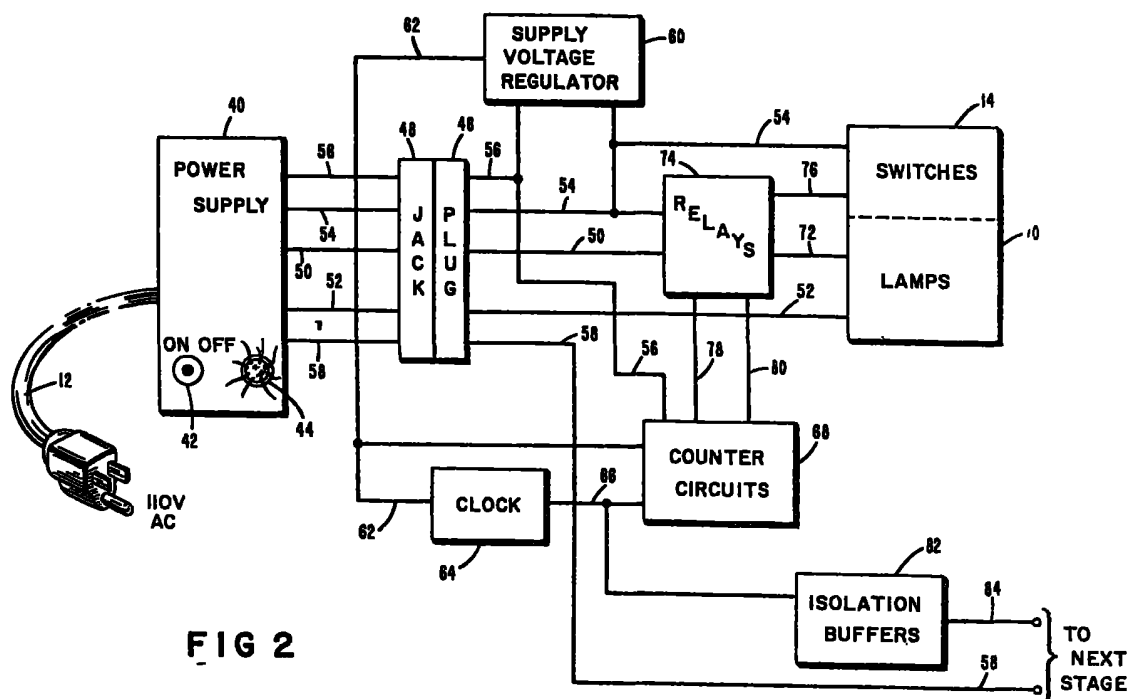
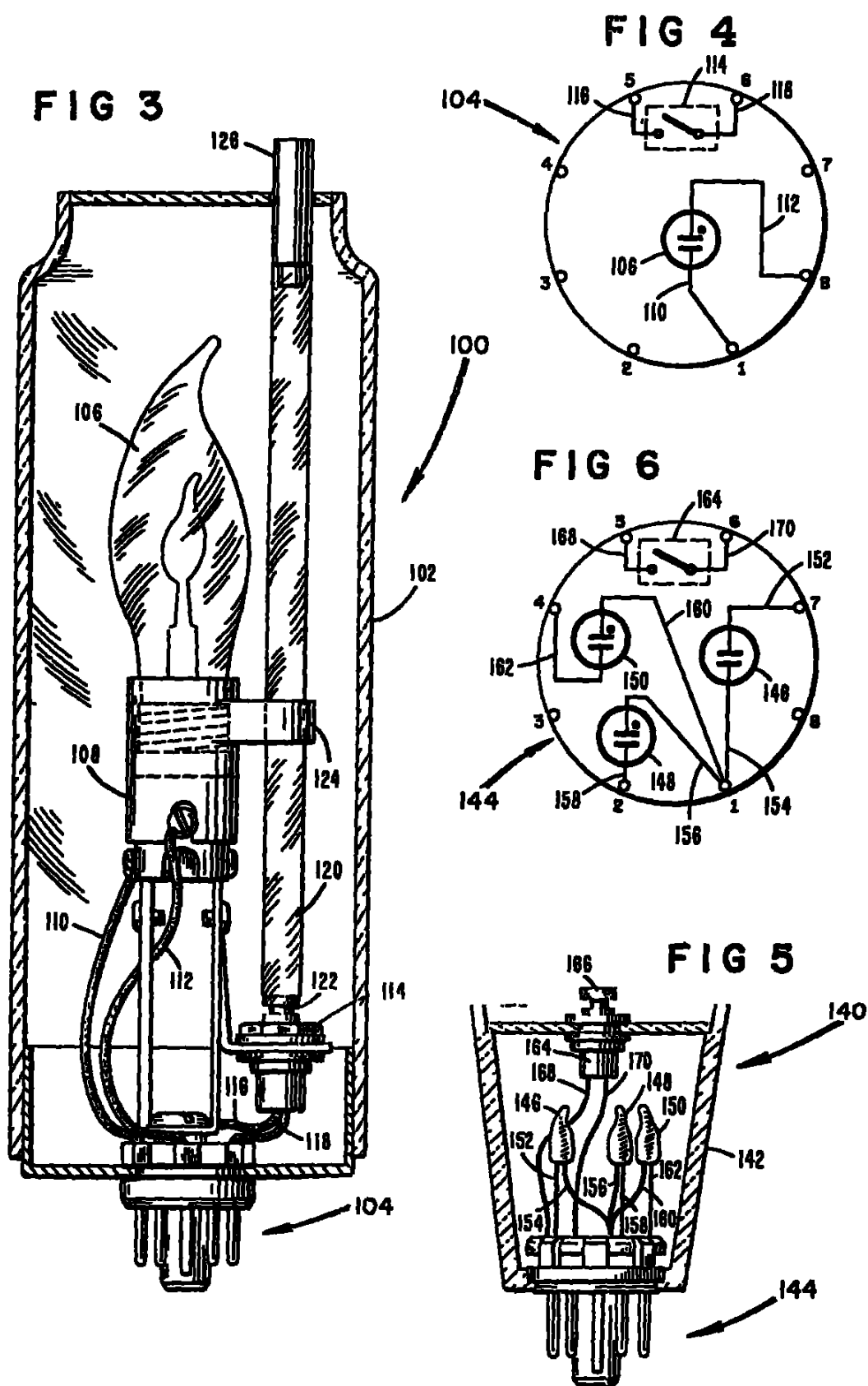
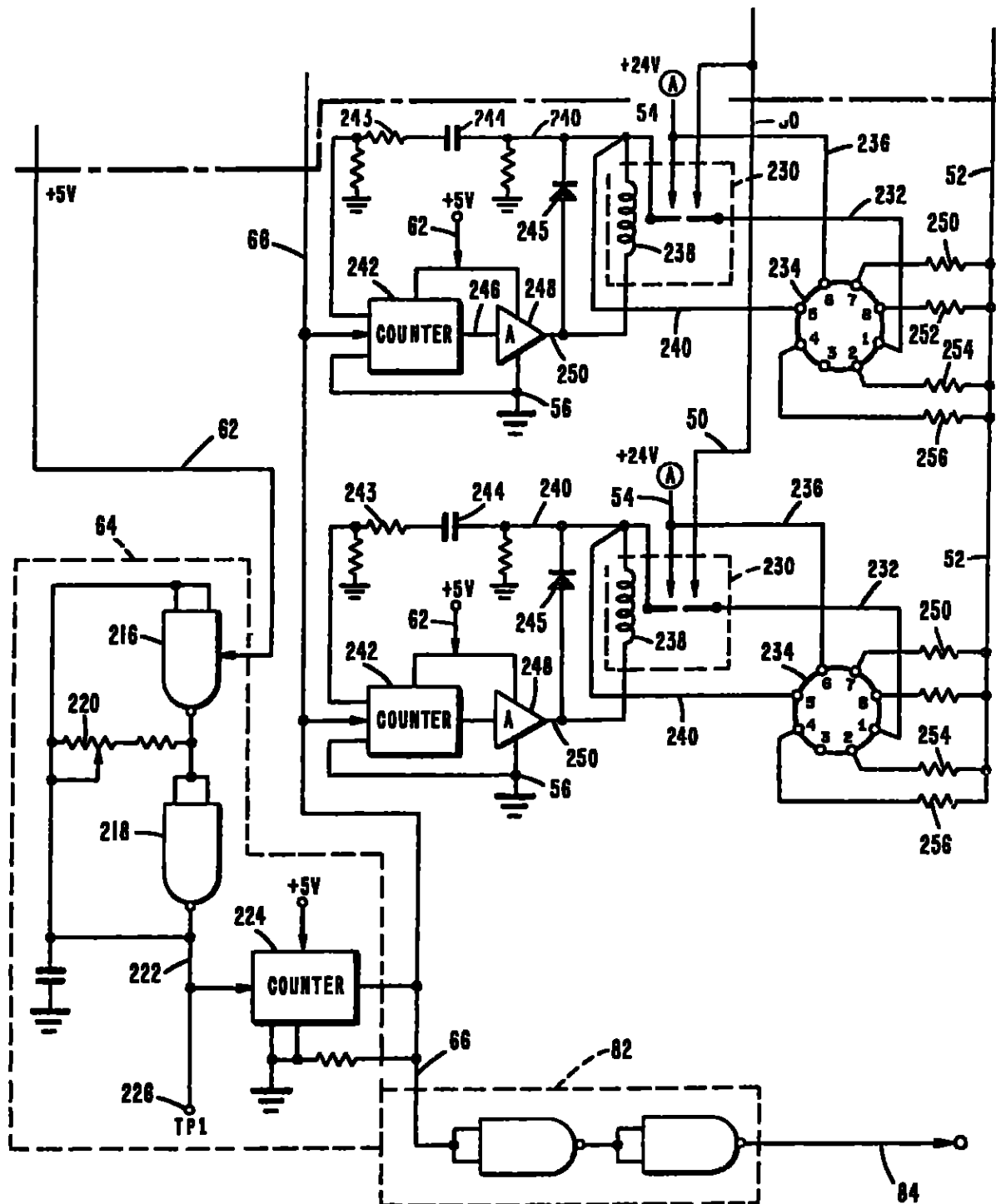


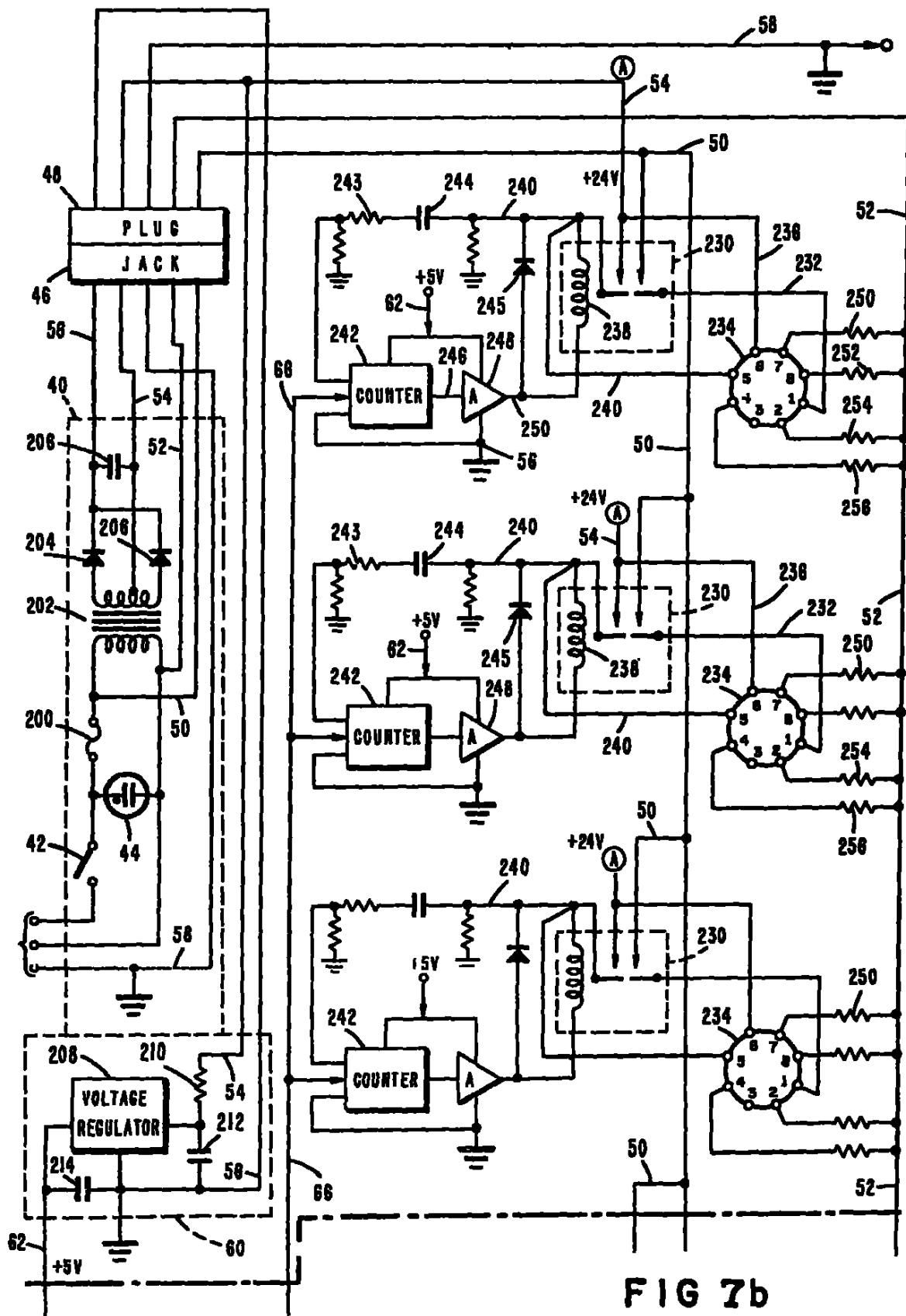
FIG 2



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FIG 7a





The individual candle holders are arranged in rows and mounted on a framework 16 which may be formed of aluminum and may be gold anodized so as to present an esthetically pleasing appearance. Moreover the framework 16 may be mounted on castors or rollers, shown typically 18 to provide movable or portable array which will facilitate cleaning and/or relocation. The framework 16 is provided with housings 20 which extend from side to side in the framework 16, each of which is associated with a row of lamps. In these housings 20 is located the electronic timing circuit provided by the present invention. The view of FIG 1 shows one of the invention lamp assemblies having been unplugged from the array and accordingly the empty socket 22 is seen. It is understood of course, that each of the inventive votive lamps is plugged into a socket identical to socket 22.

FIG 2 shows the electronic and electrical elements provided by the present invention in block diagram form. The present invention is intended to operate with conventional household current and accordingly the power cord 12 is intended to be plugged into a standard 110 volt, 60 cycle line. The power cord 12 is connected to a power supply 40 which will provide the necessary voltages, which are more readily usable in electronic circuits. The power supply 40 is provided with an on/off switch 42 and a pilot lamp 44, which indicates that the unit is in operation. Although the power supply and other circuitry will be shown in more detail below at this time it is sufficient to note that the power supply provides as outputs to a conventional plug 46 and jack 48 connector an output on lines 50 and 52 which comprises the input AC voltage and on lines 54 and 56, a 24 volt DC voltage. The other output from the power supply 40 on line 58 represents an earth ground connection as provided by a conventional three-pronged electrical plug.

The input AC power on lines 54 and 56 is fed to a supply voltage regulator unit 60 which provides an extremely well-regulated voltage and specifically provides a five volt positive voltage on line 62 which is fed to a clock unit 64. The clock unit 64 produces a pulsed signal on line 66 which is fed to the counter circuits 68 one of which is associated with each individual votive lamp. The counters 68 serve to count the clock pulses on line 66, thereby controlling the period of illumination for the particular lamp.

As seen in FIG 1 the lamp and switch are formed in a single unit and accordingly the lamps 70 are shown associated with the switches 14. The lamps receive suitable energization voltages on line 52 which is one side of the AC line from the power supply and from a connection on line 72 to the relays 74, which is the other side of the AC line. Similarly the switches 14 are connected to the relays by line 76 and are in the power circuit by means of the connection to line 54 from the power supply. Because a relay and counter form a unit which is associated with each individual lamp, the relays unit 74 is connected to the counters unit 68 by lines 78 and 80.

As seen in FIG 1 the present invention is intended to utilize more than one bank of votive lamps and switches i.e. the array contains additional rows of lamps. Accordingly the earth ground on line 58 is fed to the succeeding stage and the clock signal on line 66 produced by the clock 64 is fed to an isolation buffer unit 82 of the well known type, before the clock signal is then fed to the next successive stage on line 84 where

it will be fed into a counter unit identical to counter unit 68.

