

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO	
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DEP: 2020 DIRECCION DE NUEVAS CREACIONES	EVE: 378 FASE NACIONAL INCLUIDO CAPITULO I
TRA: 11 PCT-PATENTE DE INVENCION CAPITULOS I Y II	FOLIOS: 10
ACT: 519 TRASLADOINFORME	

DIRECCIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado(a)/Señor(a)
SILVANA MARÍA LÓPEZ DÍAZ

Asunto: Radicación: 14-188339- -4
 Trámite: 11
 Evento: 378
 Actuación: 519
 Oficio: 4577
 Folios: 10

Patente de Invención	X			Patente de Modelo de Utilidad	
Vía Nacional					
Vía PCT (Fase Nacional)	X	Capítulo I	X	Capítulo II	
No. Solicitud Internacional	PCT/US2013/029578				
Fecha de Presentación Internacional	07/03/2013				

Como resultado del examen de fondo realizado, con fundamento en el Artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se comunica:

1. Documentos estudiados

Descripción:	Rad. N° 14-188339-00000-0000	27/agosto/2014
Reivindicaciones:	Rad. N° 14-188339-00000-0000	27/agosto/2014
Dibujos:	Rad. N° 14-188339-00000-0000	27/agosto/2014
Prioridad(es):	US 61/608.080	07/marzo/2012

2. Análisis de la Prioridad

Se acepta la reivindicación de prioridad porque ésta solicitud fue presentada dentro del plazo establecido (Art. 9 D 486) y su contenido técnico corresponde con el de la prioridad reivindicada.

3. Objeto de la invención

De acuerdo con lo establecido en el numeral 1.2.2.2 del Capítulo Primero del Título X de la Circular Única para efectos del examen de patentabilidad, se tendrá en cuenta la tasa pagada por el solicitante al momento de comenzar el examen para las

reivindicaciones adicionales; esto es que cuando la solicitud contenga más de diez (10) reivindicaciones y no se haya pagado la tasa complementaria, sólo se estudiarán las cubiertas por la tasa pagada. Por lo tanto, se estudiarán las reivindicaciones 1 a 43.

Título de la solicitud: "Sistemas y métodos para sellar recipientes que tienen un reborde no plano" (Ver página 1 del radicado N° 14-188339-00000-0000).

El problema planteado en esta solicitud consiste en la necesidad de suministrar un método y dispositivo que permita sellar los empaques de productos que tienen rebordes que no descansan en un plano, tal como rebordes curvos o no planos.

Para resolver este problema técnico, la solicitud en estudio proporciona un método para sellar un empaque que contiene un producto alimenticio. El método comprende aplicar una tapa a un reborde no plano que rodea una periferia del empaque de alimento. El método comprende soportar por lo menos una porción del reborde no plano y progresivamente sellar la tapa a la porción soportada del reborde no plano al aplicar presión en uno o más puntos de tangente contra la tapa y el reborde usando un miembro de sellado que tiene una superficie de aplicación de presión que gira alrededor de un eje de rotación y que varía radialmente con relación al eje de rotación y el eje de rotación recíproco.

El objeto de la presente solicitud se relaciona con la Clasificación Internacional de Patentes (CIP): B65B7/16, 7/28; D1/34; D77/20; B29C65/48, 65/78; B51/16; D85/36.

4. De la solicitud de patente

Reivindicaciones (Art 30 D 486, Art 22 PCT)

Las frases "(...) que tiene una superficie de aplicación de presión que gira alrededor de un eje de rotación y uno de los cuales varía radialmente con relación al eje de rotación y el eje de rotación recíproca", en la reivindicación 1, "(...) utilizando una pluralidad de rodillos, por lo menos uno de los rodillos incluye una superficie de corte", en la reivindicación 16, "(...) para aumentar la vida útil del producto alimenticio almacenado en el empaque", indican características estructurales y/o funcionales propias de un aparato o producto, por tanto tales características no son válidas para definir el método debido a que un procedimiento se caracteriza por una serie de etapas o pasos ordenados de forma secuencial que se encaminan a la obtención de un fin. Se sugiere sustituir las mencionadas frases por etapas que ayuden a diferenciar el método del estado de la técnica.

Las reivindicaciones 8 a 15 y 20 a 28 que respectivamente mencionan "(...) el paso de soportar además incluye un paso de suministrar por lo menos un asiento que incluye una cavidad configurada para recibir el empaque con el reborde que está por lo menos en parte fuera de la cavidad", "(...) el paso de progresivamente sellar incluye un paso de suministrar por lo menos un miembro de sellado superior cilíndrico que tiene por lo menos una superficie de sellado configurada para girar y entrar en contacto con el reborde no plano para sellar la tapa al empaque", "(...) el paso de suministrar por lo menos un miembro de sellado superior cilíndrico incluye suministrar dos miembros de sellado superiores cilíndricos donde uno de los miembros de sellado sella una porción de la tapa a una porción del reborde no plano y el otro de los miembros de sellado sella otra porción de la tapa a otra porción del reborde no plano", "(...) el paso de suministrar dos miembros de sellado superiores cilíndricos incluye un paso de girar los dos miembros de sellado superiores cilíndricos a diferentes velocidades", "(...) el paso de progresivamente sellar incluye un paso de suministrar un molde giratorio inferior que

tiene una pluralidad de asientos, cada asiento tiene una pluralidad de superficies de soporte configuradas para soportar el reborde no plano sobre éstas, y un paso de suministrar un miembro de sellado giratorio superior que tiene una pluralidad de superficies de sellado configuradas para entrar en contacto con las superficies de soporte de los asientos para sellar la tapa al empaque”, “(...) el paso de progresivamente sellar incluye un paso de suministrar una superficie transportadora que incluye una pluralidad de asientos, cada asiento tiene una pluralidad de superficies de soporte configuradas para soportar el reborde no plano sobre las mismas, y un paso de suministrar un miembro de sellado giratorio superior que tiene una pluralidad de superficies de sellado configuradas para girar y entrar en contacto con las superficies de soporte para sellar la tapa al empaque”, “(...) además comprende un paso de aplicar la tapa sobre el reborde utilizando un dispositivo de selección y ubicación que incluye un vacío”, “(...) además comprende un paso de suministrar el miembro de sellado que tiene la superficie de sellado que es totalmente no plana”, “(...) porque la tapa está hecha de una película flexible”, “(...) porque la tapa está hecha de una película flexible”, “(...) suministrar un empaque de almacenamiento de alimentos que tiene un reborde no plano”, “(...) el empaque tiene una superficie superior que es totalmente plana”, “(...) el empaque tiene una superficie inferior que es parcialmente plana y parcialmente no plana”, “(...) el empaque incluye una bandeja que tiene al reborde no plano”, “(...) incluye un paso de utilizar el miembro de sellado que tiene una superficie de sellado que varía radialmente con relación al eje de rotación”, “(...) incluye un paso de utilizar el miembro de sellado que tiene un eje de rotación que alterna”, “(...) el reborde no plano tiene una longitud proyectada en una dirección de la máquina que es menor a una longitud a lo largo del reborde en la dirección de la máquina”, no son válidas para restringir el método del cual dependen puesto que dichas reivindicaciones revelan características propias del aparato para sellar el empaque o del empaque es sí mismo, sin añadir ninguna etapa al mencionado método, mezclando así dos tipos de reivindicaciones de producto y de método. Con respecto a lo anterior el Tribunal Andino de Justicia ha dicho lo siguiente:

“El objeto de la invención de producto está constituido por un cuerpo cierto destinado a llenar una necesidad industrial que el estado de la técnica aún no ha satisfecho. En cambio, el objeto de la invención de procedimiento se encuentra conformado por “una serie o sucesión de operaciones que inciden sobre una materia (sólida, líquida o gaseosa) que se encamina a la obtención de una cosa o un resultado”. (Otero Lastres, José Manuel. Ob. Cit)⁽¹⁾.

En la reivindicación 29 se presenta una falsa dependencia toda vez que se caracteriza un producto por el procedimiento llevado a cabo para obtener el mismo, descrito en las reivindicaciones 1 a 28. Se le recuerda al solicitante que las reivindicaciones de método se definen mediante una serie de etapas o pasos para conseguir algún fin, y que las reivindicaciones de producto o dispositivo se definen mediante características técnicas esenciales estructurales que diferencian a dicho producto del estado de la técnica. Es importante resaltar que las reivindicaciones de aparato y de método deben reclamarse cada una en reivindicaciones independientes con sus dependientes respectivas. Asimismo, las reivindicaciones 30 a 32 no son válidas, por las mismas razones anteriormente descritas.

Las frases “(...) configuradas para soportar por lo menos una porción del reborde no plano”, “(...) configurada para girar y entrar en contacto con el reborde no plano para sellar la tapa al reborde”, en la reivindicación 33, “(...) el por lo menos un miembro de sellado superior gira alrededor de un eje de rotación alternante para sellar la tapa al reborde”, en la reivindicación 34, “(...) cada uno configurado para girar alrededor de un eje de rotación alternante para sellar la tapa al reborde”, en la reivindicación 35, “(...) el por lo menos un miembro de sellado superior incluye un primer miembro de sellado

1 Proceso 129-IP-2007

superior configurado para sellar una porción de la tapa a una porción del reborde y un segundo miembro de sellado superior configurado para sellar otra porción de la tapa a otra porción del reborde”, en la reivindicación 36, “(...) y se configura para girar alrededor de un eje de rotación y entrar en contacto con las superficies de soporte de los asientos para sellar la tapa al empaque”, en la reivindicación 37, “(...) configurada para avanzar el empaque”, “(...) configuradas para soportar el reborde no plano”, “(...) configurada para girar y presionar la tapa contra el reborde”, en la reivindicación 38, “(...) configura para girar alrededor de un eje de rotación y entrar en contacto con las superficies de soporte de los asientos para sellar la tapa al empaque”, en la reivindicación 39, “(...) además comprende un dispositivo configurado para transferir la tapa desde una fuente de suministro y aplicar la tapa sobre el reborde del empaque”, en la reivindicación 42, “(...) configurada para elevar y mover el empaque”, en la reivindicación 43, corresponden a características funcionales, las cuales aunque explican la relación que hay entre diversas características estructurales y pueden estar incluidas en las reivindicaciones, no definen la invención; de tal manera no se tienen en cuenta para el estudio de patentabilidad.

Las expresiones: “por lo menos”, en las reivindicaciones 1, 2, 3, 8, 9, 33, 34, 38, 40, 41, “pluralidad”, en las reivindicaciones 16, 33, 37, 38, son imprecisas, por lo cual no permiten distinguir la invención del estado de la técnica. Se sugiere sustituirlas por un término preciso o un rango concreto.

Se sugiere modificar los términos “utilizado”, “utilizando”, “utilizar”, en las reivindicaciones 3, 14, 16, 27, toda vez que pueden interpretarse como usos de la materia patentada los cuales no son válidos debido a que según versa el Art 14 de la D486, los usos no son permitidos.

Se sugiere al solicitante incluir entre paréntesis () los números de referencia de cada uno de los elementos que hacen parte de la invención de acuerdo con la numeración empleada en los dibujos, tanto en el capítulo reivindicatorio como descriptivo, los cuales deben ser coincidentes. Lo anterior, con el fin de hacer más fácil la comprensión de la materia reivindicada.

5. Determinación del Estado de la Técnica

El estado de la técnica se determinó con base en la fecha de presentación de la solicitud de patente nacional: 07 de marzo de 2012, y se encontró el siguiente documento que anticipa el objeto de esta solicitud:

Ítem	Documento	Título	Fecha de Publicación
D1	US 2010/107558	“Device for the roll-sealing of sheets”	06/mayo/2010

El documento D1⁽²⁾ divulga un dispositivo para el sellado rodante de hojas que comprende un rollo de acoplamiento y un rollo sellado, que presiona contra el rodillo de acoplamiento con una fuerza de sellado, de modo que una hoja moldeada y una hoja de cubierta pueden ser guiadas entre el rodillo de sellado y el rollo de acoplamiento y selladas para formar una estructura de hoja de material compuesto sellado. La superficie del rodillo de acoplamiento tiene rebajes para recibir bolsas de burbujas de la lámina moldeada y una estructura ondulada. Las elevaciones formadas por la estructura ondulada comprenden áreas de contacto de diferentes tamaños. (Resumen).

2 http://gb.espacenet.com/search97cgi/s97_cgi.exe?Action=FormGen&Template=gb/en/advanced.htm

6. Examen de Patentabilidad (Art 14 D486)

Es importante mencionar que el siguiente análisis de patentabilidad se realizó teniendo en cuenta las objeciones del numeral 4 de la presente comunicación.

Novedad (Art 16 D486)

La reivindicación 1 consiste en *“Un método para sellar un empaque que contiene un producto alimenticio, el método caracterizado porque comprende: aplicar una tapa a...”* (Ver página 40 del radicado N° 14-188339-00000-0000).

Comparación de las características técnicas esenciales, con las del estado de la técnica:

Características técnicas esenciales	D1: US 2010/107558
Un método para sellar un empaque que contiene un producto alimenticio, el método caracterizado porque comprende:	Un proceso de sellado por rolado de alta calidad mediante un dispositivo de sellado de hojas por rolado (Pág. 3, Párr. 0038; Fig. 1) caracterizado porque comprende:
- Aplicar una tapa a un reborde no plano que rodea una periferia del empaque	La hoja de moldeado (3) y la lámina de cubierta (4) se transportan al rodillo de acoplamiento (2) y al rodillo sellado (1) desde diferentes direcciones. Debido a que se calienta mediante un calentador (no se muestra), el rodillo sellado (1) comprende una temperatura más alta que el rodillo de acoplamiento (2) y se presiona contra dicho rodillo de acoplamiento por la fuerza de sellado (F). La hoja de cubierta (4) es presionada sobre la hoja de moldeado (3) en el punto de contacto entre los dos rodillos y se une a ella, en un proceso que se conoce como "sellado". El rodillo de acoplamiento (2) comprende cavidades (7) en su superficie circunferencial, en el que los bolsillos del blíster (9) de la hoja de moldeo (3) encajan durante el proceso de sellado (Pág. 2, Párr. 0026; Fig. 1).
- Soportar una porción del reborde no plano	
- Progresivamente sellar la tapa a la porción soportada del reborde no plano al aplicar presión en uno o más puntos tangentes contra la tapa y el reborde utilizando un miembro de sellado.	

De acuerdo con la tabla anterior, las características esenciales del método para sellar un empaque de la reivindicación 1 habían sido divulgadas previamente en el documento D1, por lo tanto, la materia reivindicada no es nueva.

En consecuencia, la reivindicación 1 carece de novedad, según lo divulgado en el documento D1.

Asimismo, el documento D1 divulga las características de las reivindicaciones dependientes así:

- Reivindicación 2: La hoja de cubierta (4) es presionada sobre la hoja de moldeado (3) en el punto de contacto entre los dos rodillos y se une a ella, en un proceso que se conoce como "sellado" (Pág. 2, Párr. 0026; Fig. 1).
- Reivindicación 3: La hoja de moldeado (3) y la lámina de cubierta (4) se transportan al rodillo de acoplamiento (2) y al rodillo sellado (1) desde diferentes direcciones. Debido a que se calienta mediante un calentador (no se muestra), el rodillo sellado (1) comprende una temperatura más alta que el rodillo de acoplamiento (2) y se presiona contra dicho rodillo de acoplamiento por la fuerza de sellado (F) (Pág. 2, Párr. 0026; Fig. 1). El eje de rotación del rodillo de acoplamiento (donde se apoya la hoja de moldeado) es paralelo al rodillo de

sellado.

- Reivindicación 4: la hoja de moldeado (4) se transporta al rodillo de acoplamiento (2), donde la dirección de avance de dicha hoja es perpendicular al eje de rotación del rodillo de presión (1) (Figs. 1 y 2).
- Reivindicación 6: se define una zona en la que la presión del rodillo de sellado caliente (1) presiona la hoja de cubierta (4) y la hoja de moldeo (3) contra el rodillo de acoplamiento (2) y así une dichas hojas (Pág. 2, Párr. 0027; Fig. 2). Dicha zona de presión define dos planos, el primero donde comienza el sellado y el segundo donde finaliza el sellado de cada blíster (9), dichos planos son tangentes al rodillo de sellado en los dos instantes de sellado descritos (Fig. 2).
- Reivindicación 7: la hoja de moldeo (3) con bolsillos de blíster (9) formadas en la misma se mueve en la dirección de transporte mientras recae en el rodillo de acoplamiento (9) (Pág. 3, Párr. 0028; Fig. 1).
- Reivindicación 16: La hoja de moldeado (3) y la lámina de cubierta (4) se transportan al rodillo de acoplamiento (2) y al rodillo sellado (1) desde diferentes direcciones. Los rollos que suministran las hojas de moldeado (3) y cubierta (4) no se muestran (Pág. 2, Párr. 0026; Fig. 1).
- Reivindicación 17: La hoja de moldeado (3) y la lámina de cubierta (4) se transportan al rodillo de acoplamiento (2) y al rodillo sellado (1) desde diferentes direcciones. Debido a que se calienta mediante un calentador (no se muestra), el rodillo sellado (1) comprende una temperatura más alta que el rodillo de acoplamiento (2) y se presiona contra dicho rodillo de acoplamiento por la fuerza de sellado (F) (Pág. 2, Párr. 0026; Fig. 1). El lugar donde se hace el sellamiento se considera una estación de sellado (Fig. 1).

La reivindicación 33 consiste en “*Un aparato para sellar una tapa a un reborde no plano que rodea una periferia de un empaque que...*” (Ver página 45 del radicado N° 14-188339-00000-0000).