The operation of the inventive electronic votive lights will now be discussed in relation to FIG 2. After the power supply 40 has been suitably connected and is producing the desired 24 volts DC on lines 54 and 56 the supply voltage regulator 60 will be producing the well regulated five volts DC. This voltage when fed to the clock 64 causes a low frequency pulsed signal to be produced on line 66. At this time, the present invention is considered to be in a ready condition or waiting condition in other words, none of the lamps are illuminated and no timing or counting is taking place, although the low frequency clock signal is available to be counted. The switches 14, which are provided in the present invention are of the momentary-contact push button type and upon depression of one of such switches, a voltage on line 76 will cause one of the relays 74 to close its normally-open contacts, thereby energizing the coil of the relay and keeping a first normally-open switch closed. This maintains the voltage across the relay coil which was initiated by the momentary-contact, push button switch 14 and also closes another normally-open contact in the relay which puts a voltage corresponding to the input AC on line 50 on line 72 which is fed to the lamps 70 thereby energizing the lamp by the voltage appearing across lines 72 and 52. Simultaneously with the illumination of the lamp one of the counters 68 is energized by the voltage across the relay coil and begins counting the pulsed clock signals on line 66. Upon reaching a predetermined count, the counter in a manner which will be described in more detail below will alter the voltage drop appearing across the relay coil thereby causing the relay to drop out and the normally-open contacts to open and remove the voltage from the specific lamp. It is understood of course that each of the switches will when depressed energize the appropriate relay which will then cause the appropriate lamp to be illuminated and the counter to begin counting the clock signal from the clock unit. Since the present invention requires only one power supply one supply voltage regulator and one clock for producing accurately timed clock pulses the pulsed signal isolated by means of the buffers 82 and fed to the next successive stage which also consists of relays counters and the plug in lamp units. These successive units function exactly as the unit described above.

With reference to FIG 3, a typical plug in unit 100 is shown in the style traditionally used for a seven day votive candle. In other words, the outer lamp holder 102 is exactly the same configuration as the traditional glass candle holder. In the embodiment, shown in FIG 3, the outer lamp holder 102 is formed of red transparent plastic, thereby providing an easy manufacturable product while not differing appreciably from the traditional glass votive candle holder. For ease of description the outer candle holder 102 is shown having a portion cut away.

Each of the individual lamp units 100 is provided with an octal plug assembly 104 which is identical to the conventional octal plug used in vacuum tubes. Located interior to the red transparent plastic holder 102 is a neon lamp 106 which is of a conventional type and which preferably is of the type providing flickering illumination. The lamp is mounted in a socket assembly 108 and is electrically connected to the appropriate pins of the octal plug 104 by wires 110 and 112. Also located interior to the transparent candle holder 102 is a switch

ELECTRONIC VOTIVE LIGHTS

BACKGROUND OF THE INVENTION

The present invention relates to electronically timed and electrically operated votive lights and more specifically to an electronic circuit which permits individual lamp units to be illuminated for a predetermined period of time.

Candles have been used in religious ceremonies since long before the advent of Christianity. These candles have taken various forms and one popular form is the votive candle which is usually placed inside a red glass holder and is generally displayed in the sanctuary in rows on racks. Such votive candles are then individually lit in order to signify the offering of prayers or special intentions. These votive candles have been a very traditional manner of indicating such special intentions and typically the intention is accompanied by a donation or contribution and the candle then burns until it is exhausted. Such candles may be chosen to remain lit for various periods but the conventional or traditional periods are either four hours or seven days.

Although these candles are a tradition in many churches and denominations they provide serious fire hazards, since the candles remain lit overnight when the church is essentially unattended. Moreover the open flames of the candles will tend to provide smoke which not only adversely affects the air quality in the church but often times provides an unpleasant odor. Also because the candles are conventional paraffine or beeswax candles the burning wick will release considerable amounts of soot and lampblack into the air which tends to soil the walls and the interior of the church thereby increasing the normal cleaning and maintenance requirements. While these disadvantages may seem minimal it should be noted that very often hundreds of such candles are arrayed at the front of the church and the small contribution by each candle then becomes magnified accordingly.

Although the use of the votive candles involve all of the above mentioned drawbacks, it would never be seriously considered to eliminate the use of votive lights, since they form such an important part of many traditional church ceremonies.

SUMMARY OF THE INVENTION

The present invention provides an electronic circuit for causing electric lamps to be illuminated for predetermined periods of time. The electric lamps are intended to be placed inside replicas of the traditional candle holders so as to make it essentially impossible to distinguish between an actual burning candle and the lamp which is electrically illuminated. Each lamp is provided with an individual switch for activating that particular lamp. A specialized electronic timing circuit is provided in conjunction with each individual lamp such that the lamp will remain illuminated for a preselected period of time and upon the completion of such time period the lamp will be subsequently extinguished. The present invention is completely safe, since there are no fire hazards caused by flames or the like. The inventive electric lights are configured and arranged so as to be identical to the votive candle array which is presently in use.

The electronic timing circuit operates utilizing a single driver clock and each individual lamp assembly has associated with it a timing circuit which operates such

that once the switch is pressed the appropriate light will stay illuminated for a desired period of time.

Additionally the present invention provides an electronic timing circuit having a plurality of conventional octal sockets which mate with plugs located on the individual lamp units, such that the units may be changed at will to facilitate bulb replacement and also to convert one electronic timing unit which is arranged for use with a seven day lamp assembly to a four hour lamp assembly which utilizes the smaller type lamp units.

Accordingly it is an object of the present invention to provide a religious votive light which does not utilize candles.

It is another object of the present invention to provide an electronic timing circuit to accurately control the period of illumination of such votive lights.

It is a still further object of the present invention to provide an electronically timed electrically operated lamps for use as votive lights and which are each individually energizable and each individually timed so as to function as separate individual units.

It is another object of the present invention to provide an electronic timing circuit for use with electric votive lamps such that the timing circuit is extremely compact and employs solid state devices so as to require a minimum of power.

Finally it is an object of the present invention to provide an electronically timed electrically operable votive light array which is essentially undetectable from the conventional, traditional votive candle array.

The manner in which the present invention achieves these and other objects will become evident from the following detailed description of an embodiment of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an array of the inventive electrically operated votive lights.

FIG. 2 is a schematic in block diagram form of the circuit of the present invention.

FIG. 3 is a side elevation of one embodiment of an inventive votive lamp unit having a portion of the outer lamp holder cut away.

FIG. 4 is a circuit diagram of the switch and lamp wiring of the votive lamp of FIG. 3 in relation to the octal plug.

FIG. 5 is a side elevation of another embodiment of a votive lamp having a portion of the lamp holder cut away.

FIG. 6 is a circuit diagram of the wiring of the lamps and switch of the inventive lamp holder of FIG. 5 shown in relation to an octal plug; and

FIG. 7 is a circuit diagram of the electronic timing and energization unit of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows the inventive votive light array 10 and as may be seen such array appears identical to the traditional array utilizing votive candles in place of electric lamps. The noticeable differences between the inventive array 10 of FIG. 1 and the conventional or traditional candles might be that there is provided an electrical cord and plug 12 and also that each of the individual candle holders or lamp holders has protruding from the top a switch actuation button shown typically at 14

114 which is electrically connected to the appropriate pins of the octal plug 104 by means of wires 116 and 118. In order to permit ease of actuation of switch 114, an extender rod 120 is provided abutting the contact button 122 of switch 114. The extender rod 120 is slidably retained by a suitable retainer 124 which is affixed to the lamp socket assembly 108. Located at the opposite end of the extender rod 120 is a switch knob 126, which is preferably formed of black plastic so as to be as innocuous as possible.

FIG 4 shows the electrical connections in schematic form of the inventive votive lamp of FIG 3. The pins of the octal plug 104 are numbered consecutively from one to eight and the switch 114 is connected to pins 5 and 6 by wires 116 and 118, respectively. Similarly the neon lamp 106 is shown connected to pins 1 and 8 by conductors 110 and 112, respectively. The manner in which these pins of the plug assembly 104 mate with the electronic timing circuit will be shown in detail in FIG 7.

FIG 5 shows another embodiment of the inventive votive lamp assembly and, more particularly, shows a smaller type unit traditionally utilized for a four hour votive candle. The electric lamps are also mounted inside a traditionally shaped candle holder 142 which is formed of transparent red plastic so as to be identical to the traditional votive photo candle unit. The inventive votive lamp assembly 140 is intended to be plugged into the timing circuit by means of the octal plug 144, which is of conventional configuration. Located interior to the transparent red candle holder 142 are three miniature neon lamps 146, 148, and 150. Lamp 146 is connected to the appropriate pins of the octal plug 144 by wires 152 and 154. Similarly miniature neon lamp 148 is connected to the appropriate pins of the octal plug 144 by lines 156 and 158 and lamp 150 is connected to the appropriate pins by lines 160 and 162. Also utilized in conjunction with the four hour votive lamp assembly 140 is a switch means 164 which is of the momentary contact, push button type. The switch 164 is provided with a suitable actuation knob 166 which protrudes above the top surface of the red transparent candle holder 142 and is also preferably formed of black plastic so as to be relatively innocuous. The switch 164 is connected to the appropriate pins of the octal plug 144 by means of wires 168 and 170.

FIG 6 is a schematic circuit diagram showing the manner in which the switch 164 and lamps 146, 148 and 150 are connected to the pins of the octal plug 144. More particularly, switch 164 is connected across pins 5 and 6 of octal plug 144 by means of conductors 168 and 170, respectively. Neon lamps 146 is connected to pins 1 and 7 by conductors 152, 154, respectively; neon lamp 148 is connected to pin 1 and 2 of octal plug 144 by conductors 156, 158, respectively; and neon lamp 150 is connected to pins 1 and 4 by conductors 160 and 162, respectively.

By comparing FIGS 4 and 6 it is seen that the socket 22 to which the electronic timing circuit of the present invention is connected provides a universal type pin arrangement which will accept either the larger votive lamp of FIG 3 or the smaller four hour votive lamp of FIG 5. More particularly, it is seen that from FIGS 4 and 6 that the actuating switch is always connected across pins 5 and 6 and similarly that one side of all of the lamps is connected to pin 1 which is the energization pin. Each lamp is then connected to a different pin in the octal arrangement, and the lamp of FIG 4 is not

connected to any of the pins to which the three lamps of FIG 5 are connected.

Referring now to FIG 7 the elements shown in block form in FIG 2 are set forth in more detail. The 110 volt 60 cycle power is applied to the power supply unit 40 which comprises the on/off switch 42 and the pilot lamp 44 for indicating that the unit is operable. Additionally, a protective fuse 200 is provided. The earth ground appears on line 58 of the conventional three wire input line which is common to the majority of households. Additionally, prior to having the voltage stepped down by transformer 202, the AC input voltage is fed to the jack 46 on lines 50 and 52 as indicated in FIG 2. The 110 volt voltage is stepped down by transformer 202 and is then rectified by means of diodes 204 and 206, which are across the secondary of the transformer 202. The secondary of the transformer 202 has a center tap corresponding to line 56 of FIG 2 which is also fed to the jack 46. The diodes of the secondary side of the transformer 204 are tied together by means of diodes 204 and 206 on line 56. A smoothing capacitor 206 is connected across lines 54 and 56 thereby providing a low-ripple DC voltage of approximately 24 volts across lines 54 and 56.

The supply voltage regulator 60 which provides the accurately regulated five volts DC necessary to run the clock unit 64, is connected to lines 54 and 56 and comprises a commercially available voltage regulator integrated circuit 208. A unit suitable for use is manufactured by the National Semiconductor Corp. The 24 volts which appeared across lines 54 and 56 is lowered by a dropping resistor 210 which may comprise a 300 ohm 2 watt resistor. Also used with the integrated circuit voltage regulator 208 are two capacitors 212 and 214, the values of which are determined by the particular integrated circuit utilized. Line 56 is shown as being a ground; however, this ground symbol is intended to mean that the line 56 is an internal ground and is employed as a return line for the 24 volts DC. The earth ground is on line 58.

Accordingly, the five volt positive DC is fed on line 62 to the clock unit 64 which comprises two AND gates 216 and 218 which are connected through a feedback loop in the conventional manner to form an astable multivibrator. Provided in the feedback loop of the astable multivibrator made up of the AND gates 216 and 218 is a variable resistance potentiometer 220 which may be adjusted to achieve the desired frequency of oscillation. This potentiometer 220 is preferably a twenty turn potentiometer so that extremely accurate control over the oscillation frequency is possible. The output of the astable multivibrator on line 222 is fed to a first counter unit 224 which reduces the pulse rate of the astable multivibrator by counting to a certain count before it rolls over or produces an output. Such counters may be called a ripple-carry or a binary counter/divider and in the present case the counter 224 employed by the present invention is a 14-stage ripple-carry unit which counts to the binary number 2^{14} and then produces an output pulse. These counters are commercially available as an integrated circuit and manufactured by National Semiconductor Corp. and Texas Instrument Corporation. Accordingly, by adjusting frequency of oscillation and using counter 224, the output from counter 224 on line 66 can be made to be an extremely low frequency signal. Also provided is a test point 226 connected to line 222 to which may be connected a suitable frequency measuring instrument to accurately

determine the rate of oscillation of the astable multivibrators. More particularly by adjusting the wiper of potentiometer 220 the frequency at test points 226 should be adjusted to 221 925 Hertz, when it is desired to utilize the plug-in votive lamps corresponding to the seven day candles. Similarly when it is desired to utilize the smaller four hour lamps shown in FIG 5 the frequency of oscillation at test point 226 should be adjusted by means of the potentiometer 220 to a value of 9320 85 Hertz. Also connected to counter 224 is the highly regulated five volt DC voltage appearing on line 62 however in the interest of clarity it is only shown as a five volt bias voltage rather than connecting it to line 62. Accordingly as is seen from FIG 2, a low frequency clock pulse is made available to the counter units 68 on line 66 and hence this counting signal is available for use by the individual counters when such counters become activated by means of the relays and switches.

Turning now to the switch and relay portion of the inventive electronic votive lamp circuit of FIG 7 the input AC signal which was taken from the input line on lines 50 and 52, is fed through the jack 46 and plug 48 interface to one side of a first relay 230. Accordingly the contacts on that side of the relay 230 is the 110 volt AC which will be used to energize the proper lamp. This set of contacts of relay 230, as may be seen are normally open contacts. The other side of the contacts is connected by line 232 to octal socket 234 and, more specifically to pin number 1 of socket 234. Also provided is relay 230 is another set of normally open contacts, one side of which is connected to the DC voltage of 24 volts which is on line 54 from the power supply this voltage is also fed to pin 6 of the octal socket 234 on line 236. Relay 230 is then seen to be a conventional relay having two sets of normally-open contacts and having a conventional coil 238 which when energized will actuate both sets of normally-open contacts to a closed position.

Connected to one side of the coil by line 240 is a counter unit 242 which comprises an integrated circuit identical to counter 224. The pulsed input to the counter 242 from the clock circuit 64, is always present on line 66 and the counter is always energized by the five volt positive voltage on line 62 from the supply voltage regulator 60. Once the normally-open contacts of relay 230 which carry the 24 volts DC from line 54 are closed the counter 242 will be reset to zero and will begin to count the pulses on line 66 from an initial zero state. Counter 242 is reset to zero by a reset pulse generated by a resistor 243 and capacitor 244 combination which is energized by the 24 volts DC from the relay 230. Connected across the relay coil 238 is a suppression diode 245 which serves to reduce any transients or surges during energization and deenergization of the coil. Also connected to the top portion of coil 238 on line 240 is pin number 5 of the octal socket 234. The counter 242 then receives the pulsed signal on line 66 and because the counter 242 is a 14 stage ripple-carry binary counter it will count to 214 which corresponds to 16 384 and upon reaching such count will produce a high output pulse on line 246. This line 246 is fed to a non inverting driving amplifier 248 thereby causing such amplifier to produce a higher level output signal or raised voltage output signal on line 250. Also connected to the pins of the octal socket 234 is a first resistor 250 connected to pin 7 a second resistor 252 connected to pin 8 a third resistor 254 connected to pin 2 and a fourth

resistor 256 connected to pin 4. The other end of each of these resistors 250, 252, 254, 256 is connected to line 52 from the plug 48 which represents 110 volt AC signal. These resistors then act as dropping resistors for the neon lamps which are connected either in the seven day lamp of FIG 3 or the four hour lamp of FIG 5. More specifically resistors 250, 254 and 256 are utilized in the four hour lamp of FIG 5 and are all of an equal resistance of approximately 35 K ohms. The seven day lamp of FIG 3 utilizes one larger bulb and attendant lower resistance of 36 K ohms at resistor 252. It is, of course understood that octal socket 234 is intended to receive either octal plug 104 of FIG 3 or octal plug 144 of FIG 5. Assuming that a seven day votive lamp of FIG 3 is inserted into the octal socket 234, the circuit elements in the votive lamp are then connected as shown in FIG 4.

In operation the power supply 40 is connected to the proper 110 volt AC source and the on/off switch is closed thereby providing power to the unit. At the appropriate time, the switch 114 of FIG 3 is activated by pushing the button 126, thereby closing the normally-open contact switch 114 which as seen from FIG 4, is connected across pins 5 and 6 and attendant is now connected across pins 5 and 6 of octal socket 234. By doing this the 24 volts produced by the power supply is placed on line 240 which is connected to one side of the relay coil 238. The other side of the relay coil is connected by line 250 through the non inverting amplifier 248 to the internal ground or return line 56, thereby completing the circuit and placing essentially 24 volts across the relay coil 238. Since this is a momentary contact switch switch 114 immediately opens, however the voltage remains on the coil since the normally-open relay contacts were pulled in when the coil was energized and will stay pulled in thereby providing a self latching relay. At this time the 24 volts generates a reset pulse through the action of resistor 243 and capacitor 244 which is fed to counter 242 thereby permitting it to begin to count the clock pulses produced on line 66 from the initial zero stage. Similarly by energizing the relay coil 238 the set of contacts connected to the 110 volt AC line 50 is also pulled in, thereby placing the AC voltage on pin 1 of the octal circuit and attendant at pin 1 of the votive lamp of FIG 3. As shown in FIG 4, the neon lamp is connected from pins 1 and 8 and accordingly the AC voltage is impressed on the lamp and through resistor 252 to the return line 52. In this manner the lamp is illuminated. The relay 230 is now still latched since the path through ground is continued on line 250 through amplifier 248 and during this time, the counter 242 is counting the pulses supplied on line 66. At the time when the last stage of the counter counts the full 16 384 pulses the counter 242 will produce a high output signal on line 246 which is fed to the non inverting amplifier 248. The amplifier 248 then produces a raised output signal of approximately 24 volts thereby effectively causing the drop across the relay coil 238 to be zero, hence the relay drops out thereby opening the contacts of the 24 volt supply and also opening the other set of contacts which is serving to connect the AC line to the lamp. This extinguishes the lamp.

The present invention is intended to utilize a plurality of octal sockets and counters and relay units which may be connected as shown in FIG 7 i.e. these units are connected in parallel with each other. Each successive unit is identical to the stage described above and in the

interest of clarity the 24 volt line is shown at A as providing the desired voltage necessary to activate the counter. Additionally since the present invention is intended to provide additional stages which are in series with the overall initial stage shown in FIG 7 the clock signal on line 66 from the clock unit 64 is passed through an isolation buffer 82 which may comprise two integrated circuit gates or the like. This produces a clock signal on line 84 which has now been buffered for isolation purposes from the initial clock circuit. Also the system ground is passed to the next stage, as would the power lines corresponding to the 24 volts DC and the 110 volt AC. This may be accomplished by utilizing a properly wired plug and jacket combination to pass the AC and DC signal voltages to the next stage. It is understood of course, that only one clock unit is required for successive stages and only one voltage regulator and power supply is required.

As a further example of the manner in which the present invention provides either a seven day or four hour votive light, assume that the four hour votive lamp of FIG 5 has been inserted into the octal socket 234 of FIG 7. By reference to FIG 6 it is seen that the momentary contact switch is again across pins 5 and 6 and which can initiate operation as in the above example. In place of the single neon bulb which had been placed across cross-pins 1 and 8 three subminiature neon bulbs are now in the votive candle and are arranged from pin 1 which is energized with the AC signal to pins 2, 4 and 7. Each of these pins has connected between it and the AC return line 52 an identical resistor 250, 254, and 256. Utilization of four hour candles requires that the pulse rate of the signal on line 66 be adjusted and this is accomplished by placing a suitable frequency measuring instrument at test point 226 and adjusting the potentiometer 220 to produce pulsed output frequency of 9320.85 Hertz, thereby quickly accelerating the time in which the counter 242 will accumulate the 16,384 counts.

The above embodiment is given by way of example only and it is understood that the present invention is not intended to be limited thereby since other embodiments are possible. For example, different clock rates and counter capacities are possible and similarly different arrangements of neon lamps or incandescent lamps are available for use.

What is claimed is:

1. An electronically controlled electric lamp assembly comprising:
 - a plurality of relay means each having energizable coil portions for actuating control contact portions and power contact portions and each relay means being connected to the power source;
 - a plurality of switch means corresponding to said plurality of relay means, one being electrically connected between one of said plurality of relay means and said electric power source for actuatingly energizing said relay coil portions thereby actuating said control contact portions for causing said coil portions to remain energized;
 - a plurality of electric lamps connected to corresponding power contact portions of said plurality of relay means whereby upon said energization of said coil portions said power contact portions are actuated and corresponding lamps are energized; and
 - timing means electrically connected to said switch means and said coil portions of said relay means

whereby upon actuation of said switch said timing means is activated for a predetermined period of time and upon the expiration of said predetermined period of time, said timing means lowers the current flow through said energized coil portions, thereby lowering the voltage drop across said energized coil portions and opening said control contact portions for deenergizing said coil portions and opening said power contact portions of said relay means for deenergizing a corresponding electric lamp.

2. The apparatus of claim 1 wherein said timing means comprises a clock means connected to said power source for producing a pulsed signal and a plurality of counters corresponding to said plurality of relay means connected to receive said pulsed signal for counting a predetermined number of pulses therein and producing an output signal indicating the expiration of said predetermined period of time.

3. The apparatus of claim 2 wherein said timing means further comprises a plurality of amplifier means connected to receive said counting means output signal and each producing therefrom an amplified signal connected to said coil portions of said plurality of relay means thereby reducing the voltage drop thereacross and lowering the current flow therethrough and causing said control contact portions and said power contact portions to open.

4. The apparatus of claim 3 further comprising a plurality of light transmitting housings each having mounted therein one of said switch means and corresponding one of said electric lamps.

5. The apparatus of claim 4 further comprising a plurality of plug means each affixed to one of said light transmitting housings and electrically connected to said switch means and said lamp means for cooperating with a corresponding one of a plurality of socket means, said socket means being electrically connected to said power source and said relay means said coil portion.

6. An electrical light array comprising:

- a plurality of electrical lamps;
- a plurality of switch means, one being associated with a corresponding one of said electrical lamps;
- a plurality of relay means, one being associated with a corresponding one of said switch means and being energizable thereby and each of said relay means being electrically connected to a corresponding one of said electrical lamps;

power source means connected to said relay for supplying power to said plurality of electrical lamps, and

timing means connected to said plurality of relay means and energizable for a predetermined period of time, whereby upon actuation of one of said plurality switch means one of said plurality of relay means closes and energizes one of said plurality of lamps and energizes said timing means for maintaining said lamp in an on condition for said predetermined period of time wherein said timing means comprises a clock means connected to said power source for producing a pulsed output signal, a plurality of counters corresponding to said plurality of relay means, each being connected to receive said pulsed output signal for producing a counter output signal upon the counting of a predetermined number of pulses, and a corresponding plurality of amplifier means each having an input connected to said counting signal and an output connected to a

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corresponding one of said relay means such that upon one of said plurality of counters producing said counter output signal a corresponding one of said plurality of amplifiers produces an amplified output signal for deenergizing a corresponding one of said relay means.

7 The apparatus of claim 7 wherein a one of said switch means and a corresponding one of said electrical lamps are located within a substantially transparent housing, a plug means mounted in said transparent housing and having pins electrically connected to said switch and said lamp and a socket means electrically connected to said relay means and said power source means for mating with said plug means.

8 An electronically controlled electrical votive lamp assembly for use with a voltage source, comprising a plurality of electrical lamps,

a plurality of relay means each of said relay means having a coil portion, a power contact portion and a control contact portion and each being connected to said voltage source and to a corresponding one of said plurality of electrical lamps for connecting

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said electrical lamps through said power contact portions to said voltage source.

a plurality of switch means connected to corresponding ones of said relay means and connected to said voltage source for selectively energizing a corresponding one of said coil portions of said relay means thereby closing said control contact portions for causing said coil portions to remain energized and closing said power contact portions whereby an associated one of said lamps is energized and

timing means, connected to said switch means and said relay means for deenergizing said coil portions of said relays upon the elapsing of a predetermined period of time thereby opening said control contacts and disconnecting said coil portions from said voltage source and opening said power contacts and deenergizing said lamps.

9 The votive lamp assembly of claim 8 further comprising a plurality of transparent red plastic housings having one of said plurality of switch means and, one of said plurality of electrical lamp means mounted therein.

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recherche préliminaire Ce dernier n a pas été
établi à la date de publication de la demande

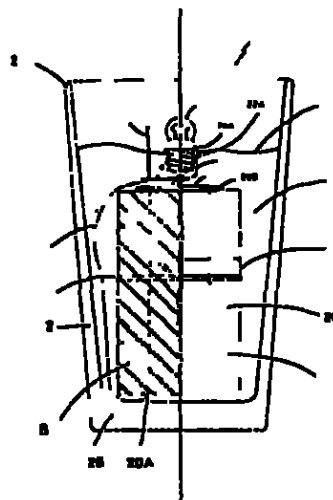
60 Références à d autre documents nationaux
apparentes

73 Titulaire(s)

74 Mandataire AZ DIFFUSION SARL

54 LAMPE DECORATIVE

57 Cette lampe comprend un corps translucide (12) for
mant récipient ouvert à une extrémité (12A) une masse
(14) de remplissage du corps (12) présentant une surface
libre (14A) au droit de l'extrémité ouverte (12A) du corps
une ampoule électrique (16) saillante au dessus de la sur
face libre de la masse de remplissage (14) et des moyens
(18) d'alimentation électrique de l'ampoule (16) noyés dans
la masse de remplissage (14)



FR 2 757 927 - A1



La présente invention concerne une lampe décorative

Il est connu d'utiliser pour la décoration notamment d'une table de repas un dispositif d'éclairage
5 comprenant un verre translucide formant récipient contenant une bougie. Un tel dispositif est habituellement appelé verrine.

Or il existe de nombreux sites par exemple les musées dans lesquels une réglementation interdit
10 l'utilisation de dispositifs à flamme dans un souci de sécurité anti-incendie. De ce fait les verrines classiques ne peuvent pas être utilisées pour la décoration de tels sites.

L'invention a pour but de proposer un dispositif
15 d'éclairage disposant des mêmes atouts décoratifs qu'une verrine mais ne présentant pas de flamme.

A cet effet l'invention a pour objet une lampe décorative caractérisée en ce qu'elle comprend

- un corps translucide formant récipient ouvert
20 à une extrémité

- une masse de remplissage du corps présentant une surface libre au droit de l'extrémité ouverte du corps

- une ampoule électrique saillante au-dessus de
25 la surface libre de la masse de remplissage et

- des moyens d'alimentation électrique de l'ampoule noyées dans la masse de remplissage

L'invention sera mieux comprise à la lecture de la description qui va suivre donnée uniquement à titre
30 d'exemple et faite en se référant aux dessins dans lesquels

- la figure 1 est une vue schématique en coupe longitudinale d'une lampe selon l'invention

- la figure 2 est une vue schématique en coupe
35 transversale de la lampe représentée à la figure 1

- la figure 3 est une vue schematique d un circuit électrique d alimentation d une ampoule de la lampe

On a représenté sur les figures 1 et 2 une lampe decorative selon l invention designée par la reference
5 générale 10

La lampe 10 comporte un corps translucide 12 formant un recipient ouvert a une extrémité 12A

Le corps 12 de preference en verre a une forme
10 générale evasee s élargissant a partir d un fond 12B de ce corps De preference l extrémite ouverte 12A a un diametre de 5 cm environ le fond 12B a un diametre de 4 cm environ et le corps 12 a une hauteur de 8 cm environ

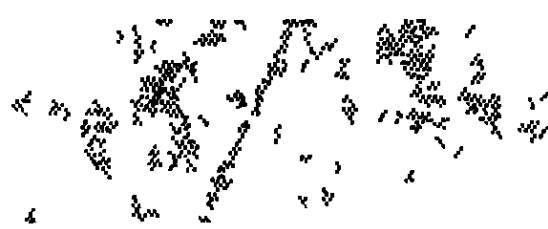
La lampe 10 comporte de plus une masse 14 de
15 remplissage du corps 12 par exemple coulée dans ce corps 12 avant durcissement présentant une surface libre 14A au droit de l extrémite ouverte 12A du corps La surface libre 14A est de préférence en retrait à l interieur du corps 12 par rapport au bord de l extrémite ouverte 12A
20 de ce corps

La masse de remplissage 14 est constituée par un materiau habituellement utilisé pour la fabrication des bougies notamment de la cire de la paraffine ou de la stearine La masse de remplissage 14 est visible a
25 travers le corps 12 translucide La couleur de cette masse 14 est par exemple blanche

La lampe 10 comporte également une ampoule electrique 16 et des moyens 18 d alimentation electrique de cette ampoule 16 noyés dans la masse de remplissage
30 14

L ampoule 16 fait saillie au-dessus de la surface libre 14A de la masse de remplissage

Les moyens d alimentation électriques 18 comprennent un ensemble 20 accumulateur d energie rechargeable à courant continu relié électriquement à
35 une douille 22 de support de l ampoule 16



La douille 22 affleure ou dépasse légèrement la surface libre 14A de la masse de remplissage. Une douille pour culot de type E5 5 convient bien à l'invention.

La douille 22 est munie de deux branches formant
5 deux bornes 24 26 de raccordement électrique.

L'ensemble accumulateur 20 est muni de deux pôles négatif 20A et positif 20B reliés électriquement aux deux bornes 24 26 de la douille 22 à l'aide de moyens classiques. A titre d'exemple, le pôle négatif 20A
10 de l'ensemble accumulateur 20 est relié par un conducteur électrique 28 à une première borne 24 de la douille et le pôle positif 20B de l'ensemble accumulateur 20 est relié directement à la seconde borne 26 de la douille par soudage.

De préférence, la tension aux bornes de
15 l'ensemble accumulateur 20 est d'environ 3,6 V et l'intensité circulant dans l'ampoule 16 est d'environ 200 mA.

L'ensemble accumulateur 20 est relié
20 électriquement à deux bornes de recharge de polarités opposées saillantes à travers la surface libre de la masse de remplissage 14. Ces bornes de recharge sont constituées de préférence l'une par une patte 30 conductrice reliée électriquement à la première borne 24
25 de la douille 22 et l'autre par une partie 16A du culot de l'ampoule (ou une partie 22A de la douille en contact électrique avec cette partie 16A du culot) reliée électriquement à la seconde borne 26 de la douille.

La patte 30 est constituée par exemple par un fil
30 métallique.

Les bornes de recharge accessibles à l'extérieur de la masse de remplissage 14 sont destinées à être raccordées à un chargeur classique après utilisation de la lampe 10.