Comparación de las características técnicas esenciales, con las del estado de la técnica:

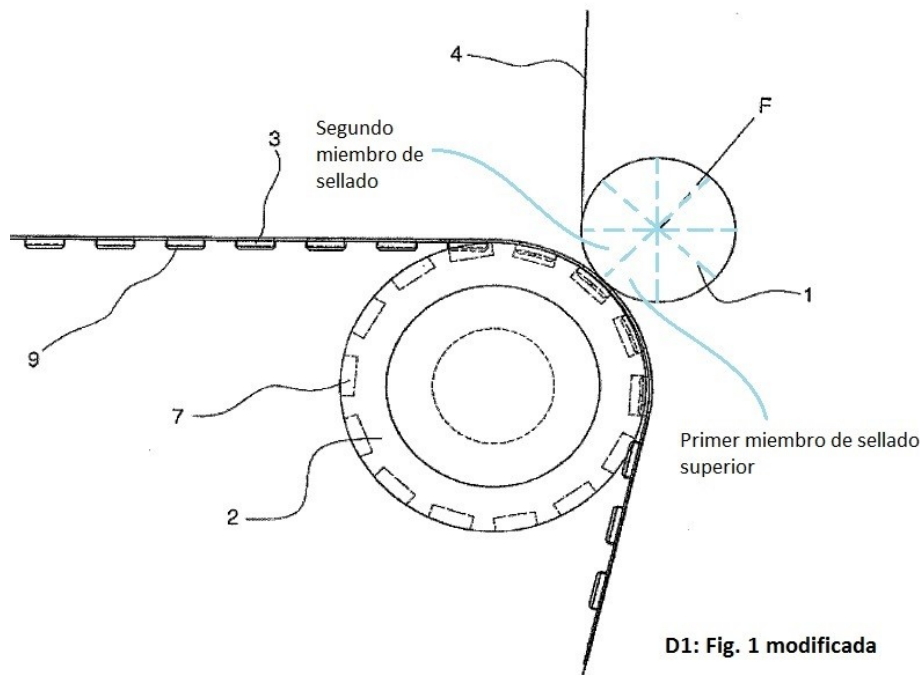
Características técnicas esenciales	D1: US 2010/107558
Un aparato para sellar una tapa a un reborde no plano que rodea una periferia de un empaque que contiene un producto alimenticio, el aparato caracterizado porque comprende:	Un dispositivo para sellamiento por rolado de una lámina de cubierta (4) a una reborde no plano que rodea una periferia que contiene un producto (Pág. 3, Párr. 0026; Figs. 1 y 2), el aparato caracterizado porque comprende:
- Una superficie transportadora	La hoja de moldeo (3) con bolsillos de blíster (9) formadas en la misma se mueve en la dirección de transporte mientras recae en el rodillo de acoplamiento (9) (Pág. 3, Párr. 0028; Fig. 1).
- Un molde giratorio inferior que sobresale en parte por encima de la superficie transportadora y que tiene una pluralidad de asientos.	El dispositivo que comprende un rodillo de acoplamiento (2). El rodillo de acoplamiento (2) comprende cavidades (7) en su superficie circunferencial, en la que bolsas del blíster (9) de la hoja de moldeado (3) encajan durante el proceso de sellado (Pág. 3, Párr. 0026; Figs. 1 y 2).
- Cada asiento tiene una pluralidad de superficies de soporte.	Las cavidades (7) tiene superficies de soporte para las bolsas de blíster (9) (Pág. 2, Párr. 0027; Fig. 8).
- Un miembro de sellado superior que tiene una superficie de sellado	La zona de contacto es el área donde la presión del rodillo de sellado calentado presiona la hoja de cubierta (4) y la hoja de moldeo (3) contra el rodillo de acoplamiento y así unir dichas hojas (Pág. 2, Párr. 0027; Fig. 2).

De acuerdo con la tabla anterior, las características esenciales del aparato para sellar una tapa a un reborde no plano de la reivindicación 33 habían sido divulgadas previamente en el documento D1, por lo tanto, la materia reivindicada no es nueva.

En consecuencia, la reivindicación 33 carece de novedad, según lo divulgado en el documento D1.

Asimismo, el documento D1 divulga las características de las reivindicaciones dependientes así:

- Reivindicación 35: el rodillo de sellado (1) comprende miembros superiores de sellado (Ver Fig. 1 modificada).



- Reivindicación 37: el rodillo de sellado (1) comprende una pluralidad de superficies de sellado (Ver Fig. 1 modificada).

La reivindicación 38 consiste en “Un aparato para sellar una tapa a un reborde no plano que rodea una periferia de un empaque que...” (Ver página 46 del radicado N° 14-188339-00000-0000).

Comparación de las características técnicas esenciales, con las del estado de la técnica:

Características técnicas esenciales	D1: US 2010/107558
Un aparato para sellar una tapa a un reborde no plano que rodea una periferia de un empaque que contiene un producto alimenticio, el aparato caracterizado porque comprende:	Un dispositivo para sellamiento por rolado de una lámina de cubierta (4) a una reborde no plano que rodea una periferia que contiene un producto (Pág. 3, Párr. 0026; Figs. 1 y 2), el aparato caracterizado porque comprende:
- Un transportador.	Un rodillo de acoplamiento (2) (Pág. 2, Párr. 0026; Fig. 1)

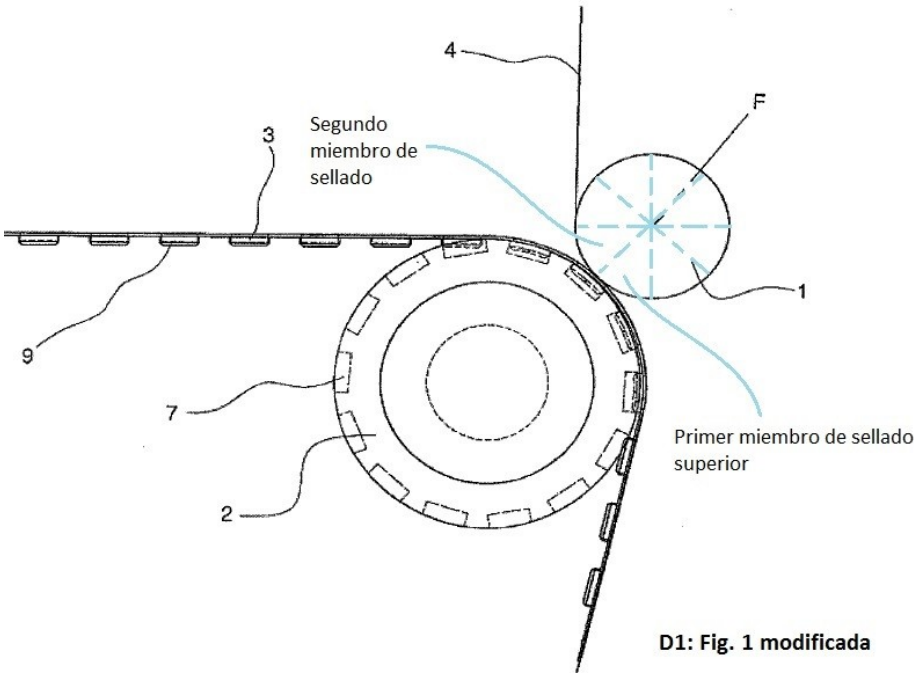
- El transportador incluye una pluralidad de asientos formados sobre el mismo.	El rodillo de acoplamiento (2) comprende cavidades (7) en su superficie circunferencial, en la que bolsas del blíster (9) de la hoja de moldeado (3) encajan durante el proceso de sellado (Pág. 3, Párr. 0026; Figs. 1 y 2).
- Cada asiento tiene una pluralidad de superficies de soporte.	Las cavidades (7) tiene superficies de soporte para las bolsas de blíster (9) (Pág. 2, Párr. 0027; Fig. 8).
- Un miembro de sellado superior que tiene una superficie de sellado	La zona de contacto es el área donde la presión del rodillo de sellado calentado presiona la hoja de cubierta (4) y la hoja de moldeo (3) contra el rodillo de acoplamiento y así unir dichas hojas (Pág. 2, Párr. 0027; Fig. 2).

De acuerdo con la tabla anterior, las características esenciales del aparato para sellar una tapa a un reborde no plano de la reivindicación 38 habían sido divulgadas previamente en el documento D1, por lo tanto, la materia reivindicada no es nueva.

En consecuencia, la reivindicación 38 carece de novedad, según lo divulgado en el documento D1.

Asimismo, el documento D1 divulga las características de las reivindicaciones dependientes así:

- Reivindicación 39: el rodillo de sellado (1) comprende una pluralidad de superficies de sellado (Ver Fig. 1 modificada).



- Reivindicación 40: el rodillo sellado (1) comprende su propia estructura ondulada, en la que las superficies planas de las elevaciones de la estructura ondulada presionan contra la lámina de cubierta y penetran en ella por la profundidad de penetración S1 (Pág. 2, Párr. 0031; Figs. 5 y 6).

7. Conclusión

Los requisitos de patentabilidad de la presente solicitud están afectados de acuerdo a las objeciones de los numerales 4 y 6 así:

Ítem	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	US 2010/107558	1 a 4, 6, 7, 16, 17, 33, 35, 37 a 40	Novedad/Nivel Inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta (60) días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Si como respuesta a este requerimiento el solicitante llegara a modificar: i) el capítulo reivindicatorio, ii) la descripción de la invención a proteger, iii) o presente un nuevo capítulo reivindicatorio, y desee que se realice un nuevo examen de patentabilidad a esta modificación, no deberá pagar la tasa de modificación voluntaria pero sí la correspondiente a la tasa de examen de patentabilidad. En todo caso, el número de requerimientos por no patentabilidad estará supeditado a que el término del estudio de patentabilidad no sea superior a 18 meses, contados desde la publicación de la solicitud de patente de invención. Adicionalmente, se le recuerda al solicitante que si como respuesta a este requerimiento llegara a modificar el capítulo reivindicatorio y éste contenga más de diez (10) reivindicaciones deberá pagar la tasa por reivindicación adicional.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única No. 10 de 2001.



JOSÉ LUIS SALAZAR LÓPEZ
Director de Nuevas Creaciones (c)

El anterior requerimiento fue notificado por fijación en lista, de fecha 2016-04-26

Elaboró: Diego Alberto Cardenas Gonzalez

Revisó: Sonia Andrea Diaz Pirazan

Diego Cardenas

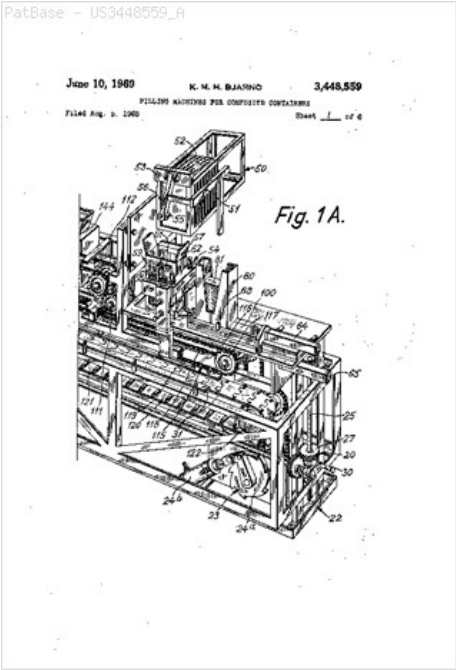
Search history

Search 1: PD<20120306 and IC=(B65B OR B65D OR B29C) (Results 100000)
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Search 3: 1 and 2 (Results 28057)
Search 4: 3 and (seal* and member) (Results 8647)
Search 5: 4 and (lid OR top) (Results 3956)
Search 6: 5 and conveyor (Results 545)
Search 7: 6 and (non planar flange) (Results 0)
Search 8: 6 and (curve* flange*) (Results 0)
Search 9: 6 and (curve* and flange*) (Results 33)

Title: FILLING MACHINES FOR COMPOSITE CONTAINERS

Abstract: Source: US3448559A ABSTRACT OF THE DISCLOSURE
A sequentially operated filling machine for processing collapsed composite containers having an interior bag 15 with a closed bottom and open top supported by relative-ly stiff external side walls and top and bottom flaps; said machine opening the Hat bags, reinforcing the bottom flaps of the composite container to enable the container to stand upright, filling and subsequently sealing the open 20 bag and thereafter closing the top flaps of the composite Container.

Classifications:
International (IPC 8-9): B65B43/26 B65D30/00 B65D33/02 (Advanced/Invention); B65B43/26 B65D30/00 B65D33/02 (Core/Invention)
International (IPC 1-7): B65B1/02 B65B3/02 B65B43/00 B65B43/26 B65B43/30 B65B5/02 B65B7/18 B65D33/02 B65D5/24 B65D5/56 B65D5/60
CPC: B65B43/26 B65D33/02 B65D31/00
European: B65B43/26 B65D31/00 B65D33/02
US: 229/117.27 383/104 383/119 383/90 493/217 53/170 53/376.7 53/571



Family:

Publication number	Publication date	Application number	Application date
AT283210 B	19700727	AT19650007331	19650809
CH429568 A	19670131	CH19620013846	19621126
CH458178 A	19680615	CH19650011141	19650809
CH464062 A	19681015	CH19650011142	19650809
DE1411617 A1	19690313	DE19621411617	19621114
DE1461805 A1	19700409	DE19651461805	19650809
DE1486251 A1	19690123	DE19651486251	19650807
DK108480 C	19671218	DK19610004840	19611205
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GB1024241 A	19660330	GB19620043681	19621119
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SE325509 B	19700629	SE19650010409	19650309
US3272423 A	19660913	US19650478196	19650809
US3448559 A	19690610	US19650478397	19650809

Priority:
DK19610004840 19611205 GB19640032492 19640810

Probable Assignee: BUSER AG MASCHF FRITZ

Assignee(s): (std): BJARNO DIPL ING KNUD ; BJARNO K ; BJARNO KNUD DIPL ING ; BJARNOE K ; BJARNOE KNUD ; BUSER AG MASCHF FRITZ ; BUSER F AG ; BUSER MASCHF FRITZ AG ; KNUD BJARNO ; FRITZ BUSER AG ; HENRIK BJARNO KNUD MARO ; FRITZ BUSER AG MASCHINENFAB

Assignee(s): KNUD BJARNOE ; FRITZ BUSER MASCHF AG ; FRITZ BUSER A G ; FRITZ BUSER AG MASCHINENFABRIK

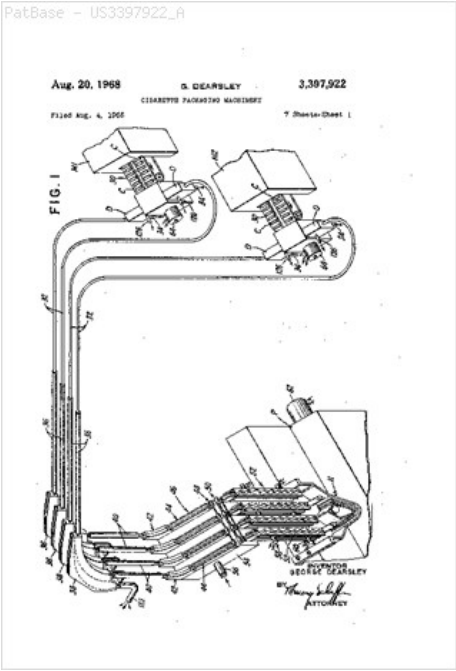
Inventor(s): (std): BJARNO KNUD DIPL ING ; BJARNO KNUD MARO HENRIK ; BJARNOE KNUD ; CIVILINGENIOER KNUD BJARNOE ; KNUD BJARNO ; KNUD BJARNO DIPL ING ; HENRIK BJARNO KNUD MARO ; BJARNOE K ; BJARNO KNUD ; BJARNO K

Inventor(s): KNUD BJARNOE ; KNUD BJARNOE CIVILINGENIOER ; KNUD MARO HENRIK BJARNO

Title: Cigarette packaging machinery

Abstract: Source: GB1155952A 1,155,952. Pneumatic conveyers; shoots. AMERICAN MACHINE and FOUNDRY CO. 28 July, 1966 11 Aug., 1965], No. 34341/65. Headings B8A and B8S. In apparatus for conveying cigarettes from making machines M1, M2 to a packaging machine P, the cigarettes C pass to opposed pairs of dispensers D which feed them one by one into pneumatic pipe-lines 32 leading to vented arcuate guides 38, vertical pipes 40 and flotation guide channels 44 from which they are removed by rollers 48, 50 and fed to serpentine shoots 52 leading to the hopper H of the packaging machine. Dispensers D.-The cigarettes are fed transversely on to a pair of horizontal rollers 72, Fig. 2, which oscillate rotationally in opposite directions to feed the cigarettes one by one into a trough 110 from which they are conveyed longitudinally, by a suction roller 122, between a pair of soft endless belts 128 which form an air seal around the cigarettes. The belts 128 feed the cigarettes through a chamber L to the inlet 162 of the conveyer pipe 32 through which they are propelled by compressed air supplied at 34. Guides 38.-The arcuate guides for decelerating the cigarettes each comprise a pair of opposed spaced tracks 164, Fig. 8, having guide surfaces 170, 172 the angles of which are selected according to the degree of wedging effect required. Flotation conveyer 46.-Each guide channel 44 of the conveyer is mounted on an air tank 54 and comprises vertical side walls 196, Fig. 15, and a base member 194 formed with a V-section groove 200. Spaced vertical holes 204 in the base member communicate with holes 206 in the tank 54 and air deflector plates 208 are provided adjacent each hole 204 to deflect the air stream in a longitudinal direction. Metering rollers at the end of each channel 44 discharge the cigarettes into the serpentine shoots 52. Serpentine shoots 52.-Each shoot 52 comprises three parallel plates, each formed with a serpentine channel, Fig. 1, arranged to maintain the cigarettes horizontal. Upper and lower photo-electric cell devices 58, 60 are provided to cut off the drive of the dispenser D when cigarettes accumulate in the shoots and to cut off the drive to the packaging machine when the reservoir of cigarettes in the shoot reaches the lower level respectively.