A titre d'exemple, l'ensemble accumulateur 20
35 comporte trois accumulateurs en forme de batonnets B1 à

B3 raccordés électriquement en série comme cela est représenté sur la figure 3

Les trois accumulateurs B1 à B3 sont disposés l'un contre l'autre parallèlement entre eux et sont
5 relies mécaniquement par un moyen classique par exemple un lien 32 comme cela est représenté sur les figures 1 et 2 ou une enveloppe constituée par exemple par un film plastique notamment thermorétractable

De préférence l'ampoule 16 coopère avec la
10 douille 22 par vissage l'allumage et l'extinction de cette ampoule 16 se faisant par vissage et dévissage de cette dernière

L'invention permet d'obtenir une lampe électrique autonome quant à son alimentation en énergie ayant un
15 aspect décoratif chaleureux très similaire à celui d'une verrine à flamme

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REVENDICATIONS

1 Lampe décorative caractérisée en ce qu'elle comprend

- un corps translucide (12) formant récipient
- 5 ouvert à une extrémité (12A)
- une masse (14) de remplissage du corps (12) présentant une surface libre (14A) au droit de l'extrémité ouverte (12A) du corps
- une ampoule électrique (16) saillante au-dessus
- 10 de la surface libre de la masse de remplissage (14) et
- des moyens (18) d'alimentation électrique de l'ampoule (16) noyées dans la masse de remplissage (14)

2 Lampe selon la revendication 1 caractérisée en ce que la surface libre (14A) de la masse (14) est en

15 retraits à l'intérieur du corps (12) par rapport aux bords de l'extrémité ouverte (12A) de ce corps

3 Lampe selon la revendication 1 ou 2 caractérisée en ce que la masse de remplissage (14) est constituée par un matériau notamment de couleur blanche

20 habituellement utilisé pour la fabrication des bougies choisies notamment parmi la cire, la paraffine et la stéarine

4 Lampe selon l'une quelconque des revendications précédentes caractérisée en ce que les

25 moyens (18) d'alimentation électrique comprennent un ensemble (20) accumulateur d'énergie rechargeable à courant continu muni de deux pôles négatif (20A) et positif (20B) reliés électriquement à deux bornes (24, 26) d'une douille (22) de support de l'ampoule (16)

5 Lampe selon la revendication 4 caractérisée en ce que l'ensemble accumulateur (20) est relié électriquement à deux bornes de recharge de polarités opposées saillantes à travers la surface libre (14A) de la masse de remplissage constituées l'une par une patte

35 conductrice (30) reliée électriquement à une borne (24) de la douille et l'autre par une partie (16A) d'un culot

de l'ampoule ou une partie (22A) de la douille (22) en contact électrique avec cette partie (16A) du culot reliée électriquement à l'autre borne (26) de la douille

6 Lampe selon la revendication 4 ou 5
5 caractérisée en ce que l'ensemble accumulateur (20) comprend trois accumulateurs (B1 à B3) en forme générale de batonnets raccordés électriquement en série ces batonnets étant disposés l'un contre l'autre
10 parallèlement entre eux et reliés mécaniquement par des moyens (32)

7 Lampe selon l'une quelconque des revendications 4 à 6 caractérisée en ce que la tension aux bornes de l'ensemble accumulateur (20) est d'environ 3,6 V et l'intensité circulant dans l'ampoule (16) est
15 d'environ 200 mA

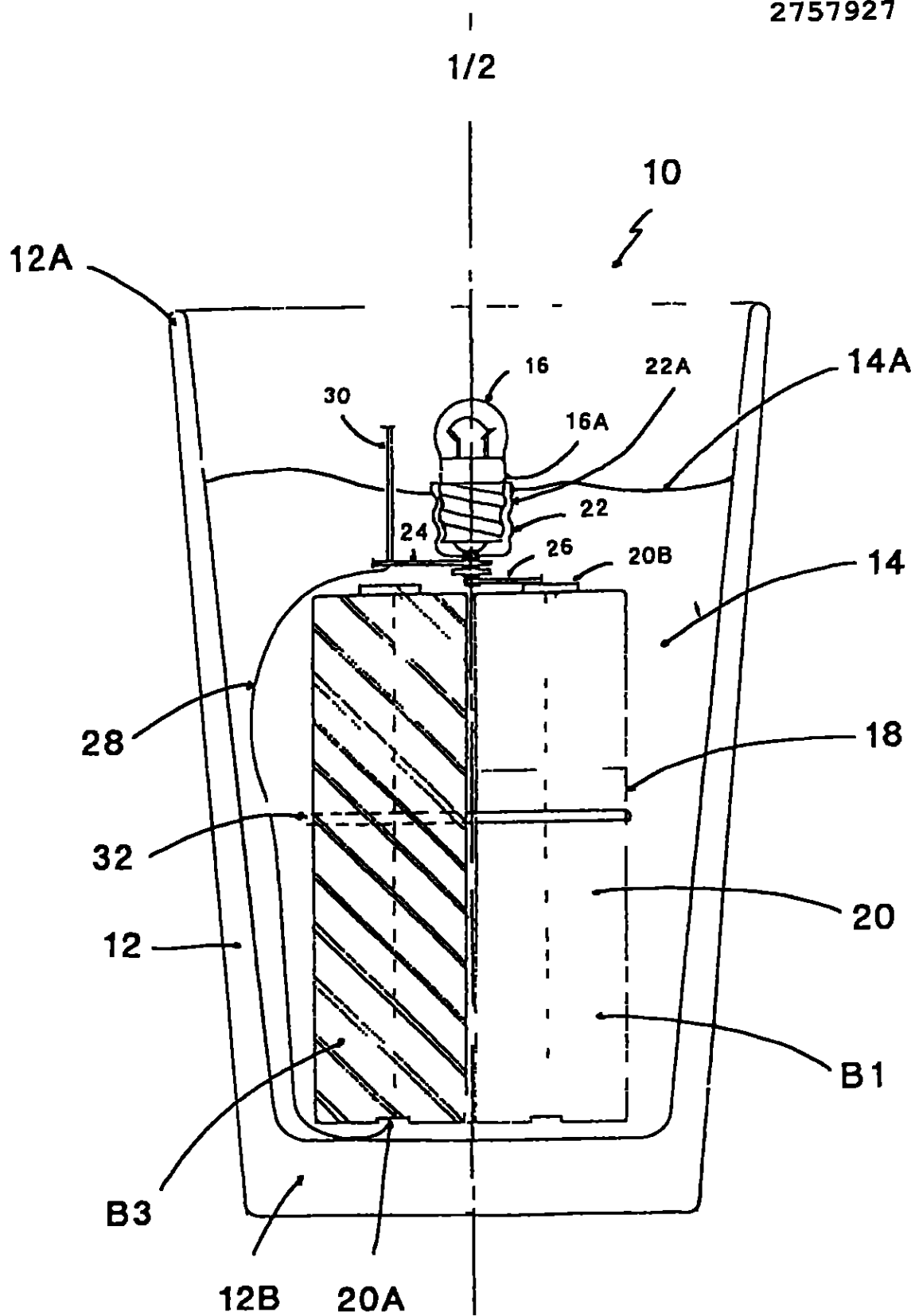
8 Lampe selon l'une quelconque des revendications 4 à 7 caractérisée en ce que la lampe (16) coopère par vissage avec la douille (22) l'allumage et l'extinction de cette lampe (16) se faisant par
20 vissage et dévissage de cette dernière

9 Lampe selon l'une quelconque des revendications précédentes caractérisée en ce que le corps (12) est en verre

10 Lampe selon l'une quelconque des revendications précédentes caractérisée en ce que le corps (12) a une forme générale évasée et comporte un fond (12B) ayant un diamètre de 4 cm environ l'extrémité ouverte (12A) du corps (12) ayant un diamètre de 5 cm environ et la hauteur du corps (12) étant de 8 cm
25 environ
30 environ

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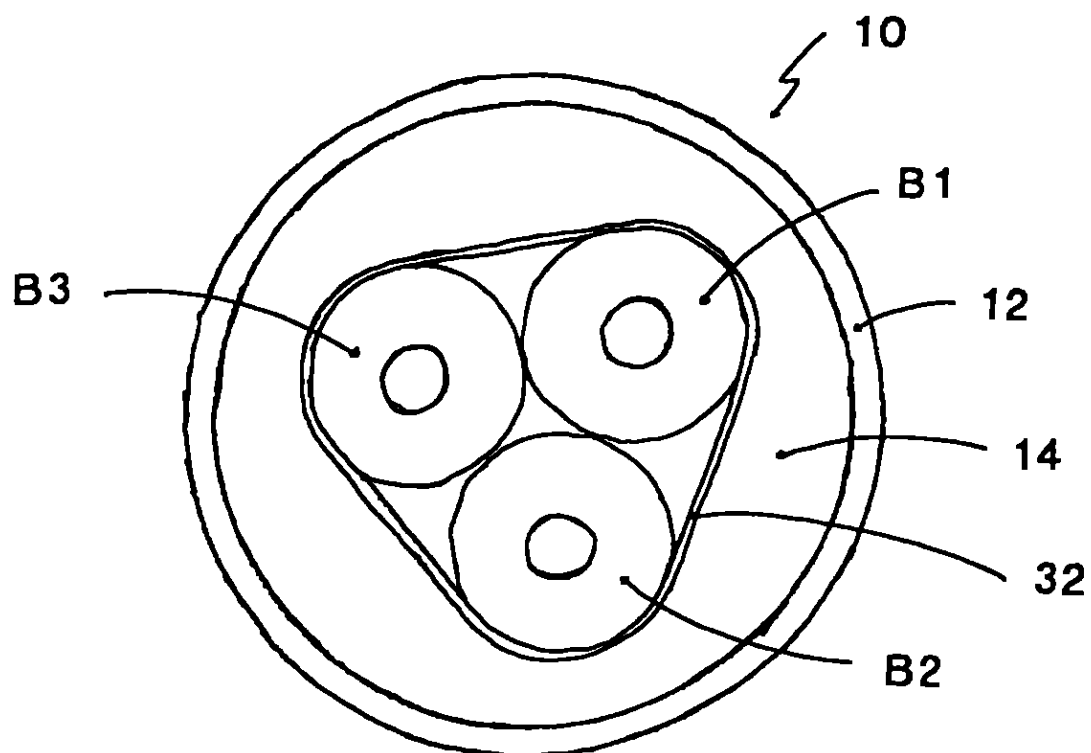


FIG 2

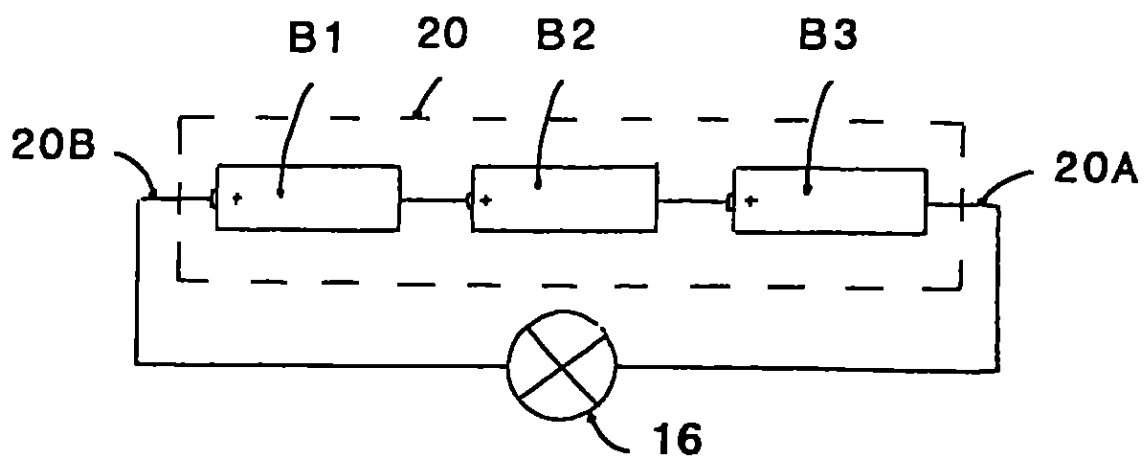


FIG 3

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CONTROLLING SWITCH WITH MISJ FOR LUMINARIES

Filed May 2 1958

3 Sheets-Sheet 1

FIG. 1

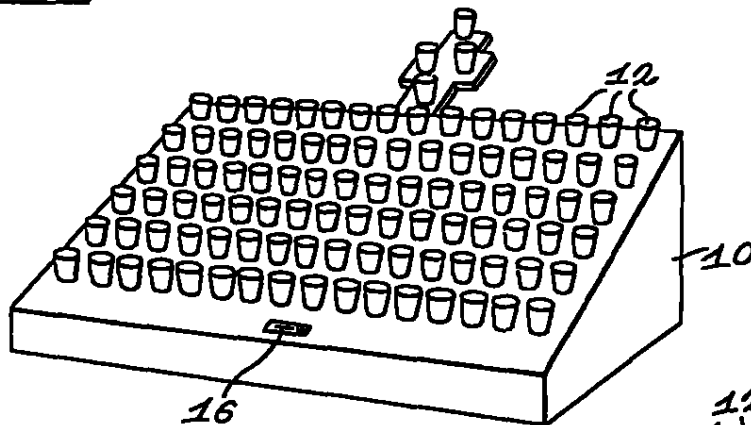


FIG. 2

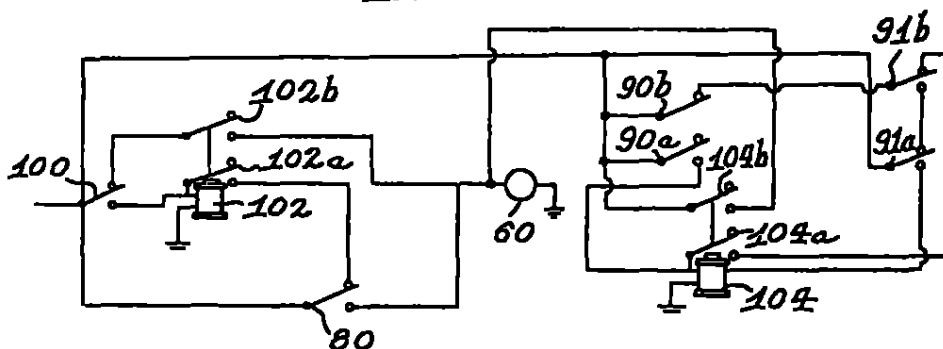
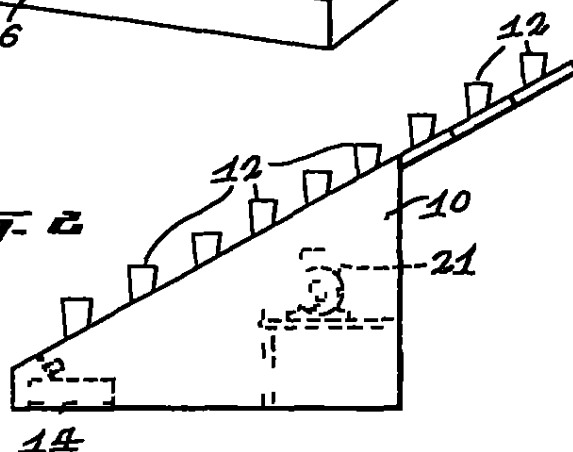


FIG. 10

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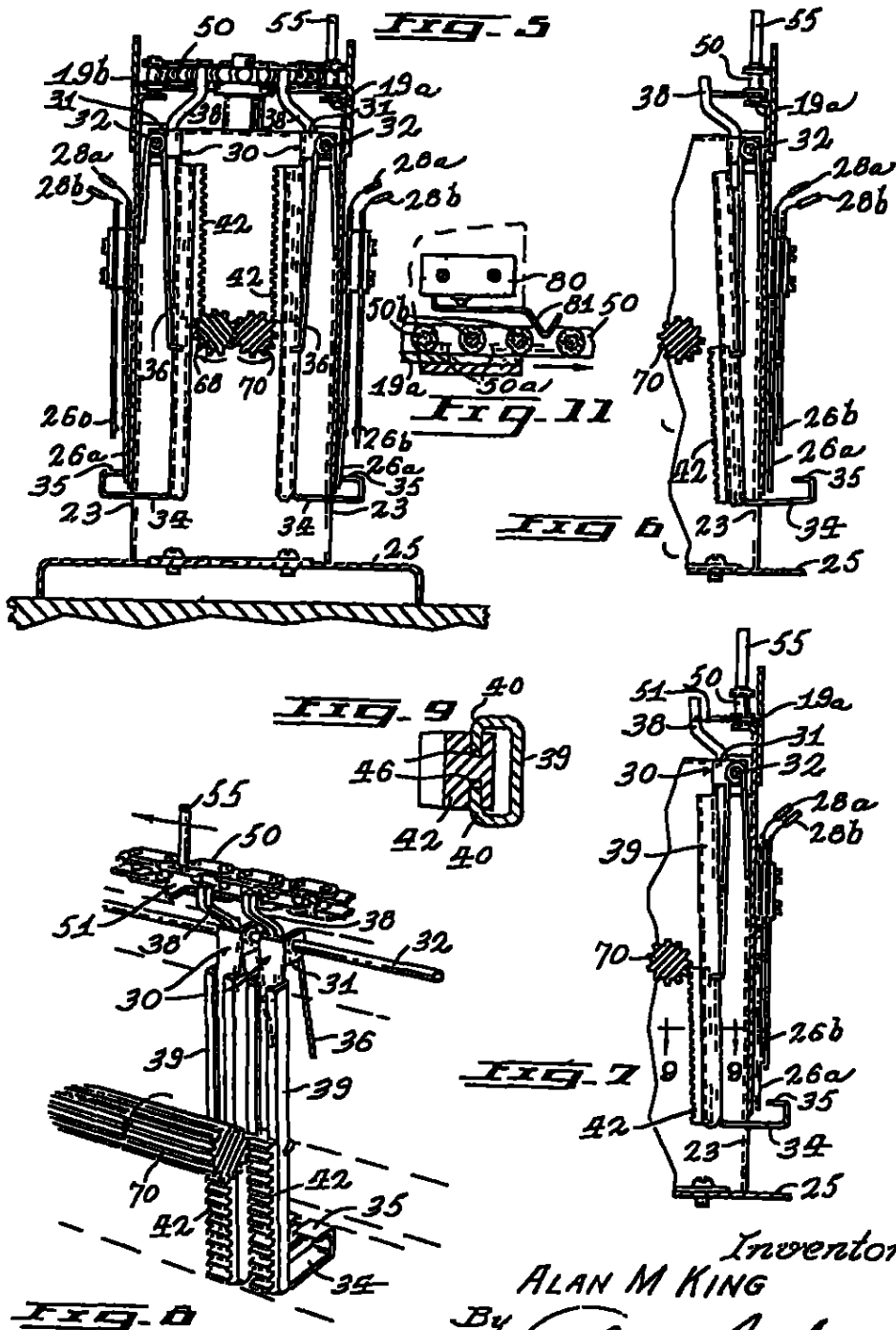
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CONTROLLING SWITCH MECHANISM FOR LUMINARIES

Filed May 2 1958

3 Sheets-Sheet 3



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United States Patent Office

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CONTROLLING SWITCH MECHANISM FOR LUMINARIES

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Application May 2, 1958 Serl l No. 732 612

14 Claims. (Cl 200—33)

The present invention is concerned with cam controlled time switch mechanisms adapted to selectively energize and maintain for a predetermined length of time, individual electrical circuits from a plurality of such circuits.

More specifically the invention is a coin controlled time switch mechanism particularly suited for use in combination with religious luminaries consisting of multiple arrangements or banks of electric lamps arranged to simulate rows of candles.

For this purpose the lamps must be arranged and controlled so that by depositing an appropriate coin or coins one or more lamps are operated for a selected time period. As will be appreciated the individual lamps must be initially energized in succession and automatically reset for subsequent energization at the end of the time period.

At the present time there are switch mechanisms available for this purpose, but these in order to handle the number of circuits required are cumbersome and bulky requiring considerable space for their installation.

In accordance with the present invention a compact mechanism is provided to give the time sequence controlling action required. Essentially the present apparatus consists of at least one and preferably two opposed rows of spaced apart switches each switch controlling a single lamp a common switch actuating means adapted to energize said switches individually and in sequence, and a common switch resetting means adapted to act on the energized switches and with the desired time lag return the switches in sequence according to their initial energization to normal position ready for a further tripping or energization under the control of a coin operated controlling mechanism.

More specifically each switch of the row or opposed rows of switches includes opposed spaced apart resilient contact leaves or plates and a pivotally mounted rack holder or contact arm which is adapted to open or close the switch contact plates. Each rack holder includes an extension or contact member extending above the common row of switches and is constructed so as to slidably retain a toothed rack segment on its inner surface opposed to the switch contact plates.

The common switch actuating means consists of an endless chain mounted for travel along the tops of the switch contact arms and this chain is provided with a projecting trip member adapted to contact in sequence the projecting contact members of the rack holders as it passes. Chain driving means and circuit means are combined with the controlling coin deposit mechanism so that on deposit of an appropriate coin the chain is moved a predetermined distance sufficient for the chain trip member to contact and pivot inwards one rack holder.

The common switch resetting means in the preferred construction consists of a pair of constantly and slowly driven opposed splined shafts which are mounted so as to extend between the opposed rows of rack holders. The rack holders are disposed relative to the driven shafts so that the pivoting inwards of any one holder permits the

rack portion slidably mounted therein to drop obliquely downwards past the respective shaft. Release of the rack holder which is resiliently biased causes the top toothed portion of the rack portion to engage with the correspondingly opposed toothed portion of the adjacent splined shaft. Accordingly under the constant rotation of the shafts the rack portions are slowly raised until they engage the shaft allowing the pivotally mounted rack holders to pivot outwards to their original position opening the respective switch contact plates and breaking the individual circuits. As previously mentioned in order to ensure the return of the rack holders to normal reset condition each pivotally mounted arm is resiliently biased outwards or towards the driven splined shafts.

Having thus generally described the nature of the invention particular reference will be made to the accompanying drawings showing by way of illustration a preferred embodiment thereof and in which:

Figure 1 is a view in perspective elevation of a stand supporting a bank or rows of electrical votive lights controlled in accordance with the invention.

Figure 2 is a side view of the controlling mechanism with the coin deposit mechanism indicated in broken lines to illustrate the relative position in the interior of the stand.

Figure 3 is a view in side elevation of the controlling mechanism of the invention showing the two end portions the central portion omitted being identical.

Figure 4 is a plan view of the construction shown in Figure 3.

Figure 5 is a sectional view of the construction shown in Figure 4 to illustrate more clearly a typical arrangement of a pair of opposed contact switch assemblies the endless actuating chain and constantly rotating driven shaft return splined shafts with the switch contact arms shown in normal non-actuated position.

Figure 6 is a detail view of the right-hand switch assembly of Figure 5 to show the rack holders tripped or actuated position under the engagement of the chain contact member with the projecting contact member or pin of the holder the resilient switch contact plates being released into contact making circuit to one of the lamps.

Figure 7 is a detail view corresponding to Figure 6 with the rack supporting arm freed by the chain contact member and pivoted outwards by the biasing spring bringing the upper toothed portion of the sliding rack into meshed engagement with the teeth of the opposed rotating splined shaft.

Figure 8 is a somewhat diagrammatic view in perspective elevation to illustrate a portion of the actuating chain and contact member with a pair of adjacent rack holders actuated in sequence showing the rack portion of the nearest holder partially raised by its engagement with the rotating splined shaft, the switch contact blades being omitted for clarity.

Figure 9 is a cross-sectional view of the rack holder of Figure 7 along the line 9—9 to illustrate more clearly the rotating of the sliding rack portion.

Figure 10 is a diagrammatic view of a suitable circuit for the apparatus of the invention.

Figure 11 is an enlarged detail view of a portion of the switch actuating chain and chain actuated control switch to illustrate the preferred single link controlling arrangement in more detail.

With particular reference to Figures 1 and 2 of the drawings a religious luminary 10 having a plurality of votive lights 12 is shown in front and side elevation. The lights 12 are arranged to simulate the appearance of candles and each light is provided with an electric lamp adapted to be energized and controlled in

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sequence by the apparatus of the invention. A coin receiving container 14 is mounted beneath the stand as shown in broken lines with a coin receiving slot or slots 16 provided on the exterior. The coin receiving container 14 is connected by a suitable circuit as will be described to the controlling apparatus of the invention also shown in broken lines, and indicated generally at 21.

As shown see Figures 3 and 4 a preferred construction of the main controlling apparatus in accordance with the invention includes two opposed rows of switch assemblies there being one switch assembly 20 for each of the lights 12. While the end portions only are shown in Figures 3 and 4 it will be appreciated that the complete assembly is of sufficient length to provide any required number of switches for example, to control the arrangement illustrated would require about 50 switches in each row since there are about 100 votive lights 12 shown.

The switch assemblies 20 are mounted in two opposed aligned rows on correspondingly aligned supporting plates 22 supported at each end by standards 24a 24b. The standards 24a 24b are mounted on a base plate 2 together with the driving mechanism for the apparatus as will be described in more detail later.

Each switch assembly 20 as shown most clearly in Figures 5 6 7 includes a pair of opposed resilient contact blades 26a 26b which are mounted to the plate 22 with the longer blade 26a adjacent the plate and to which suitable connections 28a 28b are made from the lamp energizing circuit. Rack holders 30 are each pivotally mounted at one end by lugs 31 to a common shaft 32 extending the length of the respective plate 22 so as to be aligned with one pair or set of switch blades 26a 26b. A lateral extension 34 of each rack holder 30 fits through the gap or opening 23 provided along the length of the switch assemblies between the base plate 25 and the plate 22. Each extension 34 is shaped so as to have an end flange 35 adapted to engage the blade 26a of the switch contact blades when the switch arm 30 is in its normally closed position. Since the rack holder 30 is normally resiliently biased away from the inner surface of the plate 22 by a spring 36 also mounted on the shaft 32 the extension 34 holds the blade 26a against the respective outer surface of the plate 22 keeping the circuit open. Each rack holder 30 is provided with an outstanding contact member or pin 38 which is secured to the upper end of the holder 30 so as to extend above the common axis shaft 32. The main body of the rack holder 30 is formed as a channel section 39 having opposed flanges 40 and a toothed rack portion 42 is slidably mounted therein by the engagement of the flanges 40 with slots 46 provided at each side of the rack portion 42.

A main feature of the present invention resides in the mounting of the rack holders 30 and the means whereby they are initially tripped to energize the individual lamp circuits and in sequence returned to their original positions with the desired time lag interval.

An endless switch actuating chain 50 is mounted between chain sprockets 52, 54 for travel above and along the length of the opposed rows of switch assemblies 20. The supporting plates 22 are provided with inwardly extending flange portions 19 19b which form chain guiding tracks along the length of the apparatus. In the construction illustrated the chain sprocket 52 is mounted as an idler on a stub shaft 53 journaled on the upper end of the standard 24a while the chain sprocket 54 is fixedly mounted on the upper end of the drive shaft 55 extending through and being journaled in the supporting standard 24b. A chain drive motor 60 is mounted on the base plate 25 and is provided with bracket extensions 61 62 which also act to support and align the drive shaft 55. The drive from the motor 60 is transmitted to the drive shaft 55 by opposed bevel gears 63 64. As will be explained in more detail later circuit

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means connected to the coin receiving container 14 are adapted to control the actuation of the chain 50 and switch means connected with the chain and circuit are adapted to limit the travel of the chain on each coin controlled actuation.

A pair of opposed counter-rotating splined shafts 68 70 are journaled between the supporting standards 24a 24b so as to extend the length of and between the opposed switch assemblies 20. A shaft driving motor 72 is mounted on the base plate 25 and supplies a constant drive to speed reduction boxes 74a 74b coupled through gears 75 76. The drive from the speed reduction box 74b in turn is transmitted to the splined shaft 68 which as it is in meshed engagement with the shaft 70 also causes a corresponding counter rotation of this latter shaft. The gear reduction of the boxes 74a 74b is preferably very great so that the splined shafts 68 70 complete one revolution about every 5 hours to give the desired time lag effect.

With this arrangement, and with particular reference to Figures 5 through 8 the individual switch assemblies 20 are tripped and reset in the following manner. It should first be mentioned that the switch actuating chain 50 is provided with an outstanding switch contact member or cam plate 51 which extends inwardly of the chain so as to intersect the aligned switch members 38. An outstanding trip pin 55 is also provided on the chain 50 at this point and acts in combination with controlling switch arrangements to transfer the cam plate 51 from one row to the other as will be described later.

Referring to Figure 5 we shall assume that the chain 50 has proceeded to a point where the cam plate 51 is directly in front of the pin 38 of the rack holder 30 of the right hand switch assembly shown. On deposit of an appropriate coin the chain 50 is driven so that the plate 51 now contacts the pin 38 tilting the rack holder 30 about the shaft 32 as shown in Figure 6. The effect of this inward tilting of the holder 30 is that the rack portion 42 since it is now cleared from its idling position above the shaft 70 slides downwards by force of gravity to the bottom of the rack holder 30 and the end flange 35 of the extension 34 moves outwardly and releases the switch blade 26a. The release of the switch blade 26a permits it to contact the opposing blade 26b completing the circuit to the particular lamp connected thereto. As the chain cam plate 51 continues past the contact pin 38 the pin 38 is released and through the spring 36 the rack holder 30 is again tilted outwards towards the shaft 70. However the upper tooth of the rack portion 42 is now placed in meshed engagement with the teeth of the rotating shaft 70 and therefore the rack holder 30 cannot return fully to its original position but remains in a slightly inwardly tilted position maintaining the flange 35 of the extension 34 clear of the switch contact blade 26a. Accordingly the switch will remain in closed and energized condition until the rack portion 42 through the rotation of the shaft 70 has again moved up to its upper idling position clear of the shaft 70 releasing the rack holder 30 to the influence of the spring 36 which will return it to its original position. The final inward movement of the rack holder extension 34 again brings the flange 35 into depressing contact with the switch blade 26a breaking the contact and turning off the lamp.

In order to control the actuation of the chain drive motor 60 and consequently the travel of the chain cam plate 51 so that a single switch assembly is actuated on each coin deposit, a chain control switch 80 is mounted on a bracket 100 secured at each side to the opposing plates 22 adjacent the standard 24b so that an actuating switch arm 81 is disposed in the path of the links 50a of the chain 50 see Figure 11. In the preferred construction illustrated the spacings between the switch assemblies contact pins 38 are maintained to agree with the spacings between the connecting rivets 50b of the

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chain 50 i.e. on the order of $\frac{3}{4}$ so that as each link 50a passes the control switch 80 the switch arm 81 is first contacted by a rivet 50b and then falls into the depression between this and the following rivet. The chain cam plate 51 is contoured and located on the chain 50 so that the individual contact pins 38 are forced outwards and released when the plate 51 has travelled the length of one link 50a. Accordingly the chain switch 80 since it is controlled by the spacing of the links 50a breaks the contact to the chain drive motor 60 at each link spacing so that the chain 50 is stopped before the cam plate 51 contacts the next contact pin 38.

The chain trip pin 55 also acts in combination with control switches 90a 90b mounted on the bracket 100 and also similar control switches 91a 91b mounted on a corresponding bracket 102 disposed adjacent the stand and 2-a in the path of the chain 50 at each end of the rows of switches to accelerate the travel of the chain cam plate 51 from row to row. The switches 90a 90b 91a and 91b are each provided with resilient contact arms as shown for the switch 80. As shown in Figures 4 and 11 the switches 90a 90b 91a 91b are mounted so that their contact arms are disposed in the path of the chain trip pin 55 so that, for example, the switch 90a is contacted and actuated immediately the chain cam plate 51 has released the last switch contact pin 38 in the right hand row of switches. The actuation of the switch 90a starts the chain drive motor 60 which remains actuated until the trip pin 55 contacts the contact arm of the switch 90b which when actuated stops the chain drive motor 60. The switches 91a 91b function in a like manner when the chain trip pin 55 reaches the opposite end of the row of switches. As will be described the single link controlled chain switch 80 is rendered inactive during the travel of the chain between the switches 90a and 90b or 91a 91b and is restored immediately the switches 90b or 91b are actuated.

To describe the action of these controlling switches and other controlling circuits particular reference will be made to Figure 10 illustrating a preferred overall circuit diagrammatically. In this circuit a coin switch 100 is closed by the deposit of a coin in the coin container 14. The internal arrangement and workings of coin deposit containers of this nature are well known and varied and therefore it is not thought necessary to describe or illustrate this in detail.

The closing of the coin switch 100 energizes the coin relay coil 103 closing the relay so that it remains energized the power travelling through the relay contacts 102a, to the chain control switch 80. After the coin has passed the coin switch 100 returns to normal position so that power travels through the coin switch 100 and the second set 102b of the relay contacts to the chain drive motor 60 starting it. As the chain drive motor 60 moves the chain 50 as previously described the contact arm 81 of the switch 80 drops into space between links 50a allowing the switch 80 to return to normal position. This breaks the circuit to the coin relay 102 de-energizing it, returning relay contacts 102 102b to full open operation. The chain drive motor 60 continues to run getting its power through the chain switch 80 until the switch contact arm 81 is contacted by the next link pin 50b again actuating the switch and stopping the motor 60.

As also previously described when the chain cam plate 51 has actuated the last switch contact pin 38 on the end of a row of switches it is necessary that it be moved around the supporting sprocket gear to a starting position on the opposite row of switches.

This as previously mentioned is accomplished by the chain trip pin 55 and the switches 90a 90b 91a 91b with the following circuit. When the switch 90a is actuated the chain travel relay 104 operates closing relay contacts 104a 104b and starts the chain drive motor 60. The relay 104 remains closed through the switches 90b

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91b which are in series, until the trip pin 55 has travelled around the chain sprocket 54 and trips the switch 90b. The tripping of the switch 90b releases the relay 104 and the motor 60 is stopped and is again under the control of the chain control switch 80 as previously described. The switches 91a 91b on the other end of the rows of switches operate in a like manner the switch 91 closing the relay 104 and so on.

It should also be mentioned that while the accompanying drawings and preceding description refer to the switch assemblies 20 as having two contact blades 26a 26b the same arrangement could be utilized with a three bladed switch with the central blade being contacted by the actuating member extension 34. This would be necessary if some means were incorporated in the present switch arrangement for applying a variation to the intensity of the power supplied to the individual lamps controlled for example to give the lamps a flickering effect simulating candles.

I claim

1 A time switch mechanism adapted to control the selective intermittent energization of a plurality of electrical circuits singly and in sequence and to maintain each of said selective energizations for a delayed constant period of time, said mechanism comprising in combination a plurality of individual switch assemblies disposed in at least one aligned row with each switch assembly having a pivotally mounted actuating member and controlling a single circuit, intermittently driven switch actuation controlling means including a contact member adapted to engage and pivot said switch assemblies switch actuating member in sequence to first position along said switches said controlling means being mounted adjacent to and adapted to intermittently travel the length of said row of switch assemblies in even increments a driving means for said controlling means a first controlling switch connected to and adapted to intermittently energize said driving means and a constantly driven switch restoring means mounted adjacent to and extending the length of said row of switch assemblies and adapted to be engaged in sequence by said switch assemblies actuating members on individual intermittent actuation by said controlling means contact member and to individually and continuously restore in a predetermined delayed constant period of time said switch assemblies thus in turn actuated.

2 A time switch mechanism as claimed in claim 1 wherein said controlling means comprises an endless chain disposed above said aligned switch assemblies and said contact member is mounted on and extends from said chain into a path intersecting the upper ends of said pivotally mounted switch assemblies actuating members.