Classifications:
International (IPC 8-9): A24C5/35 B65B19/04 (Advanced/Invention); A24C5/00 B65B19/00 (Core/Invention)
International (IPC 1-7): B65B19/04 B65G11/20 B65G51/02
CPC: A24C5/35 B65B19/04
European: A24C5/35 B65B19/04
US: 406/127 406/154 406/70 406/79



Family:

Publication number	Publication date	Application number	Application date
DE1481026 A1	19700115	DE19661481026	19660810
FR1493782 A	19670901	FR19660072048	19660804
GB1155952 A	19690625	GB19650034341	19650811
US3397922 A	19680820	US19660574882	19660804

Priority:
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Probable Assignee: AMERICAN MACH AND FOUNDRY

Assignee(s): (std): AMERICAN MACH AND FOUNDRY

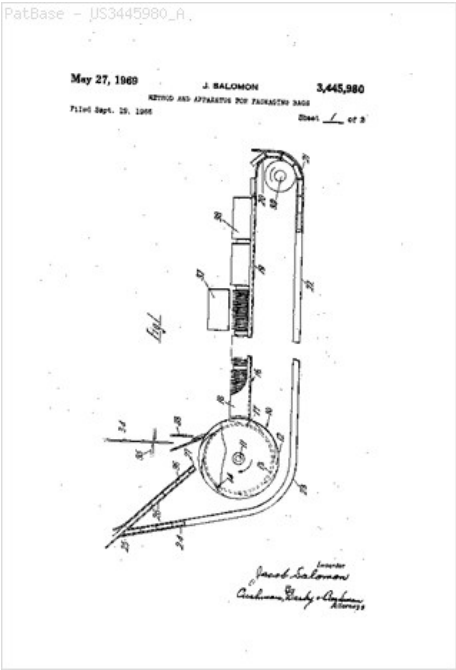
Assignee(s): AMERICAN MACHINE AND FOUNDRY COMPANY

Inventor(s): (std): DEARSLEY GEORGE ; GEORGE DEARSLEY

Title: METHOD AND APPARATUS FOR PACKAGING BAGS

Abstract: Source: US3445980A ABSTRACT OF THE DISCLOSURE
The invention provides a method of packaging bags and apparatus therefor, in which fiat bags and spacer elements are fed to the pockets of a star wheel compris- 15 ing a rim, a pair of spaced flanges and a plurality of wings which are readwardly inclined with respect to the direction of rotation of the wheel. The bags and spacers are extracted from the pockets and placed on a radially extending guide where packages are formed each com- 20 prising a group of bags delimited by successive spacers. The spacer elements may proceed to the far end of the guide and be returned for reuse or may be included to form ends of individual packages.

Classifications:
International (IPC 8-9): B65B35/30 B65B35/46 B65B5/06 (Advanced/Invention); B65B35/30 B65B5/06 (Core/Invention)
International (IPC 1-7): B65B35/26 B65B35/30 B65B35/46 B65B5/06
CPC: B65B5/061 B65B35/30 B65B35/46
European: B65B35/30 B65B35/46 B65B5/06B
US: 414/798.5 53/260 53/448 53/542



Family:

Publication number	Publication date	Application number	Application date
CH459047 A	19680630	CH19660013537	19660920
DE1511771 B1	19700820	DE19661511771	19660915
GB1097842 A	19680103	GB19650040243	19650921
IL26531 A1	19700819	IL19660026531	19660919
US3445980 A	19690527	US19660580279	19660919

Priority:

GB19650040243 19650921

Probable Assignee: SALOMON J

Assignee(s): (std): SALOMON J ; SALOMON JACOB

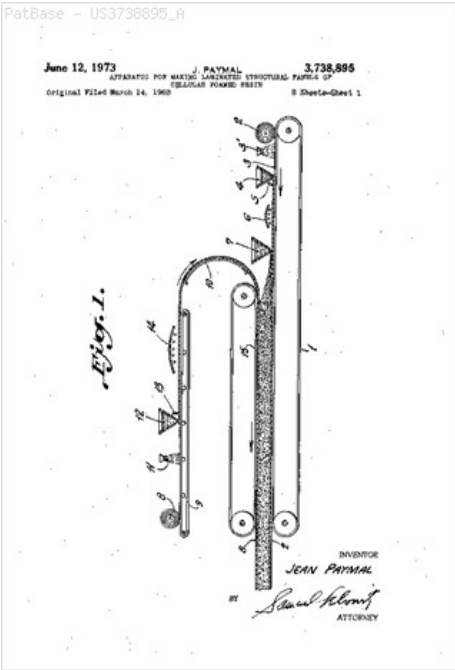
Assignee(s): JACOB SALOMON

Inventor(s): (std): JACOB SALOMON ; SALOMON JACOB

Title: APPARATUS FOR MAKING LAMINATED STRUCTURAL PANELS OF CELLULAR FOAMED RESIN

Abstract: Source: US3738895A ABSTRACT OF THE DISCLOSURE
The production of laminated structural panels, particularly for buildings, composed of a cellular core of foamed resin with facing layers of a hardenable resin, with or without reinforcement, which are assembled in such ways that the foaming of the core resin occurs simultaneously with the hardening of the resin of the facing layers so that the assembly is integrated effectively, giving rise to no faulty joints or deleterious stresses, and thereby imparting maximum strength characteristics to the panels. This is a divisional of application Ser. No. 713,153, filed Mar. 14, 1968, now abandoned.

Classifications:
International (IPC 8-9): B28B1/00 B29C44/30 B29C44/32 B29C70/00 B29C70/50 B29C70/52 B32B17/06 B32B27/00 B32B37/00 E04C2/20 E04C2/24 E04C2/26 E04C2/34 E04C2/38 F16S1/00 (Advanced/Invention); B29C44/00 B29C70/00 B29C70/04 B32B17/06 B32B27/00 B32B37/00 E04C2/10 E04C2/26 E04C2/34 E04C2/38 F16S1/00 (Core/Invention)
International (IPC 1-7): B29C15/00 B29C27/14 B29D27/00 B29D3/00 B29D3/02 B29D9/00 B29G7/02 B31F1/00 B32B5/18 B32B5/20 E04C2/20 E04C2/38
CPC: B29C44/32 Y10T156/103 B29C44/308 B29C44/30 B29C67/2255 B29C70/00 B29C70/508 B29C2043/483 B29K2063/00 B29K2067/06 B29K2075/00 B29K2105/04 B29K2105/0845 B29K2105/0854 B29K2309/08 B29L2007/00 B29L2009/00 B32B17/06 B32B27/00 E04C2/205 E04C2/38
European: B29C44/30 B29C44/30E B29C44/32 B29C67/22C10B B29C70/00 B29C70/50B4 B32B17/06 B32B27/00 E04C2/20B E04C2/38 L29C43/48A L29K105/04 L29K105/08B8 L29K105/08C L29K309/08 L29K63/00 L29K67/06 L29K75/00 L29L7/00 L29L9/00
US: 156/213 156/44.3 156/443 156/500 156/62.2 156/79 264/45.3 264/46.2 425/4C 425/4R



Family:

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DE1930487 A1	19700924	DE19691930487	19690616
ES351884 A1	19690616	ES19680351884	19680322
FR1523411 A	19680503	FR19670099785	19670322
FR94121 E	19690704	FR19670131728	19671211
FR94327 E	19690801	FR19670134050	19671228
FR95186 E	19700731	FR19680156019	19680621
GB1224028 A	19710303	GB19680013459	19680320
GB1224211 A	19710303	GB19680014759	19680327
GB1225524 A	19710317		00000000
LU55731 A	19681129		00000000
NL158431 B	19781115	NL19680004078	19680322
NL160516 B	19790615	NL19680004079	19680322
NL6804077 A	19680923	NL19680004077	19680322
NL6804078 A	19690613	NL19680004078	19680322
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US3738895 A	19730612		00000000

Priority:
FR19670099785 19670322 FR19670131728 19671211 FR19680156019 19680621
FR19670134050 19671228

Probable Assignee: SAINT GOBAIN
Assignee(s): (std): CIE DE SAINTGOBAIN ; CO SAINT GOBAIN ; SAINT GOBAIN ; CIE DE SAINT GABAIN S A
Assignee(s): CIE DE SAINT GOBAIN FR ; SAINT GOBAIN INDUSTRIES ; COMPAGNIE DE SAINTGOBAIN ; COMPAGNIE DE SAINT GABAIN S A ; COMPAGNIE DE SAINT GOBAIN SOCIETE ANONYME NEUILLY SUR SEINE FRANKRIJK ; DE SAINT GOBAIN COMP ; SAINT GOBAIN IND ; CO SAINT GOBAIN FR ; COMPAGNIE DE SAINT GOBAIN
Inventor(s): (std): PAYMAL J ; PAYMAL JEAN
Inventor(s): PAYMAL J FR

Title: QUILTING APPARATUS

Abstract: Source: US3500777A ABSTRACT OF THE DISCLOSURE
B

Classifications:

International (IPC 8-9): B21J15/02 B21J15/04 B21J15/36 B23D21/00 B23D21/06 B23D21/14 B23D29/02 B23D31/00 B23D33/12 B23D47/04 B23P11/02 B23P9/02 B24B19/00 B24B27/06 B25B7/02 B26F3/00 D05B11/00 F16B19/00 F16B19/02 F16B19/10 F16B29/00 F16B33/00 F16B33/06 F16B35/04 F16B37/12 F16B4/00 F16B5/02 (Advanced/Invention);
F16B19/10 (Advanced/Non-invention);
B21J15/00 B23D21/00 B23D29/00 B23D31/00 B23D33/00 B23D47/00 B23P11/02 B23P9/00 B24B19/00 B24B27/06 B25B7/00 B26F3/00 D05B11/00 F16B19/00 F16B19/02 F16B29/00 F16B33/00 F16B35/04 F16B37/00 F16B4/00 F16B5/02 (Core/Invention);
F16B19/04 (Core/Non-invention)

International (IPC 1-7): B21C37/30 B21D31/00 B21D39/00 B21D41/02 B21J13/02 B21J15/04 B21K21/16 B21K27/06 B23D21/06 B23D29/02 B23D33/12 B23D47/04 B23P11/02 B23P17/00 B23P25/00 B23P3/00 B24B19/00 B24B27/06 B25B7/02 B26B7/00 B26D3/16 B26F3/00 B64C1/12 B65D59/00 B65H17/28 C23F13/00 D05B11/00 D05C9/00 F16B13/00 F16B19/02 F16B19/05 F16B19/10 F16B29/00 F16B43/00 F16B5/00 F16B5/02 F16B5/04 F16B9/02 G01B5/02

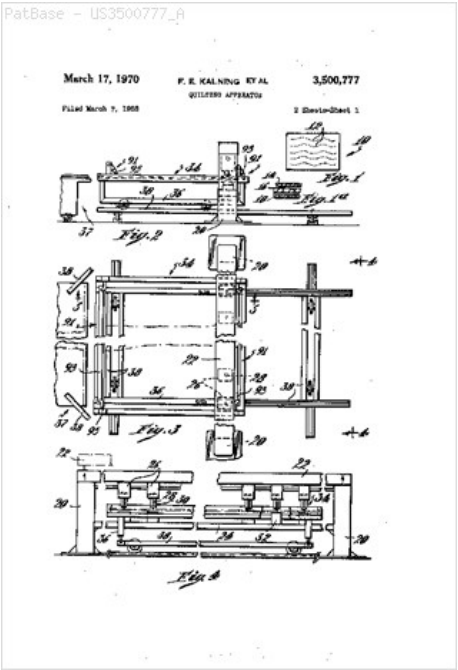
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US: 112/118 225/1 225/103 225/106 225/2 225/93 225/93.5 225/96.5 225/965 248/909 285/382.4 285/4 29/41.2 29/412 29/418 29/428 29/433 29/446 29/451 29/458 29/509 29/523 29/525 29/525.02 29/525.05 29/4180 30/124 30/92 33/174R 33/501 403/12 403/2 403/243 403/281 403/282 403/285 403/372 403/388 403/408.1 411/176 411/178 411/190 411/260 411/368 411/429 411/501 411/542 411/69 411/82 411/929 411/931 411/937.2 411/965 411/969 470/84 52/75.8D 52/758D 52/758F 52/98 72/32.4 72/324 72/338 72/340 72/37. 72/370 72/370.06 72/370.07 72/391.4 72/393 81/13 81/421 81/426 83/178

Family:

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AU197128031 A1	19721026	AU19710028031	19710422
AU197357656 A1	19750109	AU19730057656	19730703
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DE2120059 A1	19711111	DE19712120059	19710423
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DE6909272 U	19731004	DE19690009272U	19690307
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SE368607 B	19740708	SE19710005461	19710428
US3500777 A	19700317	US19680711386	19680307
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US3803895 A	19740416	US19720274613	19720724
US3805578 A	19740423	US19730324484	19730117
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US3835688 A	19740917	US19730324485	19730117
US3868189 A	19750225	US19730322799	19730111
US3871563 A	19750318	US19730378445	19730712
US3875649 A	19750408	US19740489588	19740718
US3879980 A	19750429	US19740462817	19740422



US3908879 A	19750930	US19740458217	19740405	
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US3943748 A	19760316	US19740489253	19740717	
US3949535 A	19760413	US19740501487	19740829	
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Priority:

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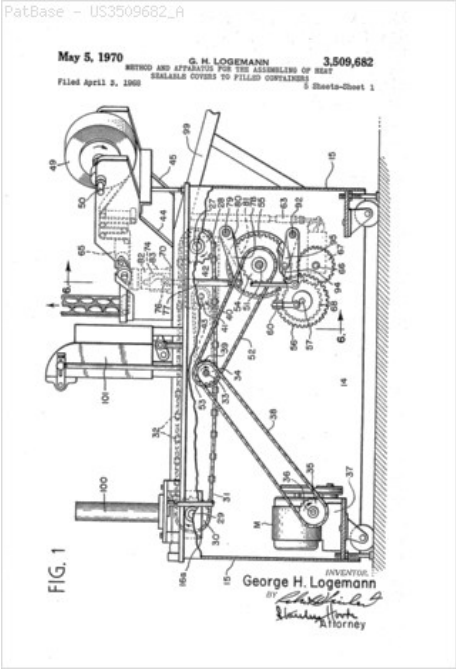
Probable Assignee: KING JOHN O JUN

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Title: METHOD AND APPARATUS FOR THE ASSEMBLING OF HEAT SEALABLE COVERS TO FILLED CONTAINERS

Abstract: Source: US3509682A ABSTRACT OF THE DISCLOSURE
This disclosure relates to a packaging apparatus where-in foil laminated paper cover stock is fed from coil stock to a blanking die assembly mounted at a horizontal angle 15 from the upper limits of said side wall 12 which defines of 32 degrees to the line of travel of a two lane conveyor a jip with which the film surface of the cover 10 has which carries containers through the filler station to the sealed engagement. closure station in straight line intermittent motion. The The machine includes a box-like housing having a pair blanking die blanks 2 covers at a time from the cover stock of opposed upright side walls 14 joined in spaced apart and a transfer head rotates to withdraw the covers from the 20 parallel relation by upright end walls 15. The housing blanking die assembly and to positively place and seal the covers simultaneously while the head has straight line vertical motion in the direction of the containers. Application of heat for sealing the cover is confined to the rim of the container. supports a pair of like frame members 16 in horizontally aligned spaced apart relation so as to expose a guideway between said frame members extending lengthwise of the housing side walls 14. As shown in Fig. 3, the guideway 25 includes a guide rail 17 mounted centrally of and parallel to the frame members 16 via overhead supporting brackets 18 spanning the distance between and secured to members 16 to which the guide rail 17 is adjustably secured and a pair of outer guide rails 19 and 20 likewise adjustably se-

Classifications:
International (IPC 8-9): B65B7/01 B65B7/28 (Advanced/Invention); B65B7/00 B65B7/28 (Core/Invention)
International (IPC 1-7): B65B7/28 B67B3/04
CPC: B65B7/01 B65B7/2878
European: B65B7/01 B65B7/28F4
US: 53/298 53/307 53/329.5 53/390 53/478 53/488



Family:

Publication number	Publication date	Application number	Application date
US3509682 A	19700505	US19680718490	19680403

Priority:

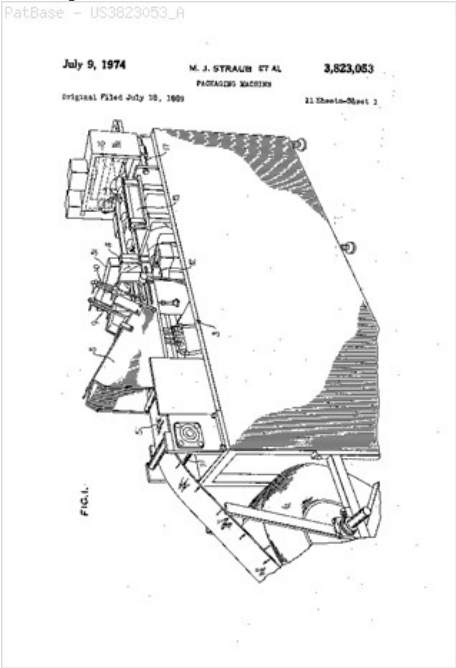
US19680718490 19680403

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Title: PACKAGING MACHINE

Abstract: Source: US3823053A ABSTRACT OF THE DISCLOSURE A packaging machine wherein a web of paperboard is continuously drawn along a defined path, under a loading device by which articles or products to be packaged are successively deposited upon the web to be carried thereby through a curtain or sheet of molten thermoplastic resin which debouches from a downwardly opening nozzle, to lay itself onto and form a covering film on the web and over any articles or products thereon. The mouth of the nozzle is a slit which extends transversely across a vacuum chamber by which any space between the close to the web while its mid-portion is spaced much farther from the web. The film covered web then travels across a vacuum chamber by which any space between the covering film and the web is evacuated and the film drawn tightly over the articles or products and against the web. A series of closely spaced parallel rollers across the top of the vacuum chamber with their axes transverse to the web supports the web, and certain of the rollers are driven to draw the -web through the machine. Beyond the vacuum chamber, the web with the covered articles or products thereon enters a guillotine type cutoff station where it is cut into discrete units each of which is a complete package. This invention, like that of the co-pending application Ser. No. 119,568, filed Mar. 1, 1971, now Pat. No. 3,755,523, of which this is a division, and which in turn was a division of S.N. 842,991, filed July 18, 1969, now Pat. No. 3,596,432, relates to a machine for packaging articles by the so-called "skin packaging" technique. There are two ways in which the skin packaging has been practiced. In one, a thermoplastic sheet-usually transparent-after being heated to soften it, is draped over the article which has been placed upon an air pervious panel, such as a piece of cardboard and then by means of suction applied to the underside of the panel, the thermoplastic sheet is drawn down over the article and into firm engagement with the top of the panel. To assure good adhesion between the panel and those portions of the thermoplastic sheet in contact therewith, it is customary to coat the panel surface or selected areas thereof with a coating -which has an affinity for the material of which the thermoplastic sheet is made. The Groth Pat. No. 2,855,735 and the Grinrod et al. Pat. No. 3,228,168 are examples of this skin packaging method. The other approach to skin packaging is an outgrowth of curtain enrobing, wherein articles to be enrobed are carried through a falling 'curtain of the coating or enrobing material. This packaging method is described in an article which appeared in the May 1965 issue of Modern Packaging, under the heading "Skin Pack That Flows On." As explained in that article, the curtain is molten thermoplastic resin extruded from a nozzle and deposited onto the article to be packaged and the surrounding surface of the card on which it is placed. As the flowing thermoplastic material contacts the article and its carrying card, it solidifies and forms the desired covering film; and, again, as in the other method, suction applied to the underside of the card draws the covering film tightly about the article and onto the card. The present invention also uses an extruded molten thermoplastic film and, in a general way, produces packages in the manner described in the Modern Packaging article, but does so far more efficiently. To gain the utmost efficiency and speed, the machine of this invention operates in a continuous manner. To that end, the articles or products to be packaged are sequentially deposited upon a traveling substrate which may be a web of paperboard drawn from a roll, to be carried thereby through the descending curtain or sheet of liquid thermoplastic material and covered by thermoplastic film which forms as the molten material contacts the web and the articles thereon. Directly downstream from the nozzle by which the curtain is formed, the machine has an upwardly opening suction nozzle or vacuum chamber across which the web passes. As it does, any space between the web and the covering thermoplastic film is evacuated, causing the covering film to be drawn tightly over the article and against the web, it being understood that the web is either inherently air permeable or specially made SO. The traveling web with the now covered articles thereon next passes through a cutting station where a "flying guillotine" severs the web into individual packages. In the development of the machine of this invention, it was observed that the phenomenon known as "necking"--which is a convergent narrowing of the width of the curtain debouching from the nozzle, and which in the past was thought to be inescapable--caused the side edges of the ribbon of film laid onto the web to take a very irregular shape. To eliminate this unsightly result, it would be necessary to trim off the side edge portions of the finished packages, which of course would create waste and take time, unless some way of preventing necking could be found. This has been accomplished by the present invention. As will be more fully explained hereinafter, one of the features of this invention stems from the discovery that if the elongated nozzle orifice from which the curtain of molten thermoplastic material issues, is arched or concave in its lengthwise dimension so that the end of the nozzle can be brought close to the side portions of the web while its middle is spaced far enough above the web to accommodate the articles or products being carried through the curtain issuing from the nozzle, the side edges of the applied film are straight and can be held directly contiguous to the edges of the substrate web. But with the solution of the necking problem, another difficulty was encountered. The medial portion of the applied film did not lie flat along the length of the web, even when the web was devoid of articles or products, but instead was doubled or piled up on itself at spaced intervals. This objectionable condition known as "cascading" results from the wavering that is characteristic of a falling sheet or curtain of liquid resin. Because of it, the deposited material folds back and forth upon itself, unless the advance of the surface onto which the curtain is deposited and the velocity of the falling curtain are

Classifications:
International (IPC 8-9): B05B13/02 B05C5/00 B29C47/00 B29C47/14 B65B11/52 B65B33/00 (Advanced/Invention); B05B13/02 B05C5/00 B29C47/00 B29C47/14 B65B11/50 B65B33/00 (Core/Invention)
International (IPC 1-7): B05B13/00 B29C17/04 B29D7/04 B29F3/04 B65B11/00 B65B11/52 B65B33/00 B65B33/02 B65B61/18 B65B9/02
CPC: B29C47/0066 Y10S118/04 B29C47/0042 B29C47/14 B29K2105/04 B65B33/00 B05C5/002 B05C5/005 B29C47/0021 B29C47/0038
European: B05C5/00B B05C5/00E B29C47/14 B65B33/00 L29C47/00J5 L29C47/00L L29C47/00L12 L29C47/00L5 L29K105/04
US: 118/303 118/324 118/DIG.4 156/244.12 156/244.21 156/500 264/177.17 264/259 264/510 264/553 264/554 264/555 425/113 425/376.1 425/388 425/461 425/465 425/466 425/467 425/504 425/511 425/514 425/516 427/420 53/133 53/133.7 53/140



Family:

Publication number	Publication date	Application number	Application date
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DE2033379 A1	19710128	DE19702033379	19700706
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US19690842991 19690718 US19710119568 19710301 US19740433091 19740114
US19720306028 19721110

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Title: AUTOMATED CLINICAL LABORATORY

Abstract: Source: US3635394A An automated centrifuge system having a conveyor for test tubes to be loaded thereon at a first transfer station, the test tubes are removed from the conveyor and placed into trunnion cups on a trunnion carrier. Program means are coupled to the trunnion carrier to first slowly rotate the trunnion carrier as the test tubes are loaded thereon, second, rapidly rotate the trunnion carrier to centrifuge specimens therein and third, slowly rotate the test tubes so that the test tube can be unloaded. The test tubes are then removed from the trunnion carrier and, second conveyor carries the test tubes away from the trunnion carrier.

Classifications:

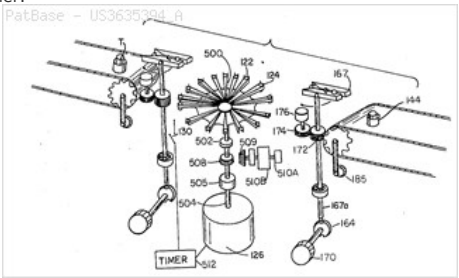
International (IPC 8-9): B01L3/14 B04B5/02 B04B5/04 B04B7/08 B04B9/08 G01N1/38 G01N15/04 G01N21/25 G01N35/02 G01N35/10 (Advanced/Invention); G01N1/28 G01N35/00 G01N35/04 G01N35/10 (Advanced/Non-invention); B04B5/00 B04B7/00 G01N1/38 G01N21/25 G01N35/02 G01N35/10 (Core/Invention); G01N1/28 G01N35/00 G01N35/04 G01N35/10 (Core/Non-invention)

International (IPC 1-7): B01L11/00 B01L3/00 B04B1/00 B04B1/08 B04B11/04 B04B13/00 B04B5/00 B04B5/04 B04B7/00 B04B7/08 B04B9/12 B04B9/14 B65B43/54 B65D25/04 B67D G01J3/50 G01N1/00 G01N1/02 G01N1/14 G01N1/18 G01N1/28 G01N21/02 G01N21/13 G01N21/26 G01N21/75 G01N31/00 G01N33/00 G01N33/16 G01N35/00 G01N35/04 G01N35/06

CPC: B01L3/5021 B04B5/0407 G01N15/042 B04B5/02 B04B7/08 B04B9/08 G01N15/04 G01N35/1083 B04B5/0414 B04B2011/046 G01N1/38 G01N35/02 G01N35/021 G01N35/1004 G01N2001/382 G01N2035/00495 G01N2035/00524 G01N2035/0406 G01N2035/0465 Y10T137/86823 G01N35/026 G01N21/253 G01N35/1065 Y10T137/86501

European: B01L3/14D B01L3/5021 B04B5/02 B04B5/04B B04B5/04B2 B04B7/08 B04B9/08 G01N1/38 G01N15/04 G01N15/04B G01N21/25B2 G01N35/02 G01N35/02B G01N35/02E G01N35/10 G01N35/10T1 L04B11/04D S01N1/28B2 S01N1/38B S01N35/00F2 S01N35/00F4 S01N35/04A2 S01N35/04C2 S01N35/10B S01N35/10M S01N35/10T1

US: 118/52 137/625.11 137/625.41 141/130 198/377.01 23/25.9 23/259 233/2.6 233/26 250/565 356/18. 356/180 356/315 356/316 356/409 356/414 422/100 422/101 422/102 422/510 422/548 422/561 422/65 422/67 422/72 422/89 422/918 494/11 494/16 494/20 494/24 494/31 494/37 494/47 494/7 494/84 73/863.32 73/864.17 73/864.24 73/864.25



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Priority:

US19690845992 19690730	US19690845992 19691107	US19690874824 19691107
US19710156285 19710624	US19700845992 19700819	US19720303500 19721103
US19720253167 19720515	US19700095305 19701204	

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Inventor(s): NATELSON SAMUEL DR CHICAGO ILL V ST A ; NATELSON SAMUEL CHICAGO ILL V S A ; NATELSON S US

Title: METHOD FOR MAKING A STORAGE TANK BY APPLYING CONTINUOUS FILAMENTS TO THE INTERIOR SURFACE OF A ROTATING MOLD

Abstract: Source: US3692601A ABSTRACT OF THE DISCLOSURE A fiberglass reinforced storage tank formed by constructing a filament reinforced cylindrical side wall and enclosing the transverse ends with a pair of end domes. The end domes are prefabricated in a circular mold of proper contour and size. A solvent-dispersed mold release agent is sprayed into the mold over the entire mold surface. Glass filaments are then laid along with a spray, of catalyzed binder resin in the rotating heated mold, beginning at the center and extending to the outer periphery thereof to form the resin cured rigid end domes. The annular cylindrical side wall is formed by applying fiberglass resin to the interior surface of a rotating cylindrical mold in the presence of a catalyzed binder resin with the formed end domes secured to the transverse ends of the mold during side wall formation. A particulate matter such as sand may be added to the composition. The mold is divided into longitudinal arcuate sections which are capable of separating for removal of a finally formed storage tank. DISCLOSURE This invention relates in general to certain new and useful improvements in apparatus and process for making fiberglass reinforced storage tanks. More particularly, the invention relates to an improved method of making fiberglass reinforced storage tanks by initially forming a pair of tank end domes. A cylindrical side wall of the tank is centrifugally cast making the prefabricated end domes for the tank an integral inclusion in the annular side wall. It has long been a common practice to construct underground storage tanks for the containment of liquid fuels such as gasoline, fuel oil, etc. from sheet steel or other heavy metals. It has also been a common practice to coat all exterior surfaces of such tanks with a corrosion preventive film such as bitumastic, filled resins, etc. However, these external coatings when applied to the tanks have not been entirely successful in preventing the encroachment of metal corroding fluids. In addition, the majority of these tanks are not coated on the inner surface which very often leads to corrosion from the interior surface. In order to obviate the problems encountered with metal tanks, many industries such as the petroleum industry have attempted to employ glass reinforced plastic tanks which are resistant to corrosive soil conditions or normally corrosive liquid contents. In addition, reinforced plastic tanks are not subjected to the possible incidental damage from stray electric currents resulting in galvanic attack as is oftentimes the case in steel tanks. In view of the evident advantages of glass reinforced tanks for underground service, many industries have sought suppliers for these tanks. Typically, the presently available reinforced plastic tanks are constructed by standard filament winding techniques to accumulate the cylindrical side wall and the end dome structure. These filament winding techniques are more fully described in U.S. Letters Patent No. 2,731,376. Filament winding techniques are often quite expensive and require a substantial amount of time in order to complete the fabricating of the structure. Another technique of forming the tank side wall resides in the application of glass mat or a combination of filament strands and chopped glass along with glass mat which are directly applied to the surface of a mandrel. However, conventional glass mats and chopped glass do not provide sufficient hoop strength and more importantly do not provide for adequate buckling resistance against external loading. There have been other attempts to cylindrically cast the tank side wall by applying strands, glass mats, or chopped glass, or a combination of these elements to the interior surface of a mold. The glass reinforced material is then resin impregnated and cured in order to form the cylindrical structure. However, in underground tanks where the primary loading is a compressive buckling, (as opposed to hoop tension in the case of the above ground tanks), it is desirable to produce a relatively inexpensive but fairly thick tank wall. The extant techniques result in tanks with high strength hoop tension. Accordingly, the conventional hand lay-up and spraying techniques have severe shortcomings in the fabrication of underground tanks and similar structures. The present invention is, therefore, designed to provide an apparatus and method for producing a thick wall tank section with inexpensive raw materials that are combined in such manner to provide adequate compressive buckling resistance as well as economic feasibility. OBJECTS It is, therefore, the primary object of the present invention to provide a method and apparatus for the production of filament reinforced storage tanks adaptable for use in underground systems. It is another object of the present invention to provide a method and apparatus of the type stated for the manufacturing of fiber reinforced storage tanks by separately forming various components forming part of the storage tank and finally assembling these components into a unitary structure. It is an additional object of the present invention to provide an apparatus for producing fiber reinforced storage tanks on a mass-production basis which eliminates the necessity of employing conventional filament winding techniques and manually directed spray-up. It is another salient object of the present invention to provide an apparatus and method of the type stated which is readily adaptable to produce storage tanks of a wide variety of sizes and shapes. It is a further object of the present invention to provide a method of producing filament reinforced fiberglass storage tanks which enables formation of a tank with all of the necessary physical capabilities and mechanical attributes normally found in filament wound tanks, but which eliminates the undesirable conventional filament winding techniques. It is also an object of the present invention to provide both a method and apparatus of producing filament reinforced fiberglass storage tanks where particulate matter such as sand may be incorporated into the composite for enhancing the structural properties and the overall appearance of the final tank. With the above and other objects in view, our invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims. FigureS In the accompanying drawings (10 sheets): Fig. 1 is a perspective view showing the apparatus for preforming cylindrical end domes which form part of the storage tanks of the present invention; Fig. 2 is a perspective view showing the apparatus for forming the annular cylindrical side wall of the storage tanks of the present invention with the end domes as an inclusion thereof; Fig. 3 is a top plan view of the apparatus of Fig. 1 for constructing the end domes forming part of the filament reinforced tank, and which is constructed in accordance with and embodies the present invention; Fig. 4 is a side elevational view of the apparatus of Fig. 3 for constructing the end domes; Fig. 5 is a top plan view of the apparatus of Fig. 2 for making the side wall of a filament reinforced storage tank, and which is constructed in accordance with and embodies the present invention; FIGS. 6 and 7 are vertical sectional views taken along lines 6-6 and 7-7 respectively of Fig. 3; Fig. 8 is a fragmentary sectional view taken along line 8-8 of Fig. 7. Fig. 9 is a vertical fragmentary sectional view taken along line 9-9 of Fig. 3; Fig. 10 is a vertical fragmentary sectional view taken along line 10-10 of Fig. 9; Fig. 11 is a vertical fragmentary sectional view taken along line 11-11 of Fig. 10; Fig. 12 is a horizontal fragmentary sectional view taken along line 12-12 of Fig. 10; Fig. 13 is a front elevational view of a portion of the apparatus of FIGS. 2 and 5 for forming the side wall of the tank; Fig. 14 is a vertical sectional view taken along line 14-14 of Fig. 13; FIGS. 15 and 16 are fragmentary sectional views taken along lines 15-15 and 16-16, respectively, of Fig. 13; Fig. 17 is an end elevational view showing the carriage forming part of the apparatus of Fig. 13; Fig. 18 is a vertical fragmentary sectional view taken along line 18-18 of Fig. 17; Fig. 19 is a vertical fragmentary sectional view taken along line 19-19 of Fig. 17 and showing the lance supporting frame forming part of the present invention; FIGS. 20-27 are a series of sequential schematic sectional views showing the application of strands to a mold to form the side wall shell of a tank, of which; Fig. 20 is a schematic side elevational view showing the initial laying of circumferential filament strands in a groove forming part of the mold of the present invention; Fig. 21 is a top plan view showing the laying of circumferential filament strands in the grooves forming part of the mold of the present invention; Fig. 22 is a schematic end elevational view showing the laying of a second layer of fiberglass strands in the form of spirals; Fig. 23 is a schematic top plan view showing the application of the second layer of strands in the form of spirals in the fabrication of the side wall shell; Fig. 24 is a schematic side elevational view showing the application of the third layer of strands in the form of circumferential elements in the fabrication of the side wall shell; Fig. 25 is a top plan view showing the application of the third layer in the form of circumferential strands; Fig. 26 is a schematic side elevational view showing the laying of filament strands in the form of spirals to constitute the fourth layer; Fig. 27 is a schematic top, plan view showing the laying of the filament strands in the form of spirals to constitute the fourth layer. Fig. 28 comprises three schematic sectional views showing the various stages in securing the end domes to the tank side wall of which: Fig. 28a is a fragmentary vertical sectional view showing a portion of the mold used to form the tank side wall; Fig. 28b is a fragmentary vertical sectional view showing a portion of the side wall formed in the mold; and Fig. 28c discloses the technique of incorporating a flange on the end dome integrally into the tank side wall. Fig. 29 is a perspective view showing the finished tank forming part of the present invention; Fig. 30 is a vertical sectional view showing the interior of the finished tank of Fig. 28; Fig. 31 is a perspective view of a modified form of apparatus for forming the storage tank side wall of the present invention; and Fig. 32 is a side elevational view of the apparatus of Fig. 30. GENERAL DESCRIPTION The present invention provides a unique method for constructing underground storage tanks on a rapid and economical basis. This method is described hereinafter in detail. A particular embodiment of an apparatus suitable for accomplishing the method of the present invention is also illustrated and described herein. The storage tanks of the present invention are constructed by separately forming an annular cylindrical tank shell or so-called "annular side wall" in a three-piece mold. The end domes, which are ultimately secured to the annular side wall are also formed in a separate female mold. The end domes are prefabricated in a circular metal female mold which is positioned horizontally and has a concave major surface, contoured to form the dome portion. The mold is also provided with an integral circular ring extending upwardly from the concave major surface. The mold is heated and a thin film of solvent dispersed mold release is sprayed upon the concave surface thereof. Thereafter a resin gel coating may be optionally sprayed over the entire mold surface. The gel coating, if employed, should be pigmented with an inert colloid. After the gel has been allowed to stiffen slightly, fiberglass filaments are laid on the entire surface in a spray of catalyzed binder resin. The mold is rotated about its axis of rotation and the speed of rotation is automatically programmed to coincide with the rate and pattern at which the glass filaments are applied. As the fiberglass deposition path increases radially outward from the axis of rotation of the mold, the speed of the mold is proportionally reduced. The circular upstanding peripheral flange only carries a sufficient amount of binder-resin to hold the filaments in place to create a slightly rigid self-supporting flange. The end dome will have a raised center embossment forming a small hole in the end dome which is locally reinforced about its periphery and root. This hole formed in the end dome allows access for subsequent processing. The annular side wall of the storage tank is formed in a three-piece external cylindrical mold. In essence, the mold is divided into three curved longitudinal plates arranged 120° apart. One of the curved plates is hinged along both edges to each of the other two plates. These plates are, in turn, fastened together along the remaining respective edges by a full length quick release cam lock mechanism. The interior surface of the mold is highly polished and contains a plurality of circumferential grooves longitudinally spaced along the length of the cylinder. The grooves are approximately 6" wide by 2" deep and form the tanks reinforcing ribs, or so-called "external -hoops." These ribs assure adequate buckling resistance in the finished tank wall structure. In addition, the ends of the cylindrical mold are recessed to receive the circumferential rim flanges of both of the end domes which are separately prefabricated. External restraining lugs are also provided to hold the end domes securely and accurately in position. The cylindrical metal mold is also warmed and is rotated about its major axis. The cylindrical support and transfer of rotating force is accomplished by conventional drive rollers and idlers. A lance arrangement comprising several tubes' is inserted into the tank interior along its major axis. The lance carries a plurality of axially spaced radially directed tubes for transporting the glass filament rovings. Additional tubes are carried by the lances to deliver the liquid binder-resin. It is also possible to have the lance carry high intensity lights for allowing an operator to view the process and monitor the operations. When the prefabricated end domes are locked into position, and the lance is inserted for its full length into the tank mold interior the mold is rotated initially at a relatively slow speed. A solvent dispersed mold release agent is sprayed by the leading tube on the inner metal surface as the lance is being inserted into the cylindrical metal mold. Following this, an exterior gel coat is applied and allowed to stiffen. These materials are substantially the same as those employed in the end dome fabrication. After the application of the mold release agent and the binder-resin, the speed of rotation of the cylindrical mold is increased. All but two of the filament nozzles lay circumferential rovings into the grooves longitudinally spaced along the length of the mold. It is also possible to add a particulate matter to the resin-glass composition during the formation of the side wall of the tank, as well as in the end dome fabrication. A