3 A time switch mechanism as claimed in claim 1 wherein said common switch restoring means comprises at least one constantly driven elongated splined shaft extending in juxtaposed relationship with and transverse to said switch assemblies actuating members.

4 A time switch mechanism as claimed in claim 1 wherein said controlling means on each actuation travels in single increments corresponding to the spacing between each of said switch assemblies.

5 A time switch mechanism adapted to control the selective energization of a plurality of electrical circuits singly and in intermittent sequence and to maintain each of said selective energizations for a constant period of time said mechanism comprising in combination a plurality of individual switch assemblies disposed in equally spaced relationship and at least one aligned row with each switch assembly having a pivotally mounted actuating member and controlling a single circuit, intermittently driven switch actuation controlling means including a contact member adapted to engage and pivot said switch assemblies contact members in sequence and being mounted adjacent to and adapted to travel the length of said row of switch assemblies in even increments, a driving means for said controlling means, a coin actuated controlling

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switch connected to and adapted to intermittently energize said driving means upon each coin deposit and a constantly driven common switch restoring means mounted adjacent to and extending the length of said row of switch assemblies and adapted to be engaged by said divided switch assemblies actuating members on intermittent sequence of actuation by said switch controlling means contact member and to individually and continuously restore interrupted constant period of time switch assemblies thus initially actuated

6 A time switch mechanism as claimed in claim 5 wherein said intermittently driven switch actuation controlling means comprises an endless chain disposed about said aligned switch assemblies and said contact member is mounted on and extends from said chain to a path intersecting said switch assemblies actuating members

7 A time switch mechanism as claimed in claim 6 wherein there are two opposed rows of spaced aligned switch assemblies and said endless chain travels about both rows

8 A time switch mechanism as claimed in claim 5 wherein said switch actuation controlling means travels in increments corresponding to the spacing between each of said switch assemblies

9 A time switch mechanism as claimed in claim 5 wherein said common switch restoring means comprises at least one constantly driven elongated splined shaft extending in juxtaposed relationship with and transverse to said switch assemblies actuating members

10 A time switch apparatus adapted to control the selective energization of a plurality of electric lamps in a votive light arrangement singly and in sequence and to maintain each of said selective energizations for a constant period of time, said apparatus including a co-operated actuating switch a plurality of individual switch assemblies disposed in spaced relationship and in at least one aligned row with each switch assembly controlling a circuit to one of said lamps and having a partially mounted rack holder provided with a sliding rack portion and an endless switch actuating chain mounted for intermittent travel along the length of said row of switches and including a switch contact plate following a path

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intersecting one end of each of said switch assemblies rack holders chain driving means and control means for said chain driving means adapted to move said chain in even increments connected to and initially actuated by said coin operated switch a common switch restoring means consisting of at least one elongated splined shaft supported for rotation in juxtaposed relationship with and extending the length of said aligned switch assemblies rack holders means for constantly driving said splined shaft whereby control of said chain contact plate with each successive one of said switch assembly rack holders is adapted to pivot said holder completing the respective circuit, and the sliding rack portion of said holder is placed in meshed engagement with said shaft and by said shaft and in a predetermined constant delayed time period is restored to its original position breaking said circuit

11 A time switch apparatus as claimed in claim 10 wherein there are two opposed rows of aligned switch assemblies and said switch actuating chain travels about both rows said common switch restoring means including two opposed splined shafts in meshed engagement for counter rotation between said opposed switch rows

12 A time switch apparatus as claimed in claim 10 wherein each of said switch assemblies includes opposed resilient contact blades and said rack holder includes a projecting portion adapted to engage one of said contact blades

13 A time switch apparatus as claimed in claim 10 wherein said chain driving control means includes a switch having a contact arm disposed in the path of said chain and adapted for sequential actuation by each of the connecting members between each link of said chain

14 A time switch apparatus as claimed in claim 10 wherein said actuating chain travels in increments corresponding to the spacing between said switch assemblies

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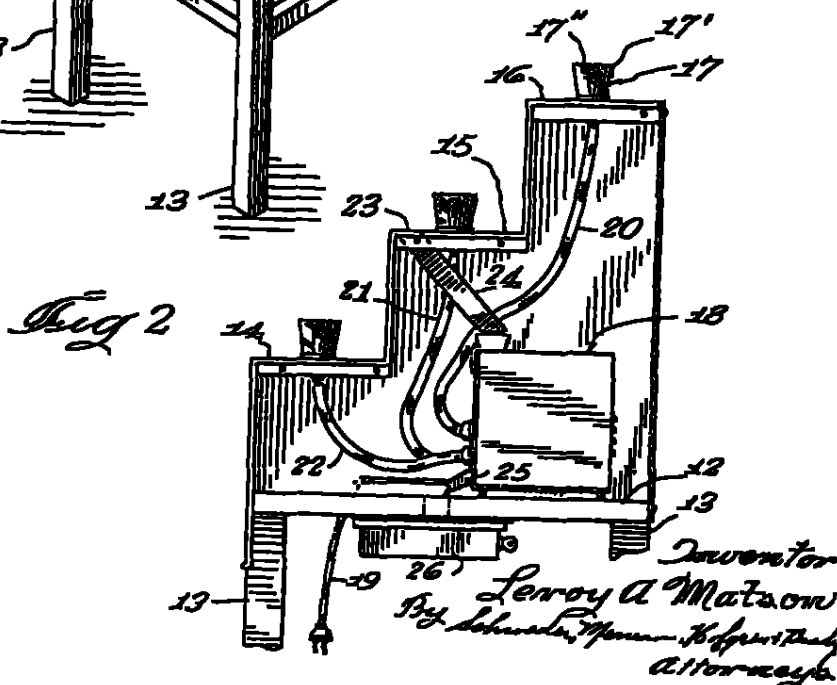
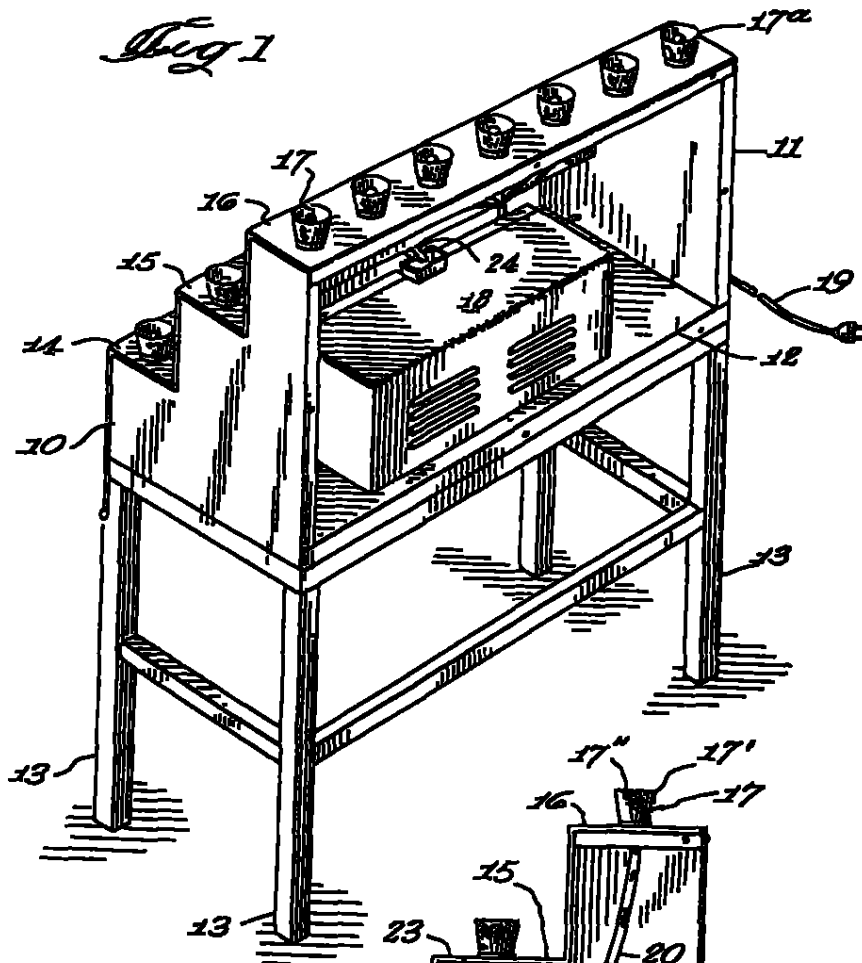
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L A MATSON
VOTIVE LIGHT SYSTEM

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filed April 29 1950

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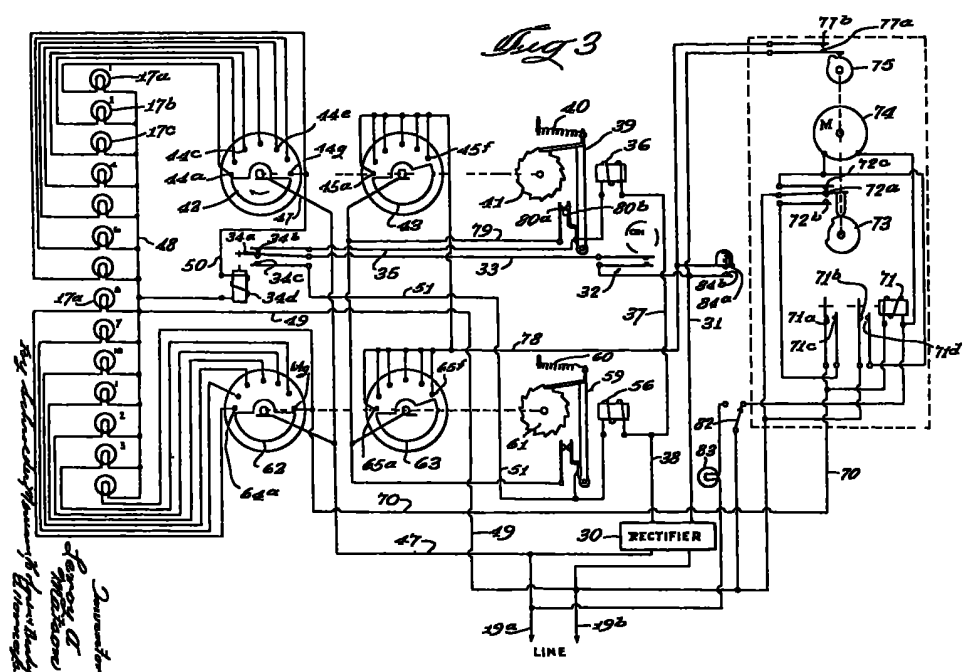
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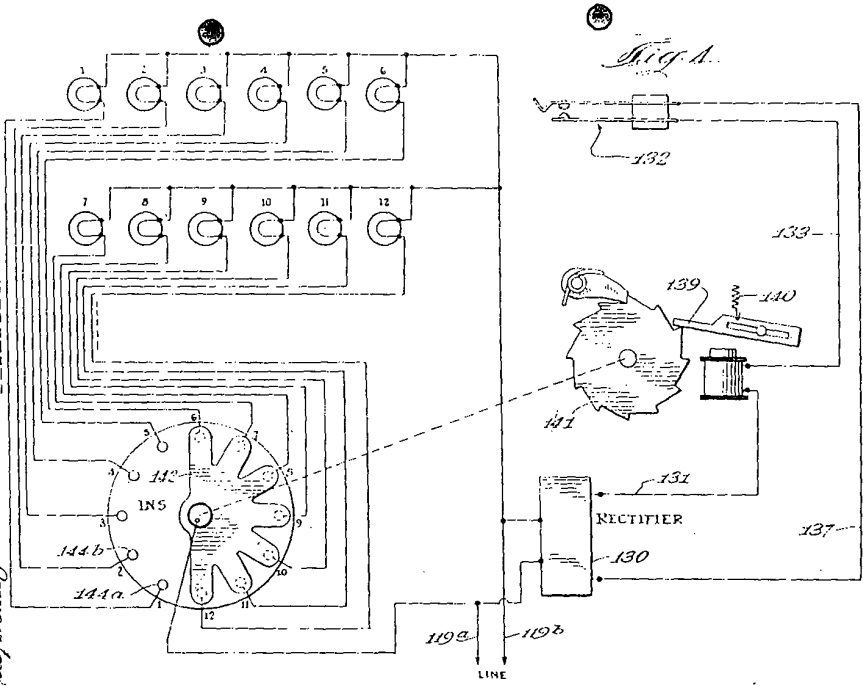
Filed April 29 1950

VOTIVE LIGHT SYSTEM

3 Sheets-Sheet 2



Transmitter
of light or
other energy
to the body
of the system



Approved:
George A. Matson
By: Abraham M. Matson, Attorney

Patented Nov 3, 1953

2,658,168

UNITED STATES PATENT OFFICE

2 658 168

VOTIVE LIGHT SYSTEM

Leroy A. Matson, Park Ridge Ill. assignor by
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cago Ill.

Application April 29 1950 Serial No. 159,000

10 Claims (CI 315-319)

1 This invention relates to a votive light system and more particularly to a votive light system of the electrical type and means for automatic control of certain desired operations in such a system.

Stands holding a number of candles for religious and sacrificial purposes have of course been used for centuries and more recently electric votive lights and stands therefor have come into use and have received considerable favor. Such votive light stands can be given the same appearance and all of the religious connotations of the former types using an open flame but with the elimination of grease and smoke and the cleaning and filling of glasses the practically complete elimination of any fire hazard and a very great reduction in maintenance.

The electric votive light systems previously used insofar as they are known to applicant have had a number of disadvantages which are here being eliminated and overcome by the improved and more fully automatic systems hereafter disclosed.

One feature of my improved systems is that a single coin-operated actuating switch is enabled to effect energization of the votive lights in a predetermined desired sequence upon successive operations of such a switch. Another feature of this invention is that all or a desired number of the lights previously energized are maintained energized upon further successive operations of the coin switch. Yet another feature of this invention is the provision of means for automatically deenergizing any desired number of lights from one to all of the lights upon energization of a given light as a succeeding light in a group or the last light of a group. A further feature of this invention is that a predetermined time interval (up to many hours if desired) can be provided before the lights are automatically deenergized and yet a further feature of this invention is that manual deenergization of the lights can be conveniently effected when desired.

Other features and advantages in my system will be apparent from the following specification and drawings in which

Figure 1 is a perspective view from the left and back of one form of apparatus embodying my invention.

Figure 2 is a view of the device shown in Figure 1 from the left of such figure and with that side removed.

Figure 3 is a combined schematic and circuit diagram of one type of circuit which I have developed for use in such apparatus and

2 Figure 4 is a similar diagram of another and simplified arrangement.

The votive light system which I am here disclosing provides the advantages I desire in the way of a single coin-operated actuating switch automatic deenergization of lights when desired and the like yet does this in a manner which enables my invention to be embodied in several alternative forms. These variations not only meet substantial differences in the number of votive lights to be controlled but also individual preferences as to the manner in which the votive lights are to be energized and deenergized automatically. My fully automatic system can be used in quite simplified form for a relatively small number of lights or embodied in a form adapted to handle a large number of votive lights as for example from 40-50 or even 100 such lights and to provide any desired length of time after energization of all of a certain number of the lights before any lights are deenergized.

When I speak of votive lights throughout the specification and claims of this application it will be understood that I am referring to the type of light usually used for religious or sacrificial purposes and am using the term "votive light" in a broad sense to cover any such lights even though these sometimes have other terms applied thereto as vigil lights. It is my intent that the term "votive light" cover any type of light illuminated for religious purposes such as prayer remembrance sacrifice or the like regardless of the length of time they may be caused to burn and whether or not they might sometimes be called vigil lights in their longer burning form and the like.

In the particular embodiment of my invention illustrated herewith a stand of conventional construction but shown without ornamentation for simplicity of illustration is shown as having sides 10 and 11 and a bottom 12 all supported by suitable legs 13 and as having its front portion arranged in stepped tiers 14 15 and 16. The particular stand illustrated has three such tiers with seven lights being shown on each tier but it will be understood that this is for purposes of illustration only of one of the smaller sizes of votive light stands conventionally used and that my invention is equally applicable to stands of 40-50 or 100 lights. The lights on each tier are identical. The light 17 for example is illustrated as consisting of the conventional red glass 17 having therein an electrically energized light 17 which may simulate a candle in appearance.

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The control equipment comprising the operative portion of my votive light system is preferably contained in a single removable unit or cabinet here identified in general as 18 facilitating installation and servicing. This unit would be connected to a conventional power supply as 110 volts A C by a conventional two wire cord here identified as 19 and would have receptacles adapted to receive cable plugs of the cables identified as 20, 21 and 22. These last mentioned cables (one for each tier of lights) would involve one more wire than the number of lights in each row eight wires in this case and would be permanently wired to the sockets of the votive lights on each of the various tiers of the stand. The plug connections however enable ready removal of the unit 18 with its control mechanisms. A single coin slot 23 is here shown as near the center of the middle tier although it will be understood that it can be located at any convenient position and it is connected by a coin chute 24 to an opening in the top of the unit 18. A coin deposited in the slot 23 passes through the chute 24 and through a coin passageway in the unit (operating a coin controlled actuating switch in so doing) to then pass out of the bottom of the unit 18 through a chute here identified as 25 to any convenient coin receptacle here shown as the locked box 26 immediately under the bottom of the stand.

Referring now more particularly to Figure 3 I will describe a control and operating arrangement of a kind adapted to be housed in the cabinet or unit 18. In order to provide a diagram of a character which could be illustrated on a single sheet the diagram of Figure 3 shows an arrangement energizing only two banks of seven lights each but it will be understood that each bank or tier could contain a larger number of lights and that there could be three or any desired number of such tiers of lights merely by the provision of a larger number of contacts on each stepping switch and further stepping switches if desired.

Referring now to Figure 3 a pair of wires 19a and 19b provide the source of power as for example 110 volts for energizing the apparatus. This is utilized directly to energize the lamps in the particular embodiment illustrated as will be apparent more particularly in later portions of the description and is converted to a type of power appropriate to energize the stepping relays as by being reduced to 12 volts direct current by the rectifier 30. One side of this D C output is passed through a wire 31 to one side of the normally open contacts in the coin switch 32. This may be any conventional commercial type the contacts being adapted to be momentarily closed by a coin. When these contacts are closed the circuit continues through the wire 33 through the normally closed contacts 34a and 34b of a single pole double throw relay and through the wire 35 to the actuating coil 36 of the stepping relay whence the circuit is completed through the wires 37 and 38 back to the other side of the rectifier. This momentary energization of the actuating coil 36 pulls the movable armature 39 to the right (as illustrated in Figure 3) against the pull of the spring 40 and the moment the circuit is deenergized by opening of the coin switch contacts after passage of the coin therethrough the spring pulls the armature back to the left and rotates the ratchet wheel 41 one step. As illustrated in the drawings because of the location of the actuating coil this rotation is counterclockwise but it will be understood that the shaft connecting this ratchet wheel to the movable contact arrangements of the stepping switch proceeds out of the face of the ratchet wheel 41 as viewed in Figure 3 and into the face of the rotatable members 42 and 43 of the two contact sections so that these rotate clockwise as viewed in Figure 3.

Referring now to the light operating portion of the stepping switch it will be seen that this comprises contacts 44a to 44g adapted to be contacted by the rotary contact completing member 42 the arrangement being such that if operation of the stepping switch by a coin moves the rotary member $\frac{1}{4}$ of a circle in the example illustrated so that one contact at a time is successively completed upon the first coin effected operation of the actuating switch 32 the stepping relay moves one step to bring the contacting member 42 into engagement with the contact 44a. This completes a circuit directly from the 110 volt source through the wire 47 the contacting member 42 the contact 44a the light 17a and the common return wires 48 and 49 to the other side of the power source thus energizing the lamp 17a.

Upon successive operations of the coin switch and consequent stepping movements of the stepping relay contacts 44b, 44c etc would be successively engaged by the movable contacting member 42 to energize the lights 17b, 17c etc. It is to be noted that during the successive illumination of lights in predetermined sequence the lights previously energized are maintained energized by the continued contact of other portions of the contacting member 42. While this is illustrated for convenience as a single substantially semi-circular contact member it will be understood that it can equally well be a plurality of individual contact figures. In any case successive operations illuminate further lights in a predetermined sequence so that each coin deposited by a worshipper effects illumination of a votive light but at the same time lights energized only a short time before do not go off but are maintained lit.

In the particular form illustrated the contact 44g which completes the circuit to the last light on the top tier for example also completes a circuit through the wire 49 to the energizing coil 34d of the previously mentioned relay causing the normally closed contacts 34a and 34b to be opened and causing closure of the contacts 34a and 34c. After this change in the relay is effected further operations of the coin switch 32 complete a circuit through the wire 51 energizing the actuating coil 56 of another stepping switch. This switch includes an armature 59, spring 60, ratchet wheel 61 and contacting member 62 analogous to parts of the other stepping switch identified by reference numerals 20 higher in each case so that the detailed description will not be repeated. The deposit of further coins thus leaves the first row of lights illuminated and successively illuminates or energizes lights in the second row the first coin stepping the switch once to bring the contacting member 62 into engagement with the contact 64a to illuminate the light 17a the next operation of the coin switch effecting energization of the next successive light while maintaining the circuit to the first light of this row etc.

It will be understood that another stepping switch could take care of the third row and be brought into operation by another relay similar

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to the relay 34 and actuated upon completion of the last contact 64g. It will also be understood of course that there could equally well be a larger number of lights in each row as twenty lights needing only a stepping switch with twenty contacts or that a single twenty contact stepping switch could be used to actuate two rows of ten lights each followed by another stepping switch coacting two more rows of ten lights each etc.

After all or a given number of the lights in a votive stand have been illuminated I desire to provide for automatically deenergizing all of the lights after a desired period of burning. An arrangement for deenergizing all of the lights after illumination of the last light is illustrated in Figure 3 and particularly the right hand portion thereof. When the contacting member 62 finally reaches the contact 64g (assuming for purposes of simple illustration that this is the last light on the votive stand) a circuit is completed through the wire 70 to the actuating coil 71 of a single throw double pole relay causing the movable contacts 71a and 71b (normally open) to come into engagement with the fixed contacts 71c and 71d. A circuit is then completed from one side of the 110 volt source through the contacts 72a and 72b (which would be closed at this time by virtue of the cam follower being in the lower portion of the cam 73) and through the contacts 71b and 71d to energize the timer motor 74 the shaft carrying the cams 73 and 75 being gear driven by this motor in such a way as to make one revolution in four hours for example or any other given desired time which has been predetermined by selection of the gear ratio or which may be changed by altering the ratio.

The cams are shown in a position near the end of this period just before homing operation of the stepping switches is to be effected to deenergize all of the lights. It will be noted that after the timing motor has run for a very short period the raised portion of the cam 73 (rotating clockwise as illustrated) comes into action and causes the contact 72a to leave the contact 72b and close with the contact 72c thus keeping the timing motor in operation regardless of the setting of the relay 71. Just before the lower portion of the cam 73 is again reached (which would reopen the contacts 72b and 72c illustrated as closed in the drawing) the raised portion on the cam 75 would close the normally open contacts 77a and 77b. This results in 12 volt current from the rectifier passing through the wire 31 and being delivered through the wire 78 to the contacts 45a to 45f on the homing section of the stepping switch illustrated in the upper portion of the drawing and 65a to 65f in the other stepping switch. Since the contacting members 43 and 63 in the homing portions of these switches (being mounted on the same shaft as the other contacting members in each case) would then be in a position 180° from that illustrated in the drawing and in contact with all of the contacts homing actuation would take place.

Since this operation is identical in both switches only one need be described. Referring to the switch in the upper portion of the drawing it will be seen that current is then delivered from the contacting member 43 through the wire 79 and the normally closed contacts 80a, 80b to the actuating coil 36. Current flow through this coil moves the armature 39 to the right breaking the circuit and allowing the spring to effect a

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step of movement of the ratchet wheel 41. However as soon as the armature 39 moves to the left to the position illustrated in the drawings the contacts 80a and 80b are again closed and since all but one of the contacts in the homing portion of the switch are still engaged by the contacting member 43, another homing step immediately takes place. These homing steps thus take place repeatedly in very rapid sequence so that the switch parts are returned to the position illustrated in the drawing in a very short period of time usually a second or two. Since the last contact is not connected the homing operation stops and no further movement of the stepping switch parts takes place when the contacting members thereof have assumed the position shown in the drawings.

The votive light stand is then ready for use again and it will be apparent that if there are several such stands one would normally always be available for a person who desired to use the same. Meanwhile the stepping operation has caused deenergization of the relay 71 and when the cam 73 has moved a few degrees further opening of the contacts 72a and 72c opens the circuit of the timing motor 74 and leaves the timing portion of the system inoperative and deenergized until all of the votive lights have again been illuminated one by one by successive operations of the coin switch.

Under certain circumstances however it may be desirable to be able to effect deenergization of all of the lamps manually at an earlier or later time than would otherwise be normal and the system illustrated also makes provision for this. If the manual switch 82 is thrown from the normal position illustrated to its other contact the timer is out of circuit. Under such circumstances I prefer to have a pilot light 83 illuminated to call attention to the inoperativeness of the timer. Manual deenergization of the lamps can then be effected at any time desired longer or shorter than the period provided by the timer by closure of the manual switch (as a pushbutton) comprising the contacts 84a and 84b this having the same homing effect on the stepping switches as automatic closure of the contacts 77a and 77b.

Moreover if the switch 82 is in the normal position illustrated in the drawings the lights can be cleared earlier than would be normal by manual closure of the contacts 84a and 84b the timer then running through its cycle of operation without effect on the system until the deenergizing contacts 77a and 77b are closed whereupon deenergization of all lights then illuminated would take place. Because of this latter action I prefer to cut the timer out of circuit by operation of the switch 82 at any time there is to be manual control of illumination.

It will also be understood that where there are a plurality of stepping switches deenergization of lights controlled by one such switch can be effected by closure of the last contact on another switch rather than by use of a timer. That is if the votive light stand contains two rows of seven lights as illustrated in Figure 3 for simplicity the homing control circuit for the upper stepping switch could be completed through a circuit including the contact 64g and the contacts 34b and 34c, being arranged to deenergize the relay 34 upon completion of homing of the upper stepping switch. Accordingly when all fourteen lights have been energized the drop

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ping of the coin which effected energization of the last light in the second row would also effect clearing or deenergization of all lights in the first row whereupon the dropping of the next coin would re illuminate light No 1 in the first row the next coin would illuminate light No 2 in the first row etc. At the completion of illumination of all lights in the first row energization of the last light could similarly effect clearing of the lower stepping switch and the lights controlled thereby the relay 34 in such case preferably being of a time delay type enabling this to take place before the contacts moved over to render the second stepping switch operative upon further operations of the coin switch

Referring now more particularly to Figure 4 a simplified version of my system is illustrated this form embodying my invention in a manner particularly suitable to a votive light stand used relatively infrequently. The line wires 119a and 119b provide power to energize the lights here shown for simplicity as constituting two rows of six lights each although it will be understood that a different number in each row and a greater number of rows may be used if desired. In this case a very simple stepping switch may be used with no need of any homing arrangement. Actuation of the coin switch 132 completes a circuit from the rectifier 130 through the wires 131 133 and 137 to effect a downward movement of the armature member 139 and a step of movement of the ratchet wheel 141 reference numbers 100 higher than corresponding parts being used so that complete detail of description need not be repeated here. In the particular form illustrated the multi fingered movable contacting member 142 is illustrated as having seven contact fingers although it will be understood that any appropriate number may be used and as moving on a contact member having twelve contacts 144a etc.

In this form of device as illustrated seven of the lights will always be illuminated. In the particular position of the parts shown lights 6 to 12 inclusive are energized and the next operation of the coin switch causes energization of light No 1 while maintaining lights 7 to 12 inclusive lit but at the same time causes deenergization of light No 6. Similarly the next operation of the coin switch 132 effects illumination of light No 2 by engaging contact 144b and maintains energization of lights 8 to 12 and light No 1 but deenergizes light No 7. Accordingly each person dropping a coin would have his votive light illuminated for the length of time involved before seven further coin operations have taken place. This maintains the particular light illuminated under normal conditions during the length of time that the person originally causing its illumination remains in the church or other location of the votive light stand.

While I have shown and described certain embodiments of my invention it is to be understood that it is capable of many modifications. Changes therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim

1 Votive light actuating apparatus including a single actuating switch means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and means for maintaining energized at least several of the

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previously energized lights upon successive operations of said actuating switch the lights remaining energized for a period of time independent of the time when lit.

2 Votive light actuating apparatus including a single actuating switch means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and means for maintaining energized at least several of the previously energized lights upon successive operations of said actuating switch and upon energization of a certain light for effecting deenergization of at least a certain previously energized and maintained light.

3 Votive light actuating apparatus including a single actuating switch means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation means for maintaining energized at least several of the previously energized lights upon successive operations of said actuating switch and means actuated upon energization of a certain light for effecting deenergization of a plurality of the previously energized and maintained lights.

4 Apparatus of the character claimed in claim 3 wherein the last mentioned means includes a timer for effecting deenergization at a predetermined time interval after energization of said certain light.

5 Votive light actuating apparatus including a single coin operated actuating switch and a stepping switch with initial and following contacting means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and for maintaining energized all of the previously energized lights in a predetermined group upon successive operations of said actuating switch the lights remaining energized for a period of time independent of the time when lit.

6 Votive light actuating apparatus including a single coin operated actuating switch a stepping switch with initial and following contacting means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and for maintaining energized all of the previously energized lights in a predetermined group upon successive operations of said actuating switch and means including a timer actuated upon energization of the last light of a predetermined group for effecting deenergization of the entire group of lights at a predetermined time interval after energization of said last light.

7 Votive light actuating apparatus including a single coin operated actuating switch a stepping switch with initial and following contacting means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and for maintaining energized at least some of the previously energized lights upon successive operations of said actuating switch a second similar stepping switch connected to a second group of lights and means actuated upon energization of the last light of the group connected to the first stepping switch for causing the coin operated switch to thereafter actuate the second stepping switch at least some of the lights in both groups remaining energized for a period of time independent of the time when lit.

8 Votive light actuating apparatus including a single coin operated actuating switch a step

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ping switch with initial and following contacting means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and for maintaining energized all of the previously energized lights upon successive operations of said actuating switch a second similar stepping switch connected to a second group of lights means actuated upon energization of the last light of the group connected to the first stepping switch for causing the coin operated switch to thereafter actuate the second stepping switch and means including a timer actuated upon energization of the last light of a predetermined group for effecting deenergization of all of the lights at a predetermined time interval after energization of said last light

9 Apparatus of the character claimed in claim 8 including manually operated switch means for also effecting deenergization of all of the lights

10 Votive light actuating apparatus including a single coin operated actuating switch and a

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stepping switch with initial and following contacting means for energizing said votive lights in a desired sequence upon repeated operation of said actuating switch one light for each said operation and for maintaining energized all of the previously energized lights in a predetermined group upon successive operations of said actuating switch the total number of contacting means being less than the number of lights and contacts therefor

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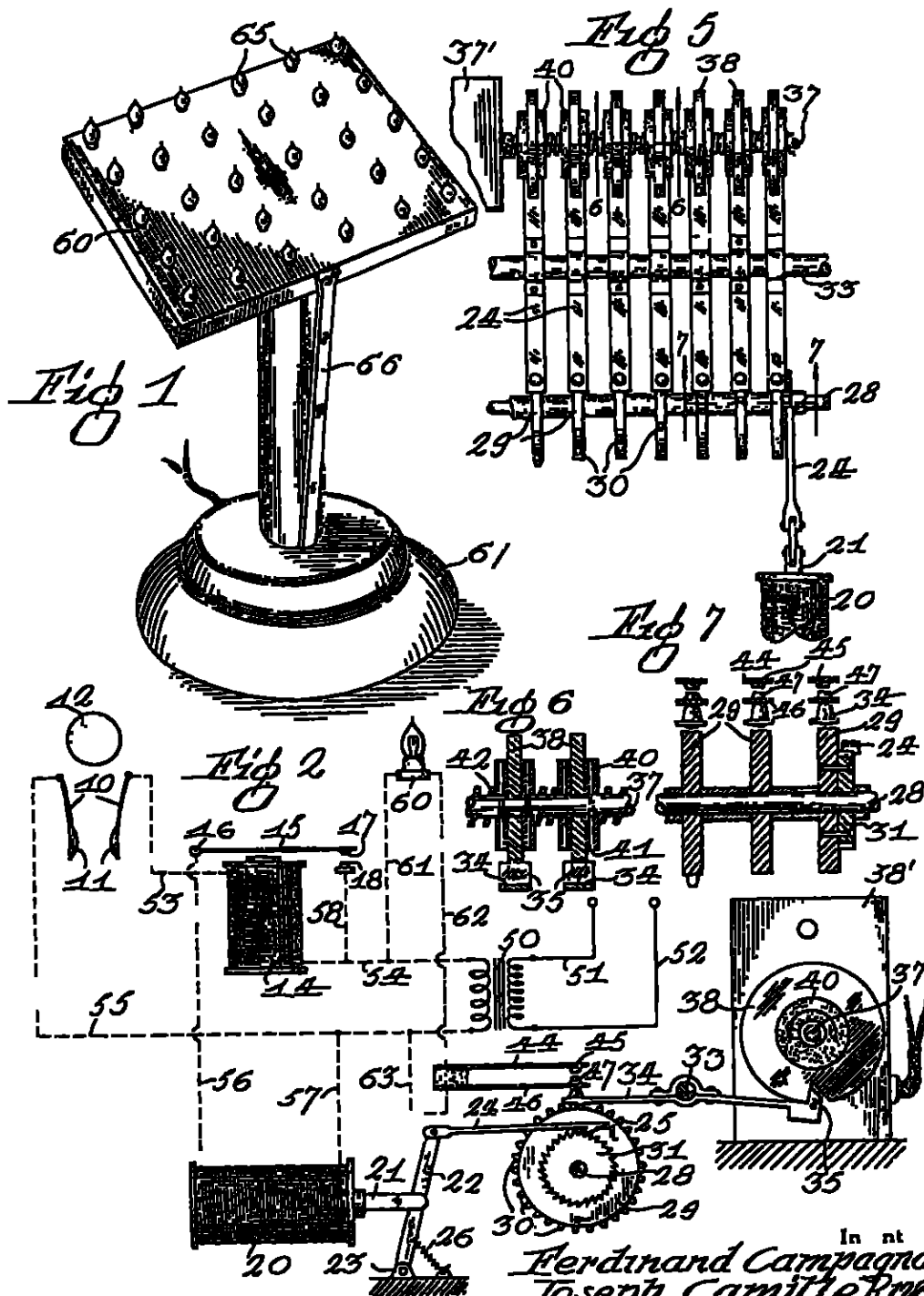
F CAMPAGNA ET AL