separate nozzle carried by the lance would be capable of applying the proper amount of metered sand or other particulate matter during the formation of the component. The amount of sand added is regulated in accordance with the structural properties desired in the final product as well as the surface appearance to be achieved. In addition, the particulate matter filler is a relatively inexpensive component and the amount used would be dependent upon the overall economies which are desired in the fabrication of the components. This coverage is obtained by reciprocating the lance back and forth horizontally. Furthermore, this filament application is continued until an initial high-density structural layer in the form of a fiat ring is obtained in each hoop. Thereafter, the speed of rotation of the mold is reduced or the glass feed rate is increased and glass filaments are caused to lay down in the form of overlapping continuous flat spirals until the groove is filled. Flat bands of filament spirals are also applied by the two remaining filament nozzles to the peripheral flanges of the end dome. Thereafter, the rotational velocity of the mold is again increased to its original velocity to lay down complete and continuous layers of circumferential windings or so-called "circumferentials" over the entire inner mold surface. The lance reciprocates during the rotation of the mold. Simultaneously with the laying of the continuous filaments, a -light spray of liquid, catalyzed binder resin has also been applied. Particulate matter may also be added during this time as well. After the application of the surface shell of circumferential strands, the mold is again slowed and a flat spiral core deposition is resumed in the manner as previously described. This spiral deposition is applied to the entire inner surface and also to the end dome flanges. This filament application is continued until the design shell-wall thickness has been achieved. Thereafter, the mold speed of rotation is increased and additional liquid resin is applied in the form of a very thin resin float on the inner surface. The -inherent centripetal force from the rotation of the mold aids in compacting the glass-resin composite. Furthermore, the end dome rims are now merged into an integral part of the whole tank structure with a resin-rich inner surface now extended to bond with- that of the prefabricated end dome. This type of construction essentially forms a unitized one-piece structure with an unbroken shell structure and inner "skin." After allowing sufficient time for the resin to cure, the mold is stopped and the end dome restraining lugs are relieved. The mold is unlocked and swung open and the finished tank is lifted out. Thereafter, subsequent finishing operations and hardware attaching operations may be employed.. The present invention includes a number of unique aspects in the fabrication of storage tanks and similar structures. One of the unique aspects resides in the centrifugal application to the interior surface of a rotating mold of a combination of glass strands and resin in predetermined properly metered quantities to form a structural shape. Furthermore, the invention includes the application of glass strands in combination with a curable resin and a particulate matter such as sand,or the like, to the

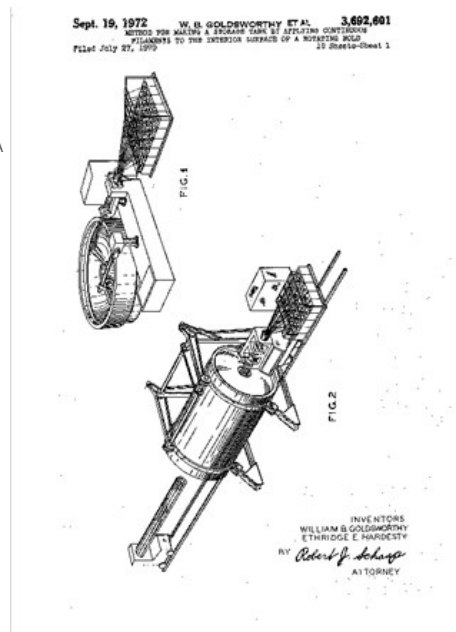
interior surface of a rotating mold in such quantities as to produce a,tank structure with sufficient wall thickness to resist compressive buckling loads in a relatively inexpensive manner. The quantities of these materials are all properly metered and deposited on the interior surface of the mold in properly timed relationship to form the predetermined desired structure. A further unique aspect of the present invention resides in a mechanism for employing a lance capable of depositing the resin, the particulate matter and the glass strands to the interior surface of the mold where the rate of reciprocative movement of the lance is properly programmed to the speed of rotation of the mold in such manner that glass strands can be applied to the interior surface of the mold in a circumferential pattern, such as occurs in filament winding on an external surface, or in helically formed strands, or in a swirl pattern. In addition to the foregoing, the present invention also provides an apparatus which includes a number of unique aspects for accomplishing the various operations necessary in the fabrication of both the end domes and the tank side wall. In addition to the foregoing, the present invention provides a unique method of bonding the end dome to the tank side wall by providing an end dome with a resinstarved peripheral flange which is capable of being wound into the tank side wall during the formation of the tank side wall so that the end dome actually becomes an integral inclusion in the formation of the tank side wall. METHOD The entire tank is constructed by performing each of the end walls or so-called "end domes" in the apparatus illustrated in Fig. 1. In essence, a pair of end domes are formed and these end domes are connected to and structurally intergrated into a tank side wall hereinafter described. In the formation of the end domes, a resin matrix is laid in the mold surface and the fiber reinforced material is thereafter deposited on the resin layer. Generally, the mold is rotated at a speed which is programmed to the filament deposition rate. In one embodiment of the invention, it is possible to rotate the mold and employ a series of feeding heads which extend for the radius of the mold, thereby applying a continuous layer of filament to the mold surface as it rotates. As another embodiment, it is possible to reciprocate the filament feeding tube for a distance equal to the radius of the mold as the mold rotates. Furthermore, it is also possible to rotate the filament feeding tube about the mold in circles of increasing radii in order to lay continuous filament strands on the entire surface of the mold. The mold. is also heated in order to obtain faster ". solidification of the binder resin and shorter cure time in the completed lay-up. If desired, a solvent-dispersed mold release may be sprayed upon the surface of the mold prior to the time that the resin matrix and filaments are laid therein. The filaments are laid in such fashion that they cover the entire crown surface of the mold and extend up onto a center embossment in order to provide a locally reinforced center aperture. In addition, the mold has a side wall which is also designed to receive the filament strands. However, this latter portion of the mold will have a resin starved layer so that the portion of 1 filament strands which form a peripheral flange on the end dome is rather dry and contains only enough resin to hold the filaments in place. After the end domes have been formed, they can be conveniently removed from the mold. For this purpose, I the mold may be a segmented mold divided into a plurality of arcuate sections which are designed to shift radially in order to enable the removal of the mold. Any conventional mechanism, however, for removing the final end dome from the mold may be employed. 2 The mechanism for producing the annular side wall of the tank and for integrally including the end domes in the formation of the annular side wall is more fully illustrated in Fig. 2. A number of sequences are performed during the actual tank formation. By reference to Fig. 2, it can be seen that the mold for producing the annular side wall is segmented and each of the sections is arcuately pivotal so that the side wall formed therein can be removed. It can be seen that a pallet containing a series of roving spools are shiftable with a feed carriage, the latter containing a lance which extends into the mold. As an initial step in the formation of the tank structure, the previously prefabricated end domes are inserted into the transverse ends of the cylindrical mold. Thereafter, a lance which feeds both the filament from the pallet and which contains resin applicators is inserted through the aperture of the end dome into the cylindrical mold. After the lance arrangement which carries the filament and resin matrix has been inserted into the mold, the resin applicators are actuated to lay a thin resin layer on the surface of the mold while the mold is rotating. Furthermore, the mold is rotating at a relatively slow speed which is only sufficient to cause the centrifugal force to hold the resin against the side wall. Thereafter, the filament feeding nozzles which are mounted on the lance are advanced to a point where they are close to grooved surfaces on the interior of the mold. The mold is provided with a series of longitudinally spaced circumferential grooves which are designed to form external hoops in the final tank side wall. After the filament feed nozzles have been advanced close to the surface of the grooves, a layer of filament is laid into each of the grooves at a rate identical to the peripheral speed of the surface through the rotation of the mold. At this point, the lance is advanced causing the fibers to lay side-by-side within the confines of each of the grooves. It should be recognized that an individual feeding nozzle is provided for each groove. In order to provide a fiber thickness of several layers, the lance may be shifted so that the feed nozzles are shifted several times between the limits of the grooves. After each of the mold grooves have been filled with the filament applied in a side-by-side pattern, much in the same manner as employed in conventional filament winding techniques, the rate of filament feeding to the feeding nozzles is changed. Metering rollers are provided for regulation of feed rate and are programmed to account for the change in peripheral speed of the deposition surface. As the filaments are applied to the groove, the build-up will reduce the overall radius of filament application and accordingly, the peripheral speed thereof will change. Inasmuch as the filament must be applied at the same rate as the peripheral speed of the deposition surface moving past the filament nozzles, the metering rollers are designed to account for this change in peripheral speed. 5 After the grooves have been completely filled, the amplitude of the lance reciprocation is increased to a distance which is slightly greater than the distance between the two grooves. Actually, each feeding nozzle will move from the midpoint of the area between one set of grooves to the midpoint of the area existing between the next adjacent set of grooves. The filament is laid down in flat strands which are adjacent to each other until the nominal wall thickness has been attained. The speed of rotation of the mold and the speed of reciprocation of the lance is held constant and the glass feed rate is materially increased by an order of magnitude to cause the filaments to lay in a swirl or spiral pattern. Simultaneously with the laying of the enlarged quantity of filament in these patterns, a resin spray from the resin feeding heads is applied and the rate of application is commensurate with the amount of glass deposited in the mold. It should be recognized that as an alternative, the glass feed rate could be maintained constant and the speed.0 of rotation of the mold could be reduced in order to increase the amount of glass laid in the mold per unit of time. This build-up of swirl pattern filaments is continued until the desired wall thickness is attained. Thereafter, the resin application is ceased and the speed of rotation of the mold is increased. By placing a maximum centrifugal force on the deposited materials, it is possible to densify the materials and "float out" the entrained air. In addition, this type of action will cause the resin to move to the inner surface since the resin has a lower density than the reinforcing material. This will also cause a resin-rich inner layer which, in turn, forms a rather unique seal which can be further enhanced by the addition of small thin glass flakes. The mold is continually rotated at this speed and the lance is removed. As an alternative, particulate matter, such as sand, may be added during the formation of either the end domes or the tank side wall, or both. The amount of sand typically would range from approximately 10 percent by weight of the total composition to approximately 90 percent by weight of the total composition. The sand is added either simultaneously with the application of the resin or at intermittent time intervals with respect to the resin. Separate nozzles are provided on the lance for adding the sand. In addition, the sand would be metered in order to provide the proper amount. A longitudinally shiftable heater is located on the opposite side of the cylindrical mold with respect to the lance structure. After removal of the lance, the heater can be inserted through the central aperture of the opposite end dome and into the mold causing the resin impregnated reinforced fiberglass to cure. It should be noted that the relatively resin-poor peripheral flange on each of the end domes has been integrally included in the winding process during the formation of the annular side wall. Furthermore, this flange becomes an integral part of the side wall during the impregnation of the resin and overwindings of filament strands, thereby causing a structurally rigid fluidtight seal to exist between each of the end domes and the annular side wall. It should be recognized that the side wall could be discretely formed with the end domes adhesively or otherwise secured to the side wall after the latter has been cured. By the unique methods described herein, it can be seen that it is possible to produce a relatively large tank for liquid storage by centrifugal casting of continuous filament strands. Furthermore, it is possible to build a relatively thick side wall in a relatively short period of time and to produce a resin-rich inner surface on the interior surface of the tank. In addition, the glass is transported by an air vehicle in the lance and this type of arrangement materially reduces the normal problem encountered in the transporting of fiberglass. The tank produced by the method and the apparatus of the present invention is rather unique in that it is capable of withstanding high compression loads. Normally, surface tanks are designed to have a high burst strength with high top loads. However, the underground tanks must also be able to withstand high compression loads. Accordingly, the conventional filament winding techniques are not applicable for producing the desired type of underground storage tank. The tank of the present invention is uniquely designed to produce a side wall with a high buckling modulus. The filament winding technique alone will provide a tank shell or side wall with a high degree of tensile strength and some io compressive strength. By using the combination of filament placement and the type of resin and fiber reinforced deposition employed herein, it is also possible to obtain the high buckling modulus. In order to accomplish the method of the present invention, a preferred embodiment of the apparatus for producing the storage tank described herein is more fully illustrated and described. It should be recognized that there are a number of components which can be substituted for the components herein described in this particular embodiment of the apparatus. For example, pneumatic drive systems could be conveniently substituted for the gear drive systems illustrated and described herein. Nevertheless, the particular embodiments of the apparatus herein described and illustrated have been found to be the most preferred embodiments.

Classifications:

International (IPC 8-9): B07C1/02 B29C31/00 B29C41/20 B29C53/72 B29C53/80

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B29C70/32 B29D22/00 (Advanced/Invention);
B07C1/00 B29C31/00 B29C41/02 B29C53/00 B29C70/04 (Core/Invention)
International (IPC 1-7): B29C5/00 B29C5/04 B29D23/00 B29D23/08 B29D23/12
B29D3/02 B32B1/00 B32B31/16 B32B5/22 B32B5/26 B65H81/00
CPC: B07C1/025 B29C31/002 B29C53/8016 B29D22/00 B29K2105/0061 B29L2023/22
B29L2025/00 B29L2031/565 B29L2031/712 Y10S220/917 B29C70/326 B29C41/20
B29C53/72 B29C70/323 B29K2105/06
European: B07C1/02C B29C31/00B B29C41/20 B29C53/72 B29C53/80B2 B29C70/32A
B29C70/32A2 B29D22/00 L29K105/00G2 L29K105/06 L29L23/22 L29L25/00 L29L31/56B
L29L31/712
US: 156/169 156/173 156/175 156/381 156/425 156/433 156/446 156/6.9 156/69
156/74 220/560.04 220/567.1 220/567.2 220/590 220/592 220/62.19 220/917 226/97.4
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Priority:

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US19720244189 19720414 DE19722250706 19721016 GB19720046241 19721006

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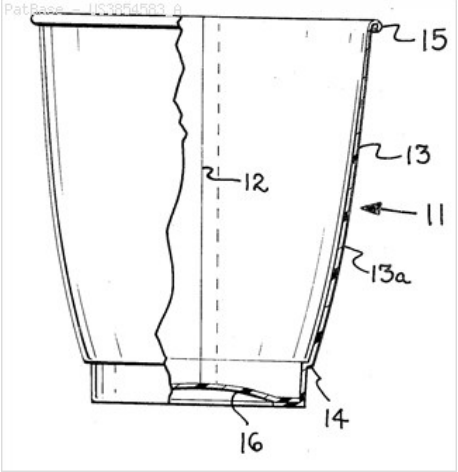
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Title: NESTABLE FABRICATED THERMOPLASTIC CONTAINER AND METHOD OF FABRICATION SAME

Abstract: Source: US3854583A A fabricated cup or other nestable container in which the sidewall is formed from a rectangular sheet-like blank of a thermoplastic material, particularly an expanded thermoplastic material, the blank having its ends joined to one another in a liquid-tight seam extending the full height thereof to form a sleeve, the blank having a relatively high degree of orientation or heat-shrinkability extending circumferentially of the sleeve, the fabrication of the sidewall from the sleeve being accomplished by telescoping the sleeve over a generally frusto-conically shaped mandrel, by exposing the sleeve to heat to cause it shrink to conform to the configuration of the mandrel and by stripping the shrunken sleeve from the mandrel. A two-piece container may be formed from such a sidewall by affixing an end closure element to the bottom or smaller end of the sidewall. A one-piece container may also be formed in this manner by using a blank of sufficient height so that a substantial portion of the sleeve formed therefrom extends beyond the smaller end of the forming mandrel, such substantial portion, when the sleeve is exposed to heat, being shrinkable to form an annular planar portion disposed transversely of the longitudinal axis of the mandrel and a relatively small tubulation which extends longitudinally from the interior of the annular planar portion and which, by the application of pressure thereto while at elevated temperature, may be caused to collapse and fuse together to close the bottom of the container in a liquid-tight manner. A container of this type may be used to advantage to contain any liquid or other fluent product therein in face to face contact with the interior surface of the sidewall thereof, and when the container is fabricated from an expanded material, because of the insulating characteristics of such material, a container fabricated therefrom may be used to particular advantage as a handholdable cup for coffee or other hot beverage.

Classifications:

International (IPC 8-9): A47G19/22 A47G19/23 B29C51/00 B29C53/00 B29C53/42 B29C53/44 B29C53/84 B29C61/00 B29C61/02 B29C65/00 B29C65/10 B29C65/74 B29C65/78 B29C67/00 B29C69/00 B29D22/00 B29D23/00 B29D24/00 B31C7/06 B65D1/00 B65D1/26 B65D21/02 B65D21/032 B65D8/00 (Advanced/Invention); B29C53/00 B29C61/00 B29C65/00 B29C65/10 B29C65/78 B29D22/00 B29D23/00 B29D24/00 B65D1/00 B65D1/26 B65D21/02 (Advanced/Non-invention); A47G19/22 B29C51/00 B29C53/00 B29C61/00 B29C65/00 B29C65/10 B29C65/74 B29C65/78 B29C67/00 B29C69/00 B29D22/00 B29D23/00 B29D24/00 B31C7/06 B65D1/00 B65D1/22 B65D21/02 B65D21/032 B65D8/00 (Core/Invention)
International (IPC 1-7): A47G19/22 A47G19/23 B29C17/00 B29C17/02 B29C17/03 B29C17/07 B29C24/00 B29C27/02 B29C27/14 B29C27/20 B29C27/28 B29C53/04 B29C65/10 B29D23/00 B29D23/01 B29D23/10 B29D27/00 B29F5/00 B31B17/02 B65B51/14 B65D1/00 B65D1/10 B65D1/16 B65D1/22 B65D1/26 B65D1/40 B65D11/02 B65D21/00 B65D21/02 B65D3/06 B65D8/00 B65D8/04
CPC: B65D11/02 B29C47/0023 B29C47/0057 B29C65/10 B29C53/42 B29C66/1122 B29C66/43 B29C47/0042 B29C47/0061 B29C47/043 B29K2105/04 B29C47/0021 B29C47/004 B29C66/4322 B65D1/265 B29C47/0026 B29C47/0038 B29C47/0054 B29C47/0059 B29C47/0066 B29C47/0069 B29C61/025 B29C67/00 B29C69/00 B29C2793/0063 Y10T156/1002 Y10T156/1005 Y10T156/1033 Y10T156/1038 B29C66/8322 B29C66/49 B29C66/73921
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US3970492 A	19760720	US19740479421	19740614	
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US4088526 A	19780509	US19760683466	19760505	
US4106397 A	19780815	US19760683893	19760506	
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Priority:

US19710211259 19711223	US19730354305 19730425	NL19740005454 19740423
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US19740479421 19740614	DE19742462343 19740425	CA19770282601 19770713

Probable Assignee: OWENS ILLINOIS PLASTIC PRODUCTS INC A CORP OF DE

Assignee(s): (std): OWENS ILLINOIS INC ; AWENS ILLINOIS INC

Assignee(s): BANKERS TRUST CO ; BANKERS TRUST CO COLLATERAL AGENT AS ; DOHERTY THOMAS E ; OWENS ILLINOIS ; AMBERG STEPHEN W ; OWENS ILLINOIS PLASTIC PRODUCTS INC ; SWEETHEART CUP CO INC ; OWENS ILLINOIS INC US ; OWENS ILLINOIS INC TOLEDO OHIO V ST A ; OWENS ILLINOIS INC TE TOLEDO OHIO VER ST V AM ; OWENS ILLINOIS PLASTIC PRODUCTS INC A CORP OF DE ; OWENS ILLINOIS INC TOLEDO OHIO US

Inventor(s): (std): AMBERG STEPHEN WALTER ; DOHERTY THOMAS EDWARD ; SUTEIIBUN UORUTAA ANBAAGU ; DOHERTY THOMAS E ; DOHERTY T E ; DOHERTY T ; AMBERG STEPHEN W ; AMBERG S W ; AMBERG S ; TOOMASU EDOWAADO DOHATEII

Inventor(s): T E DOHERTY ; DOHERTY T US ; AMBERG S US ; AMBERG STEPHEN WALTER TOLEDO OHIO US ; AMBERG STEPHEN WALTER TOLEDO OHIO ; AMBERG STEPHEN WALTER TOLEDO ; AMBERG STEPHEN WALTER ST JAMES ; STEPHEN WALTER AMBERG AND THOMAS EDWARD DOHERTY ; S W AMBERG ; EDWARD DOHERTY THOMAS ; DOHERTY THOMAS EDWARD SETAUKET NY ; DOHERTY THOMAS EDWARD SETAUKET N Y ; DOHERTY THOMAS EDWARD SETAUKET ; STEPHEN WALTER AMBERG ; THOMAS EDWARD DOHERTY ; WALTER AMBERG STEPHEN

Title: PACKAGING APPARATUS AND TECHNIQUES

Abstract: Source: US3805486A Automatic packaging apparatus and methods for packaging food products such as bacon in evacuated or gas-filled packages. The disclosed machine is capable of convexly thermoforming two webs of packaging material into respective sets of pockets which are brought together in opposed positions to enclose the product. One preferred package made by the disclosed techniques comprises a transparent semi-rigid cup-like shell and a back-formed flexible film sealed over the shell opening. In operation of the disclosed machine, the product is loaded into the semi-rigid package shell from below, so that the upper sides of the product as introduced into the machine are pressed up against the inside surface of the shell, and after evacuation are held in that position by atmospheric pressure acting through the flexible film beneath the product. Thus, such upper sides of the product are visible through the transparent shell which serves as the display side of the package.

Classifications:

International (IPC 8-9): B29C51/22 B65B31/02 B65B31/04 B65B41/14

B65B9/04 (Advanced/Invention);

B65B31/02 B65B31/04 B65B41/00 B65B9/00 (Core/Invention)

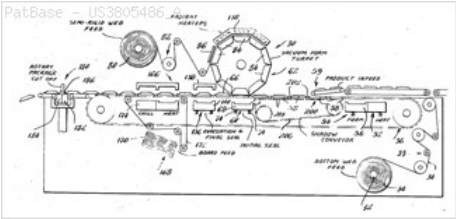
International (IPC 1-7): B65B31/02 B65B31/04 B65B35/56 B65B41/14 B65B41/18

B65B43/00 B65B47/02 B65B47/10 B65B9/04

CPC: B29C51/22 B65B9/04 B65B31/021 B65B65/02 B65B41/14

European: B29C51/22 B65B31/02C B65B41/14 B65B65/02 B65B9/04

US: 425/388 53/167 53/184 53/22A 53/427 53/433 53/450 53/453 53/511 53/555 53/559



Family:

Publication number	Publication date	Application number	Application date
CA1004129 A1	19770125	CA19730167985	19730405
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JP57005723 B4	19820201	JP19730061395	19730531
US3805486 A	19740423	US19720258320	19720531
US4034536 A	19770712	US19760745296	19761126

Priority:

US19720258320 19720531	CA19730167985 19730405	US19750579939 19750522
US19730427790 19731223	CA19760258796 19760810	US19760695022 19760611
US19760745296 19761126		

Probable Assignee: MAHAFFY AND HARDER ENG CO

Assignee(s): (std): MAHAFFY HARDER ENGINEERING CO ; MAHAFFY AND HARDER ENG CO ; MAHAFFY AND HARDER ENGINEERING

Assignee(s): MAHAFFY AND HARDER ENGINEERING CO ; MAHAFFY AND HARDER ENG CO US ; HAMILTON JOEL A ; MAHAFFY HARDER ENGINEERING CO US ; MAHAFFY AND HARDER ENGINEERING COMPANY ; MAHAFFY HARDER ENG CO ; MAHAFFY AND HARDER ENGINEERING CO TOTOWA N J V ST ; MAHAFFY AND HARDER ENGINEERING CO TOTOWA N J US ; MAHAFFY AND HARDER ENGINEERING CO TOTOWA N J V ST A ; PINNEY WESLEY W ; MAHAFFY REID A

Inventor(s): (std): HAMILTON JOEL A ; MAHAFFY REID A ; PINNEY WESLEY W ; PINNEY W ; MAHAFFY R ; HAMILTON J

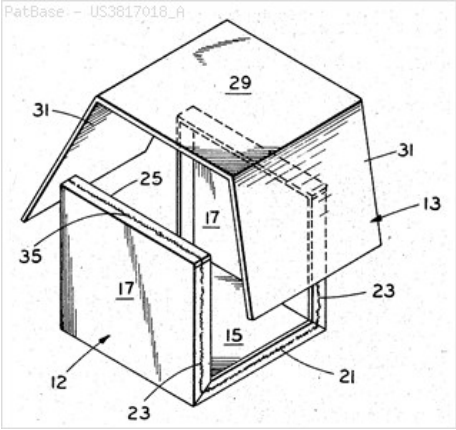
Inventor(s): HAMILTON J US ; HAMILTON JOEL A ENGLEWOOD N J US ; HAMILTON JOEL A ENGLEWOOD ; MAHAFFY REID A MONTCLAIR N J US ; MAHAFFY REID A MONTCLAIR ; PINNEY WESLEY W UPPER MONTCLAIR ; PINNEY WESLEY W UPPER MONTCLAIR N J US ; PINNEY W US ; MAHAFFY R US

Title: METHOD FOR FORMING A PACKAGE

Abstract: Source: US3817018A A method for forming a package containing a quantity of lading wherein the container for the lading is formed from two blanks made of rigid foldable material, each including an end wall and alternate side wall forming panels, one being unflanged and one including peripheral flanges along each longitudinal edge. The method includes the steps of: forming one of the blanks into a generally U-shape while concurrently partially surrounding the lading, forming the second blank into a generally U-shape concurrently partially surrounding the first blank and its lading with the end wall forming panels in opposed facing relation, and securing each alternate side wall forming panel of the unflanged blank to the peripheral flanges along one longitudinal edge of the flanged blank to form the package. The blanks are not attached together during the folding operations.

Classifications:

International (IPC 8-9): B31B1/30 B31B17/00 B65B11/00 B65B11/18 B65B11/58 B65B35/40 B65B41/06 B65B41/08 B65B49/02 B65B49/08 B65B5/02 B65B5/06 B65B51/02 B65B7/28 B65D5/32 B65H1/02 B65H3/08 B65H3/44 B65H5/10 (Advanced/Invention); B65B11/00 (Advanced/Non-invention); B31B1/00 B31B17/00 B65B11/00 B65B11/06 B65B35/30 B65B41/00 B65B49/00 B65B5/00 B65B5/06 B65B51/00 B65B7/28 B65H1/02 B65H3/08 B65H3/44 B65H5/08 (Core/Invention)
International (IPC 1-7): B65B11/00 B65B11/02 B65B11/18 B65B11/50 B65B11/58 B65B35/40 B65B41/06 B65B41/08 B65B49/02 B65B49/08 B65B5/00 B65B51/02 B65H1/02 B65H3/08 B65H3/44 B65H5/10
CPC: B65B11/004 B65B11/18 B65B11/58 B65D5/324 B65B49/02
European: B65B11/00D B65B11/18 B65B11/58 B65B49/02 B65D5/32B2
US: 53/207 53/209 53/231 53/3.2 53/376.4 53/387.2 53/462



Family:

Publication number	Publication date	Application number	Application date
CA1001059 A1	19761207	CA19740217022	19741227
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DE2461669 A1	19750828	DE19742461669	19741227
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GB1413603 A	19751112	GB19730033816	19730716
GB1461539 A	19770113	GB19740055943	19741227
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JP50118892 A2	19750917	JP19740149095	19741227
JP51014484 A2	19760204	JP19750072796	19750617
US3817018 A	19740618	US19720285211	19720831
US3872650 A	19750325	US19740446124	19740227
US3896601 A	19750729	US19740480160	19740617
US3956874 A	19760518	US19750592927	19750703

Priority:
US19700057945 19700724 US19720446124 19720227 US19750592927 19750703
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Probable Assignee: STONE CONTAINER CORP
Assignee(s): (std): STONE CONTAINER CORP ; SUTOON KONTEENAA CORP
Assignee(s): VICKERS JAMES L ; WAYCIE EDMUND A ; STONE CONTAINER CORP US
Inventor(s): (std): EDMANDO EE UEISHII ; JEEMUZU RII BITSUKAASU ; VICKERS J ; VICKERS JAMES L ; VICKERS JAMES LEE ; WAYCIE EDMUND A
Inventor(s): A WAYCIE EDMUND ; VICKERS J US ; LEE VICKERS JAMES

Diego Cardenas

Search history

Search 1: PD<20120306 and IC=(B65B OR B65D OR B29C) (Results 100000)
Search 2: TAC=((seal* AND (container OR cover OR cavitie* OR packag*)) AND ((method* OR process* OR procedure*) AND (system OR device OR apparatus OR machine))) and PD<20120306 (Results 100000)
Search 3: 1 and 2 (Results 28057)
Search 4: 3 and (seal* and member) (Results 8647)
Search 5: 4 and (lid OR top) (Results 3956)
Search 6: 5 and conveyor (Results 545)
Search 7: 6 and (non planar flange) (Results 0)
Search 8: 6 and (curve* flange*) (Results 0)
Search 9: 6 and (curve* and flange*) (Results 33)
Search 10: 5 and (conveyor AND cavitie*) (Results 36)
Search 11: 5 and (seal* AND (drum OR cylinder)) (Results 174)
Search 12: 10 and 11 (Results 10)

Title: WEB-CLAMPING APPARATUS

Abstract: Source: US3632268A In a continuous motion container molding machine for forming thin-wall, disposable, plastic containers, circumferential, opposed web clamping means are arranged to provide angular and rotational displacement thereof after being clamped to a moving web of heated thermoplastic material traveling in a linear path, thereby permitting the web-clamping means to move in a predetermined arcuate path and enabling containers to be formed from the area of the web within the circumferential, opposed web-clamping means.

Classifications:

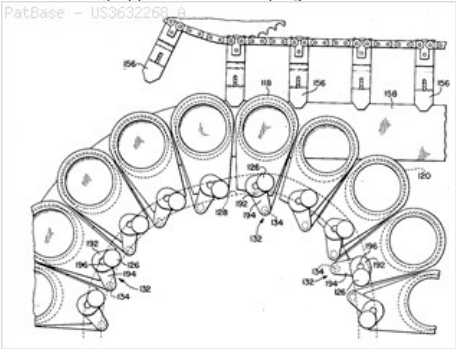
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International (IPC 1-7): B29B5/04 B29C13/02 B29C17/00 B29C17/02 B29C17/03 B29C17/04 B29C3/04 B29C7/00 B29D23/00 B29D23/13 B65H17/34 C08F8/28 C08L33/20

CPC: B29C33/442 B29C51/44 B65H20/16 C08J3/09 C08J2333/20 D01F6/18 Y105425/048 B29C51/22 B29C51/261

European: B29C33/44B B29C51/22 B29C51/26B B29C51/44 B65H20/16 C08J3/09 D01F6/18 M08J333/20

US: 226/173 264/163 264/297 264/297.6 264/310 264/322 264/551 425/143 425/168 425/216 425/292 425/348 425/348R 425/350 425/388 425/397 425/405.1 425/437 425/DIG.48



Family:

Publication number	Publication date	Application number	Application date
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DE925196 A	19550314	DE1952S026717	19520106
FR1032839 A	19530706		19510219
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US3605192 A	19710920	US19690845270	19690728
US3632268 A	19720104	US19690875882	19691112
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Priority:

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US19690875881 19691112
DE19702065806 19700725
GB19700036531 19700728
CA19720133426 19720128

Probable Assignee: ILLINOIS TOOL WORKS

Assignee(s): (std): ILLINOIS TOOL WORKS ; ILLINOIS TOOL WORKS INC 8501 WEST HIGGINS ROAD CH ; RHODIACETA ; ILLINOIS TOOL WORKS INC TE CHICAGO ILLINOIS VER ST ; ILLINOIS TOOL WORKS INC CHICAGO ILLINOIS VER ST V

Assignee(s): ILLINOIS TOOL WORKS INC 8501 WEST HIGGINS ROAD CHI ; ILLINOIS TOOL WORKS INC 8501 WEST HIGGINS ROAD CHICAGO ILLINOIS 60631 E U A ; ILLINOIS TOOL WORKS INC CHICAGO ILLINOIS VER ST V AM ; ILLINOIS TOOL WORKS INC TE CHICAGO ILLINOIS VER ST V AM ; WALTER C DIENER ; SOCIETE RHODIACETA ; ILLINOIS TOOL WORKS INC US ; ILLINOIS TOOL WORKS INC CHICAGO ILL V ST A ; ILLINOIS TOOL WORKS INC ; BRYANT EDWARDS ; DART CONTAINER CORP ; HENRY POMERNACKI

Inventor(s): (std): BRYANT EDWARDS CLARENDON HILLS ILL ; DIENER C W ; DIENER W C ; EDWARDS B ; B EDWARDS ; POMERNACKI H ; POMERNACKI HENRY ; MOSSE PIERRE ; EDWARDS BRYANT ; DIENER WALTER C ; SOCIETE RHODIACETA

Inventor(s): RHODIACETA SOCIETE ; POMERNACKI HENRY NORTHBROOK ; WALTER C DIENER ; BRYANT EDWARDS ; EDWARDS B US ; EDWARDS BRYANT CLARENDON HILLS ; EDWARDS BRYANT CLARENDON HILLS POMERNACKI ; EDWARDS BRYANT CLARENDON HILLS POMERNACKI HENRY NO ; EDWARDS BRYANT CLARENDON HILLS POMERNACKI HENRY NORTHBROOK DIENER WALTER C ; HENRY POMERNACKI ; DIENER WALTER C OAK PARK

Title: Method and machine for manufacturing, filling, and closing of bags

Abstract: Source: US2823502A (Claim 1) What is claimed is: 1. A machine for the manufacture and wrapping of individual tea bags and the like comprising means to hold a supply of a strip of liquid-penetratable bag-forming material, a feed roller assembly including a shuttle roller adapted to act intermittently to draw said strip from said supply means to insure a uniform feeding thereof from said assembly, a dosing assembly for depositing doses of tea and the like at spaced intervals along said strip, folding means for forming said strip into a Hat tube around said doses, cutting shears for severing segments from said tube, a first conveyor wheel having a plurality of segmentreceiving zones spaced thereabout, each of said zones having therein anvil means for forming a W-fold at the midpoint of each of said segments and bag holding arms adapted to grasp the respective segments after said fold is formed, a plurality of devices spaced about the periphery of said first conveyor wheel to formbags including first and second forming devices having therein anvil and blade means for folding the outwardly extending flap portions of said segments, a.

Classifications:

International (IPC 8-9): B65B29/02 (Advanced/Invention);
B65B29/00 (Core/Invention)

International (IPC 1-7): B65B29/02 B65D33/00

CPC: B65B29/02

European: B65B29/02

US: 206/0.5 53/133.3 53/134.2 53/138.4 53/171 53/174 53/544 53/547

Image not currently available

Family:

Publication number	Publication date	Application number	Application date
US2823502 A	19580218	US19520276537	19520314

Priority:

19510315

Probable Assignee: RAMBOLD ADOLF G F

Assignee(s): (std): RAMBOLD ADOLF G F

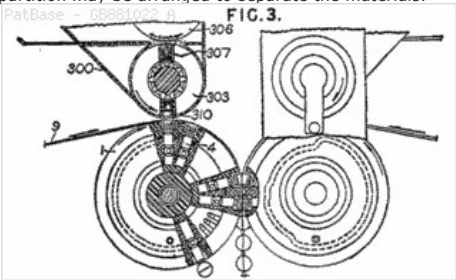
Inventor(s): (std): RAMBOLD ADOLF G F

Title: Improvements relating to methods and machines for forming and filling capsules of gelatine or like material

Abstract: Source: GB881022A 881,022. Machines for forming capsules. MEHTA, M. K., and MEHTA, M. July 23, 1958 [July 24, 1957], No. 23393/57. Class 94(1). A machine for forming capsules containing granular materials simultaneously produces and fills cavities in two webs which are then sealed together and severed along the peripheries of the cavities to produce the capsules. The webs 9 pass over heater drums 1 having staggered rows of apertures, the bases of which are closed by pistons 4. Above each drum is a hopper 300 for powder, containing a helical agitator 306 and having in its base a rotary feed member 303 with pockets 301 for receiving charges of the material. As each row of filled pockets and drum apertures comes into alignment, the pistons 4 recede inwards to draw the webs into the apertures, and cam operated plungers 306 discharge the material into the cavities so formed. Just prior to the webs being nipped between the drums, the pistons 4 begin to move radially outwards so as to remove air from the cavities prior to sealing and severing continued outward movement of the pistons after sealing insures ejection of any capsules adhering to the drums. Capsules remaining on the web are ejected by a pair of rollers, Fig. 1 (not shown), between which the web passes and which rotate in the opposite direction to its movement. Each hopper may feed a different power so as to produce a capsule containing two materials. According to the Provisional Specification, a partition may be arranged to separate the materials.

Classifications:

International (IPC 8-9): A61J3/07 (Advanced/Invention);
A61J3/07 (Core/Invention)
International (IPC 1-7): B65D88/54 B65G3/10 B65G65/48
CPC: A61J3/07
European: A61J3/07



Family:

Publication number	Publication date	Application number	Application date
GB881022 A	19611101	GB19570023393	19570724

Priority:

GB19570023393 19570724

Probable Assignee: MAHARAJ KRISHEN MEHTA

Assignee(s): (std): KANTA MEHTA ; MAHARAJ KRISHEN MEHTA

Title: PACKAGING APPARATUS AND TECHNIQUES

Abstract: Source: US3805486A Automatic packaging apparatus and methods for packaging food products such as bacon in evacuated or gas-filled packages. The disclosed machine is capable of convexly thermoforming two webs of packaging material into respective sets of pockets which are brought together in opposed positions to enclose the product. One preferred package made by the disclosed techniques comprises a transparent semi-rigid cup-like shell and a back-formed flexible film sealed over the shell opening. In operation of the disclosed machine, the product is loaded into the semi-rigid package shell from below, so that the upper sides of the product as introduced into the machine are pressed up against the inside surface of the shell, and after evacuation are held in that position by atmospheric pressure acting through the flexible film beneath the product. Thus, such upper sides of the product are visible through the transparent shell which serves as the display side of the package.

Classifications:

International (IPC 8-9): B29C51/22 B65B31/02 B65B31/04 B65B41/14

B65B9/04 (Advanced/Invention);

B65B31/02 B65B31/04 B65B41/00 B65B9/00 (Core/Invention)

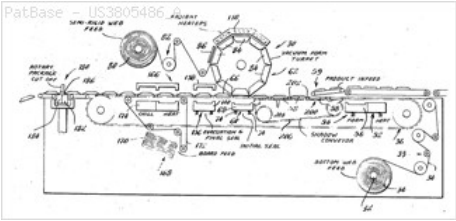
International (IPC 1-7): B65B31/02 B65B31/04 B65B35/56 B65B41/14 B65B41/18

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European: B29C51/22 B65B31/02C B65B41/14 B65B65/02 B65B9/04

US: 425/388 53/167 53/184 53/22A 53/427 53/433 53/450 53/453 53/511 53/555 53/559



Family:

Publication number	Publication date	Application number	Application date
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GB1435562 A	19760512	GB19730021149	19730503
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JP57005723 B4	19820201	JP19730061395	19730531
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US4034536 A	19770712	US19760745296	19761126

Priority:

US19720258320 19720531	CA19730167985 19730405	US19750579939 19750522
US19730427790 19731223	CA19760258796 19760810	US19760695022 19760611
US19760745296 19761126		

Probable Assignee: MAHAFFY AND HARDER ENG CO

Assignee(s): (std): MAHAFFY HARDER ENGINEERING CO ; MAHAFFY AND HARDER ENG CO ; MAHAFFY AND HARDER ENGINEERING

Assignee(s): MAHAFFY AND HARDER ENGINEERING CO ; MAHAFFY AND HARDER ENG CO US ; HAMILTON JOEL A ; MAHAFFY HARDER ENGINEERING CO US ; MAHAFFY AND HARDER ENGINEERING COMPANY ; MAHAFFY HARDER ENG CO ; MAHAFFY AND HARDER ENGINEERING CO TOTOWA N J V ST ; MAHAFFY AND HARDER ENGINEERING CO TOTOWA N J US ; MAHAFFY AND HARDER ENGINEERING CO TOTOWA N J V ST A ; PINNEY WESLEY W ; MAHAFFY REID A

Inventor(s): (std): HAMILTON JOEL A ; MAHAFFY REID A ; PINNEY WESLEY W ; PINNEY W ; MAHAFFY R ; HAMILTON J

Inventor(s): HAMILTON J US ; HAMILTON JOEL A ENGLEWOOD N J US ; HAMILTON JOEL A ENGLEWOOD ; MAHAFFY REID A MONTCLAIR N J US ; MAHAFFY REID A MONTCLAIR ; PINNEY WESLEY W UPPER MONTCLAIR ; PINNEY WESLEY W UPPER MONTCLAIR N J US ; PINNEY W US ; MAHAFFY R US

Title: MACHINE FOR THE MANUFACTURE OF FILLED AND SEALED CONTAINERS

Abstract: Source: US3918237A A machine for the manufacture of essentially boxlike packing containers wherein a first continuous web of a foldable material is drawn from a supply roll and folded to establish a series of connected U-shaped sections which are received in moulds, and wherein a second continuous web of a foldable material likewise drawn from a supply roll and folded into a U-shaped configuration is joined to the series of U-shaped sections established by the first web in such manner as to complete the wall structure of the container. Filling takes place prior to completion of sealing of the two webs to one another and thereafter the string of formed, filled and sealed containers are separated by a cutting action between the sections.

Classifications:

International (IPC 8-9): B29C53/00 B29C61/00 B29C65/08 B29D22/00 B31B17/00 B65B1/02 B65B43/10 B65B47/00 B65B61/18 B65B9/04 (Advanced/Invention);

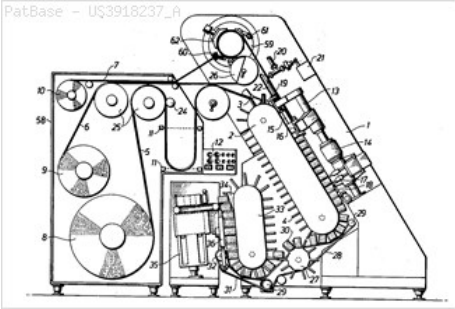
B29C65/74 (Advanced/Non-invention);
B29C53/00 B29C61/00 B29C65/08 B29D22/00 B31B17/00 B65B1/00 B65B43/00 B65B47/00 B65B61/18 B65B9/00 (Core/Invention);
B29C65/74 (Core/Non-invention)

International (IPC 1-7): B29C24/00 B29C65/08 B31B1/00 B31B1/26 B31B17/00 B31B3/26 B31B3/60 B65B1/02 B65B3/02 B65B43/00 B65B43/08 B65B43/10 B65B47/00 B65B47/04 B65B47/06 B65B51/10 B65B51/20 B65B57/00 B65B61/18 B65B9/02 B65B9/04 B65D75/28 B65D75/40

CPC: B29C66/81465 B29C65/086 B29C66/83511 B29C65/08 B29C65/7443 B29C66/83531 B29K2711/123 B29L2009/00 B31B17/00 B31B2217/086 B65B9/042 B65B43/10 B65B47/06 B29C66/83541 B29C66/73921 B29C66/849

European: B29C65/08 B29C66/83511 B29C66/83531 B31B17/00 B65B43/10 B65B47/06 B65B9/04B L29C65/7443 L29C66/81463 L29C66/83541 L29C66/849 L29K711/12B L29L9/00 L31B217/08D

US: 53/133 53/133.1 53/133.3 53/456 53/579



Family:

Publication number	Publication date	Application number	Application date
AR200758 A1	19741213	AR19740251991	19740118
AT347351 B	19781227	AT19740000429	19740118
AT42974 A	19780415	AT19740000429	19740118
AU197464563 A1	19750717	AU19740064563	19740116
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BR7400339 A0	19750826	BR19740000339	19740117
CA1001941 A1	19761221	CA19740190494	19740118
CH562130 A	19750530	CH19730000696	19730118
CS204979 B2	19810430	CS19740000341	19740118
DD108702 C	19741005	DD19740176068	19740117
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DE2402137 C3	19780622	DE19742402137	19740117
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ES422393 A1	19760416	ES19740422393	19740117
FI56345 B	19790928	FI19740000148	19740118
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FR2214585 A1	19740819	FR19740001574	19740117
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GB1454464 A	19761103	GB19740001323	19740111
GB1454465 A	19761103	GB19750051917	19740111
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GB1454468 A	19761103	GB19750051920	19740111
IE40497 B	19790620	IE19740000068	19740111
IE40497 L	19740718	IE19740000068	19740111
IN142495 A	19770723	IN1974CA02076	19740918
IT1009571 A	19761220	IT19740019585	19740118
JP1099598 C3	19820618	JP19740008466	19740118
JP50053192 A2	19750512	JP19740008466	19740118
JP56043926 B4	19811016	JP19740008466	19740118
KE2783 A	19771209	KE19770002783	19771019
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KE2787 A	19771209	KE19770002787	19771019
NL175278 B	19840516	NL19740000738	19740118
NL175278 C	19841016	NL19740000738	19740118
NL7400738 A	19740722	NL19740000738	19740118
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NO138522 C	19780920	NO19740000107	19740115
SE410787 B	19791105	SE19740000444	19740114
SE410787 C	19800214	SE19740000444	19740114
SU662000 D	19790505	SU19742000001	19740118
US3918237 A	19751111	US19740433789	19740116
YU12674 A	19820618	YU19740000126	19740117
YU37092 B	19840831	YU19740000126	19740117
ZA7400390 A	19741127	ZA19740000390	19740118

Priority:

CH19730000696 19730118

Probable Assignee: TETRA PAK AB

Assignee(s): (std): TERA PAK DEV S A ; TETRA PAK DEV SA ; TETRA PAK INT ; TETRA PAK INT A B ; TETRA PAK INT SA ; TETRA PAK INTERNATIONAL AB ; TETRA PAK INT AB ; TETRA PAK DEVELOPPEMENT SA ; TETRA PAK DEVELOPPEMENT SA CH ; TETRA PAK DEVEOOPMENT ; TETRA PAK DEV ; TETRA PAK INTERNAT A B ; TETRA PAK INTERNATIONAL AKTIEBOLAG TE LUND ZWEDEN ; TETRA PAK INTERNATIONAL SA ; TETRA PAK INTERNEJSHNL AB FA

Assignee(s): TETRA PAK INTERNATIONAL AB LUND SCHWEDEN ; TETRA PAK INTERNEJSHNL AB FIRMA ; TETRA PAK INTERNEJSHNL AB ; TETRA PAK DEVELOPPEMENT CH SA ; TETRA PAK INTERNATIONAL A B ; TETRA PAK INT AKTIEBOLAG TE LUND ZWEDEN ; TETRA PAK DEVELOPPEMENT S A LAUSANNE SCHWEIZ ; TETRA PAK INT AB LUND SCHWEDEN ; TETRA PAK DEVELOPPEMENT S A LAUSANNE ; TETRA PAK INT LUND AB ; TETRA PAK DEVELOPPEMENTS ; TETRA PAK AB ; TETRA PAK DEVELOPPEMENT S A ; TERA PAK DEVELOPPEMENT S A ; TETRA PAK DEVELOPMENT AB ; TETRA PAK DEVELOPMENT SA ; OLSEN JAN ERIK ; SOUKUP FRANZ ; STARK SVEN OS

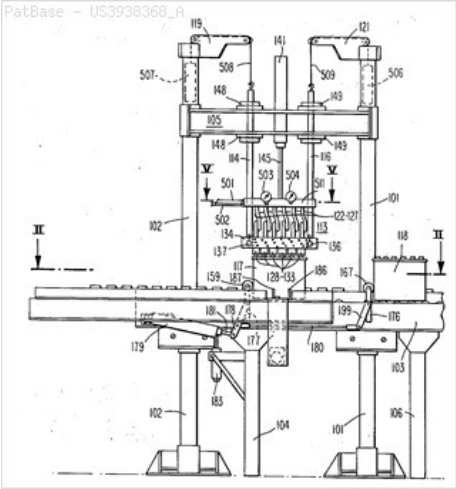
Inventor(s): (std): F SOUKUP ; FRANTS SUKUP SW ; FRANZ SOUKUP ; J E OLSEN ; JAN ERIK OLSEN ; OLSEN J ; OLSEN J E ; OLSEN JAN ERIK ; OLSEN JE ; OLSEN ZHAN ERIK ; S O S STARK ; SOEREN S ; SOEREN STARK SVEN OLOF ; SOUKUP F ; SOUKUP FRANZ ; STARK S ; STARK S O S ; STARK SOS ; STARK SVEN LOLF SOREN ; STARK SVEN O S ; STARK SVEN OLOF SEREN ; STARK SVEN OLOF SOEREN ; STARK SVEN OLOF SOREN ; STARK SVEN OS ; SUKUP FRANTS ; SVEN LOLF SOREN STARK ; SVEN OLOF SEREN STARK SW ; ZHAN ERIK OLSEN SW

Inventor(s): SVEN OLOF SOEREN STARK ; STARK SVEN OLOF SOEREN RYDSGARD ; SOUKUP FRANZ CH ; SOUKUP FRANZ MALMOE ; OLSEN JAN ERIK CH ; OLSEN JAN ERIK LUND

Title: Automatic air leak testing apparatus

Abstract: Source: US3938368A Batteries are moved along a first roller type conveyor to a leak testing station, above which is located an assembly having a plurality of nozzles matable over battery cell inlets. A first set of alternate cells is supplied with air at a given pressure, and metering means notes pressure change. Thereupon, the remaining alternate cells receive the same treatment. If the cells do not leak, the battery advances from the testing station along the roller conveyor. If a leak is detected, a push bar connected to cable means below the rollers ejects the battery transversely from the testing station along to a second conveyor, thereby isolating leaky batteries either for removal or further testing to locate more precisely the leak.

Classifications:
International (IPC 8-9): B22D25/04 B22D39/00 B65G47/248 G01M3/32 H01M10/04 H01M10/12 H01M10/42 H01M2/00 H01M2/02 H01M2/12 H01M2/22 H01M2/28 H01M2/36 (Advanced/Invention); H01M10/42 (Advanced/Non-invention); B22D25/00 B22D39/00 B65G47/24 G01M3/32 H01M10/04 H01M10/06 H01M10/42 H01M2/00 H01M2/02 H01M2/12 H01M2/22 H01M2/26 (Core/Invention); H01M10/42 (Core/Non-invention)
International (IPC 1-7): B07C9/00 B22D19/04 B22D39/00 B22D39/02 B22D41/04 B65D87/24 B65G21/20 B65G47/00 B65G47/22 B65G47/24 B65G47/74 B65G49/00 B65G65/02 B65G65/04 B65G65/30 B65G65/34 B65G65/38 G01M3/26 H01M10/04 H01M10/12 H01M10/42 H01M2/00 H01M2/22 H01M2/36 H01M47/00
CPC: Y02E60/126 Y10S209/934 Y10S164/01 G01M3/3236 H01M2/0242 H01M10/4228 H01M10/4285 H01M10/0404 B22D39/00 H01M2/28 B65G47/248 H01M2/22 B22D25/04 H01M2/364
European: B22D25/04 B22D39/00 B65G47/248 G01M3/32D H01M10/04A H01M10/42T H01M2/02C4 H01M2/22 H01M2/28 H01M2/36D T01M10/42L Y02E60/12 Y02E60/12F
US: 164/108 164/109 164/135 164/136 164/333 164/334 164/337 164/342 164/DIG.1 198/341.07 198/345 198/345.1 198/346.2 198/791 198/860.2 198/861 209/552 209/651 209/653 209/74R 209/934 214/314 222/252 222/271 222/318 222/330 222/367 222/478 294/119.3 414/415 414/421 73/45.1 73/45.2 73/49.2



Family:

Publication number	Publication date	Application number	Application date
AR214994 A1	19790831	AR19770266858	19770315
AT184277 A	19790915	AT19770001842	19770317
AT356195 B	19800410	AT19770001842	19770317
AU197723045 A1	19780914	AU19770023045	19770309
AU508487 B2	19800320	AU19770023045	19770309
BE852671 A1	19770919	BE19771008029	19770318
BG29438 D	19801114	BG19770035761	19770322
BR7701721 A	19780208	BR19770001721	19770318
CA1072485 A1	19800226	CA19770274393	19770321
CA1095982 A1	19810217	CA19770292568	19771207
CA1096444 A1	19810224	CA19780295269	19780119
CA1101184 A1	19810519	CA19800353615	19800609
CA1106791 A1	19810811	CA19790330115	19790619
CA1125850 A1	19820615	CA19780315668	19781031
DE2711532 A1	19771006	DE19772711532	19770314
FR2345817 A1	19771021	FR19770008526	19770322
FR2345817 B1	19810828	FR19770008526	19770322
GB1536981 A	19781229	GB19770009248	19770303
IN147802 A	19800705	IN1977CA00352	19770309
IT1072707 A	19850410	IT19770067613	19770321
JP52122840 A2	19771015	JP19770030548	19770322
MX144904 A	19811202	MX19770168367	19770315
NL7703114 A	19770926	NL19770003114	19770322
PL113791 B1	19801231	PL19770196797	19770321
RO70662 P	19810730	RO19770089758	19770322
SE7702268 A	19770923	SE19770002268D	19770301
SE7702268 L	19770923	SE19770002268	19770301
SU659109 D	19790425	SU19772469051	19770321
SU659109 T	19790425	SU19772469051	19770321
US3938368 A	19760217	US19740475273	19740531
US4010840 A	19770308	US19750605271	19750818
US4027797 A	19770607	US19750600840	19750731
US4081093 A	19780328	US19760669216	19760322
US4099404 A	19780711	US19760692165	19760602
US4109793 A	19780829	US19770770889	19770222
US4203699 A	19800520	US19780866515	19780103
US4221523 A	19800909	US19780919490	19780627
US4225037 A	19800930	US19780894349	19780407
US4230241 A	19801028	US19790017868	19790305
US4241780 A	19801230	US19760752644	19761220
US4310280 A	19820112	US19790077777	19790921
US4341256 A	19820727	US19800173481	19800730
YU74177 A	19820630	YU19770000741	19770321
ZA7701376 A	19780125	ZA19770001376	19770308

Priority:
US19740475273 19740531 US19750600840 19750731 US19750605271 19750818
US19760692165 19760602 US19760752644 19761220 US19760669216 19760322
US19770770889 19770222 US19780866515 19780103 CA19770292568 19771207
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US19780919490 19780627 US19780894349 19780407 CA19780295269 19780119
CA19780315668 19781031 CA19800353615 19800609 CA19790330115 19790619

Probable Assignee: GEN BATTERY CORP
Assignee(s): (std): GEN BATTERY CORP ; GENERAL BATTERY CO US ; GENERAL BATTERY TE READING PENNSYLVANI CORP ; DZHENERAL BETTERI CORP FA ; GEN BATTERY CO ; JIENERARU BATSUTERI CORP
Assignee(s): GENERAL BATTERY TE READING PENNSYLVANIE VER ST V AM CORP ; GENERAL BATTERY CORP ; GENERAL BATTERY CORP US ; EBERLE WILLIAM J ; DZHENERAL BETTERI CORP FIRMA ; GENERAL BATTERY CO ; BANKERS TRUST CO ; CHEMICAL

BANK A NY BANKING CORP ; CITICORP INDUSTRIAL CREDIT INC ; CITICORP INDUSTRIAL CREDIT INC 725 SOUTH FIGUEROA ; CITICORP INDUSTRIAL CREDIT INC 725 SOUTH FIGUEROA STREET LOS ANGELES CALIFORNIA 90017

Inventor(s): (std): EBERLE ; EBERLE J W ; EBERLE W J ; EBERLE WILLIAM JACOB ; EBERLI UILYAM DZHEKOB ; WJ EBERLE ; WILLIAM JACOB EBERLE ; W J EBERLE ; UIRIAMU EICHI FUARON ; UIRIAMU AARU SUKOBAA ; UILYAM DZHEKOB EBERLI US ; EBERLE WILLIAM J ; EBERLE WILLIAM I ; EBERLE W ; EBERLE JW

Inventor(s): JACOB EBERLE WILLIAM

Agent(s): KIRBY EADES GALE BAKER

Title: Sealed packages for spreadable products

Abstract: Source: US4369885A A sealed package particularly adapted for storing, shipping, handling and for supporting for use after the cover is peeled off, an individual portion of a spreadable product such as butter, margarine, peanut butter and the like. The package is comprised of a relatively flat, relatively stiff base member which is generally rectangularly shaped having the spreadable product adhering to the center portion of the base member and a top member or cover made from a flexible sheet into a shape having a center portion generally co-extensive with the top surface of the spreadable product and downwardly and outwardly extending edges pleated to form peel tabs, said top member being cohesively attached to the base member at the outwardly extending edges so as to fully enclose the spreadable product on the base member with such peel tabs extending beyond the base. The top member is attached to the base member so that it can be peeled from the base member and spreadable product by pulling a peel tab to expose such product on the base member so that such amounts of the product, as required by the user, can be removed from the base with a knife or the like as such product is being used.

Classifications:

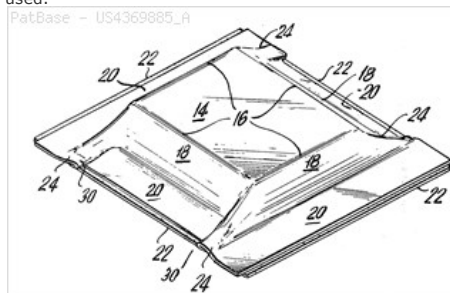
International (IPC 8-9): B65B11/50 B65B25/06 B65B47/00 B65B63/02 B65D65/32 B65D75/30 B65D85/74 (Advanced/Invention); B65B11/50 B65B25/00 B65B47/00 B65B63/00 B65D65/22 B65D75/28 B65D85/72 (Core/Invention)

International (IPC 1-7): B29C24/00 B65B11/50 B65B11/54 B65B25/06 B65B25/08 B65B25/10 B65B3/02 B65B47/00 B65B47/06 B65B47/10 B65B5/04 B65B51/02 B65B61/18 B65B61/24 B65B63/02 B65D65/02 B65D65/14 B65D65/32 B65D75/30 B65D75/36 B65D75/64 B65D85/00 B65D85/72 B65D85/74 B65D85/76

CPC: B65D75/30 B65B11/50 B65D85/74

European: B65B11/50 B65D75/30 B65D85/74

US: 206/461 206/484 206/525 206/633 229/245 229/87R 426/130 493/163 493/173 493/250 53/133 53/133.3 53/412 53/453 53/456 53/559 53/579

**Family:**

Publication number	Publication date	Application number	Application date
AR224421 A1	19811130	AR19800282677	19800926
AU198062770 A1	19810409	AU19800062770	19800926
AU535482 B2	19840322	AU19800062770	19800926
BE885346 A1	19810116	BE19800202197	19800923
BR8006105 A	19810407	BR19800006105	19800924
CA1155045 A1	19831011	CA19820409893	19820820
CA1155045 A2	19831011	CA19820409893	19820820
CA1156981 A1	19831115	CA19800361060	19800925
CH639343 A	19831115	CH19800007054	19800919
CS238607 B2	19851216	CS19800006575	19800929
DD153791 A5	19820203	DD19800224150	19800926
DE3036435 A1	19810416	DE19803036435	19800926
DK408480 A	19810329	DK19800004084	19800926
ES253194 U	19810901	ES19800253194U	19800929
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ES495402 A1	19811116	ES19800495402	19800926
ES8200841 A1	19820216	ES19800495402	19800926
FI71100 B	19860814	FI19800002867	19800912
FI71100 C	19861124	FI19800002867	19800912
FI802867 A	19810329	FI19800002867	19800912
FR2466407 A1	19810410	FR19800020355	19800922
FR2466407 B1	19850222	FR19800020355	19800922
GB2058708 A1	19810415	GB19800030682	19800923
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GB2133373 A1	19840725	GB19820036173	19821220
GB2133373 B2	19850206	GB19820036173	19821220
GB2133765 A1	19840801	GB19820036192	19821220
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GR70215 B	19820831	GR19800162982	19800927
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IE50119 B	19860219	IE19800001894	19800910
IE801894 L	19810328	IE19800001894	19800910
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JP62168871 A2	19870725	JP19860236980	19861003
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LU82805 A	19801215	LU19800082805	19800926
MX151494 A	19841204	MX19800184103	19800926
NL8005371 A	19810331	NL19800005371	19800926
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PL132144 B1	19850228	PL19800226950	19800927
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US4449350 A	19840522	US19820416400	19820909
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YU185683 A	19850430	YU19830001856	19830914

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Priority:

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Probable Assignee: SANFORD REDMOND TE NEW YORK

Assignee(s): (std): REDMOND S ; REDMOND SANFORD ; REDMOND SANFORD US ; REIMOND SANFORD ; REIMOND SANFORD US ; SANFORD REDMOND ; SANFORD REDMOND TE NEW YORK ; SANFUOODO RETSUDOMONDO

Inventor(s): (std): REDMOND S ; REDMOND SANFORD ; REDMOND SANFORD US ; REIMOND SANFORD ; REIMOND SANFORD US ; SANFORD REDMOND ; SANFUOODO RETSUDOMONDO

Agent(s): MACRAE AND CO; EITAN PEARL LATZER AND COHEN ZEDEK

EERDEN HENRICUS FRANCISCUS JM ; VAN DEN NIEUWELAAR ADRIANUS ; JANSSEN PETRUS CM ; JANSSEN PETRUS CHRISTIANUS HENDRIKUS ; JANSSEN PETRUS CHRISTIANUS ; VAN DE EERDEN HENRICUS FRANCISCUS ; VAN DE EERDEN HENRICUS FRANCISCUS J M ; VAN DE EERDEN HENRICUS FRANCISCUS JAC ; JANSSEN PETRUS

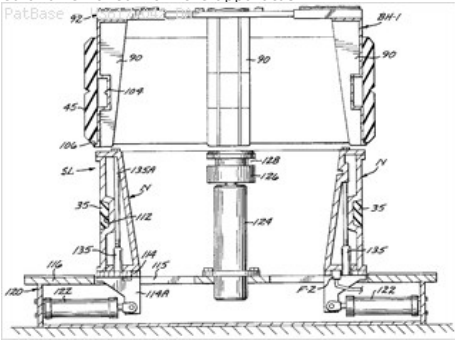
Agent(s): BROOKHUIS HENDRIK JAN ARNOLD; EP AND C; JOHN S PRATT ESQ KILPATRICK STOCKTON LLP; KILPATRICK STOCKTON LLP; KILPATRICK TOWNSEND AND STOCKTON LLP

Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT JP LI LU MC NL PT SE US

Title: Method and apparatus for making integral rubber tractor tracks

Abstract: Source: US6177042B Method and apparatus for molding an endless tractor track from an uncured belt and a plurality of drive lugs wherein the lugs are pressed onto the inner periphery of the belt, the belt and lugs are positioned in a mold to be cured and molded together while treads are formed on the outer periphery of the belt, and the completed belt is cooled and removed from the apparatus.

Classifications:
International (IPC 8-9): B29C35/02 B29C43/00 B29C43/02 B29D29/08 B29D99/00 B60C7/28 B62D55/253 B62D55/32 (Advanced/Invention); B29C43/00 B29K105/22 B29K21/00 (Advanced/Non-invention); B29C35/02 B29C43/02 B29D29/00 B29D99/00 B60C7/00 B62D55/00 B62D55/24 (Core/Invention); B29C43/00 (Core/Non-invention)
International (IPC 1-7): B29C35/00 B29C43/02 B29D29/00 B29D29/08 B29D31/00 B29K105/10 B29K105/22 B29K21/00 B60C7/28 B62D55/253 B62D55/32
CPC: B29C43/00 B29D29/085 B29K2021/00 B29K2105/101
European: B29D29/08B L29C43/00 L29K105/10B L29K21/00
US: 156/137 156/140 156/141 264/326 264/334 425/34.2 425/342 425/384 425/395



Family:

Publication number	Publication date	Application number	Application date
AU199961632 A1	20000613	AU19990061632	19990924
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AU755431 B2	20021212	AU19990061632	19990924
BRPI9915511 A	20010807	BR1999PI15511	19990924
CA2351362 AA	20010522	CA19992351362	19990924
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CO5021139 A1	20010327	CO19990072514	19991118
DE69904078 D1	20030102	DE19996004078	19990924
DE69904078 T2	20030731	DE19996004078T	19990924
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EP1135248 B1	20021120	EP19990948463	19990924
JP2002530234 T2	20020917	JP20000583695T	19990924
MXPA01005105 A1	20020604	MX2001PA05105	19990924
TH40528 A	20000928	TH19991003730	19991005
US6177042 BA	20010123	US19980198556	19981123
WO0030837 A1	20000602	WO1999US22280	19990924

Priority:
US19980198556 19981123 US19980198556 19981123 WO1999US22280 19990924

Probable Assignee: GOODYEAR TIRE AND RUBBER CO

Assignee(s): (std): GOODYEAR TIRE AND RUBBER

Assignee(s): GOODYEAR TIRE AND RUBBER CO ; JPMORGAN CHASE BANK ; WILMINGTON TRUST CO ; JPMORGAN CHASE BANK AS COLLATERAL AGENT ; JPMORGAN CHASE BANK NA ; THE GOODYEAR TIRE AND RUBBER COMPANY ; VEYANCE TECHNOLOGIES INC ; THE GOODYEAR TIRE AND RUBBER CO ; LEHMAN COMMERCIAL PAPER INC ; LEHMAN COMMERCIAL PAPER INC COLLATERAL AGENT AS ; JPMORGAN CHASE BANK COLLATERAL AGENT AS ; WILMINGTON TRUST CO COLLATERAL AGENT AS ; THE GOODYEAR TIRE AND RUBBER CO AKRON ; DEUTSCHE BANK TRUST CO ; DEUTSCHE BANK TRUST CO AMERICAS COLLATERAL AGENT A ; FIKE LOUIS T

Inventor(s): (std): FIKE LOUIS T ; FIKE T ; FIKE LOUIS THOMAS

Inventor(s): LOUIS T FIKE ; LOUIS THOMAS FIKE

Agent(s): SPRUSON AND FERGUSON; ASPEN PHARMA PTY LTD; SIM AND MCBURNEY; JOSE ANTONIO LLOREDA

Designated states: AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CY CZ DE DK EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG UZ VN YU ZW

Title: TREATMENT OF ANIMAL LITTER WITH FERRIC SULFATE GRANULES

Abstract: Source: US2008173248A Methods of treating animal litter and/or bedding material for control of volatile ammonia and soluble phosphorous include applying granular partially hydrated ferric sulfate to the litter. The partially hydrated ferric sulfate ranges from gray to tan in color and is spread onto the litter at a rate effective to reduce ammonia volatilization and reduce soluble phosphorous. Relative to reagent grade ferric sulfate, the partially hydrated ferric sulfate exhibits lower hygroscopicity and higher deliquescence. The ferric sulfate is prepared by a process comprising oxidizing ferrous sulfate with sulfuric acid using a molecular oxygen oxidizing agent at an elevated pressure relative to atmospheric and at a temperature of 60 degrees centigrade to 140 degrees centigrade to produce a gray to tan colored granular product.

Classifications:

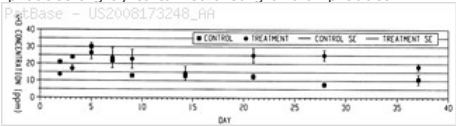
International (IPC 8-9): A01K1/00 A01K1/015 A22C7/00 A61L11/00 A61L9/012 B28B13/02 B28B17/00 B29C45/03 B29C45/40 B29C47/92 B65G33/08 (Advanced/Invention);

A01K1/00 B28B13/00 B29C45/03 B29C45/40 B65G33/08 (Core/Invention)

CPC: A22C7/0084 A22C7/0038 A23P1/105 A01K1/0152

European: A01K1/015B A22C7/00D2 A22C7/00D2B A22C7/00D2F A22C7/00D2F2 A23P1/10B

US: 119/171 198/463.1 198/463.100S 198/467.1 198/467.100P 424/400 424/400P 424/489 424/647 424/709 424/76.5 424/76.6 424/76.600S 424/76.8 424/76.9 425/110 425/110S 425/135 425/135P 425/144 425/144P 425/145 425/185 425/188 425/188S 425/190 425/190S 425/192.00R 425/192R 425/236 425/256 425/556 425/556S 425/572 425/587 426/513 71/15 71/63



Family:

Publication number	Publication date	Application number	Application date	
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US2008230351 AA	20080925	US20080018778	20080123	
US2008233226 AA	20080925	US20080018781	20080123	
US2008233228 AA	20080925	US20080018722	20080123	
US2012058159 AA	20120308	US20110291326	20111108	
US7775790 BB	20100817	US20080018722	20080123	
US8011914 BB	20110906	US20080018778	20080123	
US8075876 BB	20111213	US20080018499	20080123	
US8986666 BB	20150324	US20110291326	20111108	
USRE44744 E	20140204	US20120587675	20120816	

Priority:

US20070881877P 20070123	US20070881887P 20070123	US20080018499 20080123
US20080018778 20080123	US20080018781 20080123	US20080018722 20080123
US20110291326 20111108	US20120587675 20120816	

Probable Assignee: KEMIRA WATER SOLUTIONS INC

Assignee(s): (std): FORMAX INC ; JOHNSON VICTOR ; KEMIRA WATER SOLUTIONS INC ; LINDEE SCOTT A ; SANDBERG GLENN ; TAYLOR PAUL ; PAVLICEK JAN J

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