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COIN CONTROLLED TIME SWITCH MECHANISM

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2 Sheets-Sheet 1



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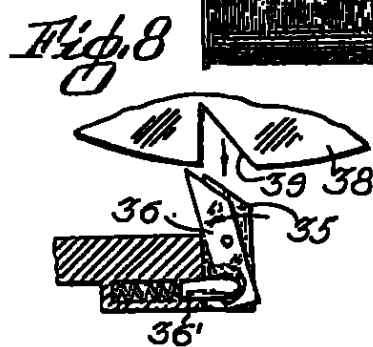
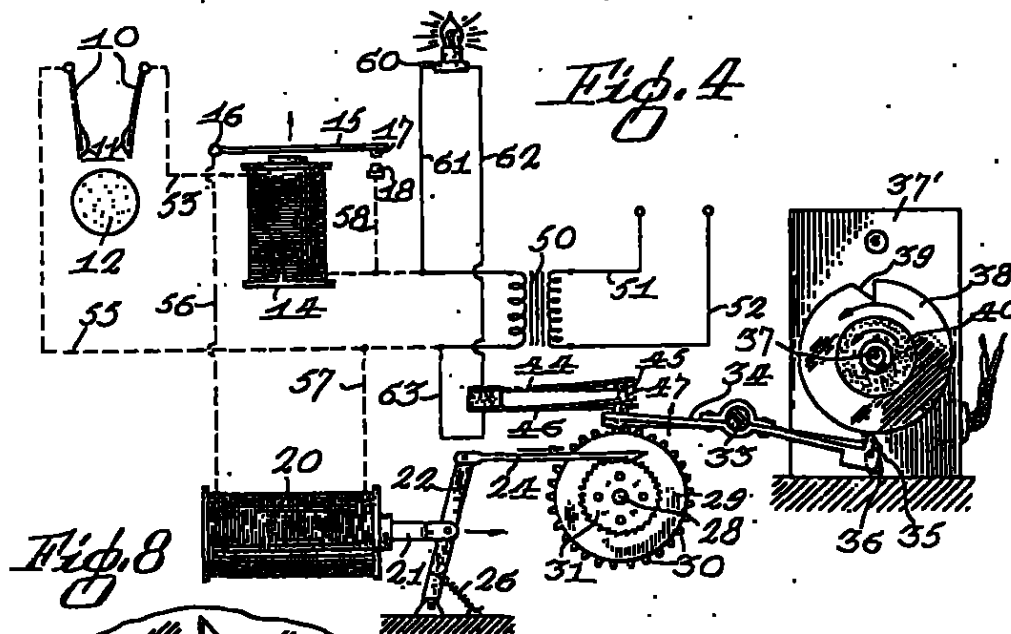
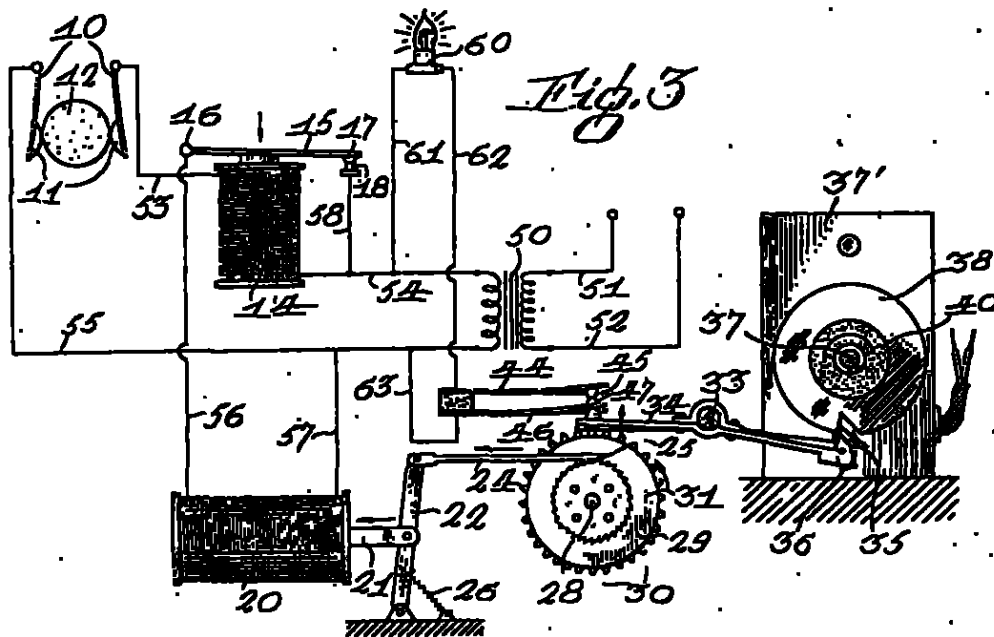
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2,034,744

COIN CONTROLLED TIME SWITCH MECHANISM

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2 034 744

COIN CONTROLLED TIME SWITCH MECHANISM

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In Canada October 3 1933

3 Claims (Cl 200—10)

The present invention relates to improvements in coin controlled time switch mechanisms.

An important object of the invention is the provision of coin controlled mechanism for closing an electric circuit for a predetermined time period.

A further object of the invention is the provision of switch operating mechanism whereby one or more electric light circuits may be operated for selected time periods by coin controlled means.

Another object of the invention is the provision of switch operating mechanism including coin controlled switch closing means and mechanism actuated by the switch closing means for retaining a light circuit switch closed for a predetermined period of time.

Still another object of the invention is the provision of switch operating mechanism which will be efficient and reliable in operation.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawings forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same.

Figure 1 is a perspective view of a votive stand with which the switch mechanism is adapted to be associated.

Figure 2 is a side elevational view showing the mechanism assembled for operating a plurality of electric light circuits with the circuit controlling switches in open position.

Figure 3 is a similar view showing the passage of a coin through the coin switch and the initial closing of a circuit switch.

Figure 4 is a similar view showing the timing mechanisms in operative position.

Figure 5 is a fragmentary plan view showing a plurality of assembled timing mechanisms.

Figure 6 is a transverse section taken on the line 6—6 of Figure 5 and

Figure 7 is a transverse section taken on the line 7—7 of Figure 5.

Figure 8 is a detail of the latch mechanism shown in Figures 2, 3 and 4.

Referring to the drawings wherein for the purpose of illustration is shown a preferred embodiment of the invention the numeral 10 designates the controlling switch constituting a pair of complementary spring contact arms provided with arcuate contact knobs 11. The arms of the switch 10 are preferably disposed to assume converging-complementary positions disposed so that

a coin indicated at 12 may be passed between the same and will bridge the contacts 11 during passage through the switch.

One terminal of the switch 10 is electrically connected with an electric magnet-coil 14 having disposed thereabove a vertically movable armature bar 15 supported at one end, as indicated at 16 and carrying a switch contact point 17 at the opposed end. When the coil 14 is de-energized the arm 15 is disposed to assume a position spaced thereabove and upon energization of the coil is adapted to be attracted and swung downwardly. When the arm is swung to a downward operative position the contact 17 attached thereto is disposed to engage a complementary fixed switch contact 18. The auxiliary switch operating coil 14 is to be arranged adjacent an actuating magnet coil 20 having slidably fitted thereon a core 21. The outer end of the core 21 is pivotally connected to the intermediate portion of a swinging lever 22 the lower end of which is pivotally connected with the pivot bracket 23. To the upper end of the lever 22 is pivotally connected one extremity of a pawl 24 the outer free end of the pawl being formed with a hook 25. A tension spring 26 connected to the lever 22 is adapted to swing the lever away from the coil when the latter is de-energized.

Upon a rotary shaft 28 are rigidly secured a plurality of switch closing wheels 29 arranged in parallel spaced relation as shown to advantage at Figure 5. Each of the wheels 29 is provided with a radial tooth 30. To the side of one of the wheels 29 is secured a ratchet wheel 31 formed with peripheral ratchet teeth. The hook 25 of the pawl 24 engages the teeth of the ratchet wheel at the top as shown to advantage at Figure 2.

Upon an intermediate fixed shaft 33 are supported a plurality of rocker levers 34 corresponding in number to the wheels 29 of the assembled mechanism. At one end of each rocker lever 34 is formed an angular enlargement embodying a right angular hook forming extension 35 provided with an elongated slot 36. Within the slot 36 is mounted a catch bar 36 pivotally supported intermediate its ends and having the upper end bevelled. A compression spring 36 mounted in the lower part of the enlargement bears against the lower end portion of the catch bar 36 and tends to normally dispose the same at an angle in the slot so that the upper bevelled end projects at one side of the hook 35. At the opposed end of each rocker is formed a switch engaging knob 37 the top side and arcuate boss at the bottom side engageable by the tooth 30 of the rotary wheel 29.

As illustrated at Figures 2 to 4 inclusive the intermediate portion of each rocker 34 is rotatably journaled on the shaft 33. Upon step by step rotation of the shaft 28 through the medium of the pawl and ratchet mechanism the tooth of each wheel 29 is operable to engage the boss on the rocker and elevate the inner end thereof to effect a switch closing operation as will be described hereinafter.

A rotatably supported drive shaft 37 is connected with and driven at a predetermined rotary speed by means of an electric motor 37 or other source of power. Upon the shaft 37 are mounted at spaced intervals a plurality of timing discs 38 each being provided with a V-shaped indentation or notch 39. The discs 38 are rotatably fitted on the shaft 37 and are resiliently associated therewith so as to rotate with the shaft when unrestrained. The disc holding means embodies a pair of annular clutch plates 40 arranged against the opposed faces of each disc and positively held on the shaft by means of pins 41 extending through the plates and shaft. The plates 40 are resiliently urged against each disc by means of coiled compression springs 42 disposed upon the shaft the clutch plates being adapted to frictionally engage the discs. The hook 35 formed at the outer end of each rocker is engageable with the V-shaped notch 39 in each timing disc.

Immediately above the inner end of each rocker 34 is arranged a circuit controlling switch embodying an upper fixed arm 44 carrying a contact point 45 adjacent its outer extremity and a complementary spring arm 46 carrying a complementary contact point 47. The lower spring arm 46 is formed to normally maintain the contact point 47 spaced from the co-operating contact 45 so that the switch is in open arrangement.

The electric circuit preferably embodies a transformer 50 electrically connected with a source of electrical current through conductors 51 and 52. One arm of the coin engaging switch 10 is connected through a conductor 53 with the magnet coil 14 the opposed terminal of the coil 14 being connected with the transformer through a conductor 54. The complementary arm of the coin switch 10 is connected with the transformer 50 through a conductor 55. The pivoted end of the armature bar 15 connects with the coil 28 through a conductor 56 while the opposed terminal of this coil connects with the conductor 55 through a wire 57. The fixed switch contact 18 is connected with the conductor 54 through a conductor 58.

In the present example the mechanism is shown assembled for coin controlled operation of a plurality of votive light circuits, each circuit embodying a socket 60 having one side connected with the conductor 54 through the medium of a conducting wire 61. The other side of each socket is connected with the fixed bar 44 of a light circuit controlling switch through a conductor 62. The lower spring bar 46 of the light circuit switch is connected with the conductor 5 through a conducting wire 63.

When a coin or check of predetermined size is introduced into a chute or other guide means directing the same through the complementary arms of the main switch 10 the coin passes between the switch arms and bridges the same causing momentary closure of the switch. During the passage of the coin through the switch 10 the magnet coil 14 is initially energized causing the bar 15 to swing towards the coil and causing engagement of the points 17 and 18 of the coil actuated switch as shown at Figure 3. Closure of

the magnet actuated switch closes the circuit through the coil 28 which upon becoming energized will cause the core 21 to slide inwardly and swing the lever 22 toward the coil. During the inward swinging movement of the lever 22 the pawl 24 will cause partial rotation of the ratchet 31 and wheel 29 attached thereto at which time the tooth of one of the wheels 29 will move into rocker swinging position that is the tooth will move through the upper arc and cause elevation of the inner end of the rocker and closure of the light circuit switch. When the inner end of the rocker is thus elevated the hook 35 of the opposed end will swing downwardly to disengage the notch 39 of one of the timing discs so that the liberated disc will be rotated with the time shaft 37. As the tooth 30 disengages the inner end of the rocker the point of the hook 35 will contact with the annular peripheral edge of the timing disc 38 so that the rocker is maintained in switch closing position until the rotating disc completes a complete timed revolution. When the notch 39 returns to its starting position the hook 35 will slide therein so that the inner end of the rocker is lowered and the light circuit switch automatically opened.

Inasmuch as the discs 38 operate at a relatively low speed the catch bars 36 are provided to prevent reentry of the hooks 35 into the notches 39 immediately following release movement of the hooks and until such time as the discs have completed a full turn movement.

As shown in the drawings the wheels 29 are disposed so that the teeth thereof will be successively moved into engagement with the respective rocker arms so that the entire series of lights may be illuminated for a timed period in successive order.

In order to light one of the votive light bulbs indicated at 65 it is merely necessary to deposit a coin of designated character or a similar check piece into the coin chute indicated at 56 from whence it is conducted into and through the control switch 10. The switch actuating mechanism which will be housed in a casing 67 at the bottom of the stand will thus be placed in operation so that one of the lights will be illuminated and retained in such condition for a selected period of time.

It is to be understood that the form of our invention herein shown and described is to be taken as a preferred example of the same and that various changes as to the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described our invention we claim —

1. A time switch mechanism comprising an electro-magnetically actuated ratchet wheel a shaft connected to said wheel a disc on said shaft a projection on the disc a pivoted rocker adapted to be lifted at one end by the projection of the disc a hook at the other end of the rocker a frictionally rotated wheel having a notch adapted to receive said hook whereby rotation of the friction wheel is suspended and a pair of electric contacts adapted to be closed by the raising of the rocker by the disc projection this action causing at the same time release of the friction wheel and rotation thereof for a complete revolution before the rocker hook again engages the notch of said wheel.

2. In time switch mechanism, a constant-speed

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driven shaft, frictionally driven notched discs
mounted on said shaft rockers having one end
adapted to engage the discs notches to prevent
rotation thereof and electro magnetically actu
ated means adapted to successively lift said
rockers out of engagement with the discs, into
electric circuit closing position said position be
ing retained until the discs have completed a full
revolution to again present the notch into which
the rockers ends will drop into circuit opening
position

3 In time switch mechanism a shaft driven at
a constant speed discs frictionally mounted on
said shaft said discs having a notch pivoted
rockers having one end provided with a hook

adapted to drop into the notch of the discs to
prevent rotation thereof electric circuit-closing
contacts adapted to be closed by the other end
of the rockers a plurality of toothed discs adapt
ed to successively raise the rockers into contact
closing position out of the discs notches and elec
tro magnetically operated ratchet means adapted
to step advance the toothed discs into rocker
raising position the released friction discs ro
tating for one full revolution before being hook
arrested whereby dropping of said hooks into the
notches will open the electric circuit contacts

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Señor
JOSÉ JOAQUIN URIBE SAUZA

REFERENCIA:	Radicación No.	04-206132
	Solicitud Internacional	PCT/IB02/02077
	Fecha inicio fase nacional	04-11-2004
	Trámite	011
	Evento	379
	Actuación	416
	Oficio No.	749
	Folios	001

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en la Decisión 486 de la Comisión de la Comunidad Andina, el Tratado de Cooperación en Materia de Patentes (PCT), el Reglamento y la Circular Única de la Superintendencia de Industria y Comercio, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial.

Cúmplase
Dado en Bogotá DC

22 Nov. 2004


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones