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ESCOBAR-URIBE ASOCIADOS
Intellectual Property

As. 2978/P.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES
E. S. D.

Ref.: Expediente No. **06-051.497**
Solicitud de Patente a nombre de
Ethicon, Inc.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. **06-051497-00002-0000**

Fecha: 2008-01-22 16:06:56 Dep. 2020 NUECREACIONE
Tps: 2 PATENTES Evt: 1 REGDEPOSITO
Art. 539 PETICION Folios: 4

Yo, **JIMENA ESCOBAR URIBE**, identificada como aparece al pie de mi firma, domiciliada en Bogotá, en la Carrera 11 No. 86-53, piso 6, obrando como apoderada de la sociedad **Ethicon, Inc.**, con domicilio en Somerville, New Jersey, Estados Unidos de América, solicitante de la patente de la referencia, pido a usted que se proceda a examinar si la invención, cuya patente se tramita en el expediente de la referencia, es patentable.

Adjunto al presente memorial los recibos Nos. 08 - 1,955 // 08 - 1,964 y 08 - 1,973 de 8 de enero de 2008, por la suma de \$420.000.00, con lo cual queda cubierta la tasa oficial correspondiente a dicho estudio.

Señor Superintendente,


JIMENA ESCOBAR URIBE
C.C.39.779.452 de Usaquén
T.P. 68.228

SECRET

SECRETARIA DE ECONOMIA Y COMERCIO
DIRECCION DE REGISTRO Y CLASIFICACION

Por el presente se hace saber a todos los señores interesados en el presente asunto que se ha acordado lo siguiente:

1. Se ha acordado que se continúe con el procedimiento de registro y clasificación de los documentos que se presenten a la Dirección de Registro y Clasificación, de acuerdo con lo establecido en el Reglamento de la Ley de Registro y Clasificación.

2. Se ha acordado que se continúe con el procedimiento de registro y clasificación de los documentos que se presenten a la Dirección de Registro y Clasificación, de acuerdo con lo establecido en el Reglamento de la Ley de Registro y Clasificación.

SECRETARIA DE ECONOMIA Y COMERCIO
DIRECCION DE REGISTRO Y CLASIFICACION

El problema planteado en esta solicitud es satisfacer la necesidad de suministrar un conector que evita el cierre cuando se incrementa la presión sobre un nivel predeterminado.

Para solucionar este problema técnico la solicitud en estudio proporciona un conector elástico que tiene medios de retención sobre el extremo de un conducto que se inserta dentro del conector y está diseñado para que, cuando se exceda una presión determinada, permita el flujo por el exterior de dicho extremo, evitando así que se bloquee el flujo.

Clasificación Internacional de Patentes (IPC): A61B 1/12, 1/00, F16L 33/16

3. De la solicitud de Patente

Descripción (artículo 28 D. 486)

Antes de entrar en detalles específicos, se le dan al solicitante ciertas indicaciones generales, algunas de las cuales son aplicables a este caso y todas deberán ser tenidas en cuenta en las eventuales modificaciones:

El título o nombre de la invención debe concordar con lo que se reclama en el capítulo reivindicatorio. Esto es, si en las reivindicaciones se reclama un producto, tal producto debe ser mencionado en el título, y si en las reivindicaciones se reclama un procedimiento o un sistema o un método, también debe ser mencionado allí. Normalmente, el título debe contener máximo diez palabras aunque eventualmente pueden ser más.

En Colombia, la máxima autoridad en cuestiones del lenguaje es la Academia Colombiana de la Lengua. En caso de duda sobre el significado de las palabras, se debe acoger la definición que trae el Diccionario de la Real Academia Española (DRAE).

En Colombia, es de uso obligatorio el Sistema Internacional de unidades. Esto implica, también, que la coma decimal es de uso obligatorio. Cuando aparezca algún valor con unidades diferentes a las exigidas, deberá incluirse su correspondiente conversión al Sistema Internacional.

La parte técnica de la solicitud se divide en tres secciones, debidamente separadas, preferiblemente en este orden: Capítulo descriptivo, capítulo reivindicatorio y dibujos o figuras. Ninguna de estas secciones podrá llevar membretes (encabezamientos o pies de página) ajenos al contenido técnico de la solicitud.

Por lo menos el capítulo descriptivo debe estar debidamente paginado y estar escrito a doble espacio, con el fin de facilitar la referencia a los apartados del texto. La terminología empleada en la descripción y en las reivindicaciones debe ser igual para designar las diferentes partes, piezas, elementos, detalles o aspectos de lo que se mencione en ellas; los cuales, a su vez, deben estar designados con números o signos de referencia.

Dentro del texto de la descripción y las reivindicaciones se aconseja encerrar entre paréntesis el número o signo de referencia cada vez que se mencione el detalle correspondiente, con el fin de distinguirlo de otros tipos de números o signos que eventualmente aparezcan allí.

Las reivindicaciones deben estar numeradas individual y consecutivamente (1, 2, ... 5, 6, etc.) El capítulo reivindicatorio no debe tener subtítulos.

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Normalmente se pueden encontrar dos categorías de reivindicaciones: una, la de producto y la otra, de procedimiento.

En las reivindicaciones se deben definir los alcances de la protección que desea el solicitante. En consecuencia, las reivindicaciones forman un cuerpo aparte de la descripción y como tal debe ser redactado: la primera vez que se mencione un nombre dentro de las reivindicaciones debería estar acompañado de un artículo indeterminado; y, la inclusión -entre paréntesis- de un número de referencia no sustituye la definición del elemento o aspecto al que se refiere, simplemente sirve de información complementaria. Se debe entender que la descripción sirve para interpretar las reivindicaciones y, en consecuencia, si en una reivindicación se reclama un aparato, por ejemplo, no se deberían mencionar aspectos del funcionamiento del aparato dentro de la reivindicación, limitándose a definir únicamente los elementos que constituyen el aparato.

Cada una de las figuras debe estar debidamente identificada, preferiblemente con un número consecutivo: Figura 1, figura 2, ...

Las figuras deben ser realizadas siguiendo las reglas del dibujo técnico.

Se prefiere que dentro de las figuras no se incluya ningún texto. Cada uno de los detalles ilustrados en las figuras deberá estar señalado con un número o signo de referencia, el cual será el mismo en todas las figuras en donde se encuentre el detalle en cuestión.

La patente de **modelo de utilidad** no puede incluir los procedimientos, por definición. Si alguna de las reivindicaciones de una solicitud de patente de modelo de utilidad reclama un procedimiento, debe ser suprimida.

Durante el análisis del texto de la descripción y de las ilustraciones anexadas, se observaron los siguientes defectos:

- 1) En el título o nombre de la invención no se menciona el método que se reclama en las reivindicaciones 10 a 18.
- 2) El solicitante debe aclarar el término *reprocesador(es)* que aparece por primera vez en el título, pues no se entiende el alcance de este calificativo.
- 3) En la página 1, folio 7, aparece por primera vez el término *lúmenes* cuyo significado (plural de una unidad de medida: *lumen*) según el Diccionario de la Real Academia Española (DRAE), no concuerda con el contexto.
- 4) En la página 2, folio 8, aparece la expresión *requiere que estas superficies sean manualmente limpiadas y talladas con fluido de esterilización* en la cual el término *talladas* no concuerda con el contexto.
- 5) En la misma página 2 aparecen varias expresiones numéricas en las cuales se hace mal uso de la coma (por ejemplo: 6,041,794).
- 6) En la misma página 2 aparece la expresión *para acoplarse con un puerto conectado al lumen en el lumen* en donde, además de objetar el término *lumen* se objeta el sentido de la expresión, porque no es claro.
- 7) En la página 4, folio 10, aparece por primera vez una expresión numérica (0.84 kg/cm²) en la cual se omite emplear la coma decimal -que es de uso obligatorio en Colombia-.
- 8) En la figura 2, folio 51, aparecen ilustradas dos figuras separadas, sin relación gráfica entre sí y sin denominación individual.
- 9) En la página 8, folio 14, aparece la expresión *La figura muestra un aparato...* en donde se debe aclarar a qué figura -de las once con denominación propia- se refiere.
- 10) En la misma página 8 aparece por primera vez una expresión en donde se incluye una sigla (HEPA) sin que esté acompañada de su correspondiente significado.

NO. 73-107-1057-1058

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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Journal of Management Studies, 19(6), 701-718.

THE UNIVERSITY OF CHICAGO

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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 3. The third step is to analyze the problem.
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 7. The seventh step is to monitor the solution.
 8. The eighth step is to maintain the solution.
 9. The ninth step is to improve the solution.
 10. The tenth step is to document the solution.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

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the 1990s, the number of people in the United States who are 65 years of age or older is projected to increase from 20 million to 30 million, and the number of people 75 years of age or older is projected to increase from 10 million to 15 million (U.S. Census Bureau, 1996).

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the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.2 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 250 million to 450 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

- 11) En las páginas 8 y 9, folios 14 y 15, aparece la expresión *Un despliegue visual* 22 cuyo significado no corresponde al contexto.
- 12) En la página 10, folio 16, aparece por primera vez la expresión *tanque de ruptura* 56 que requiere una explicación.
- 13) En la página 13, folio 19, aparece por primera vez la expresión *presuriza*, derivada del verbo *presurizar*, el cual, según el DRAE, significa (Del ingl. *to pressurize*).

1. tr. *Mantener la presión atmosférica normal en un recinto, independientemente de la presión exterior, como en la cabina de pasajeros de un avión.*

Significado que no concuerda con el contexto. El solicitante deberá sustituir este término -y sus derivados: *presurización, sobrepresurización* que aparecen en diversos sitios de la solicitud- por una expresión que se ajuste a lo que desea divulgar.

- 14) En la página 14, folio 20, aparece la expresión *La velocidad de flujo de la bomba (32) y su porcentaje en tiempo proveen una indicación...* que carece de significado.

- 15) En la página 16, folio 22, aparece la expresión *el conector del conductor de luz* cuyo significado es ajeno al contexto.

- 16) En la página 19, folio 25, aparece la expresión *una superficie externa (318)* en la cual se menciona un número de referencia que no se encuentra en ninguna figura. Un defecto similar ocurre con el número de referencia (322) de la expresión *conector (322)* que aparece en la misma página. Incidentalmente, se sugiere que los números de referencia aparezcan encerrados entre paréntesis para evitar confundirlos con otro tipo de números que eventualmente aparecen en la solicitud.

- 17) En la página 20, folio 26, aparece por primera vez la expresión *una lengüeta de manguera (340)* cuyo significado no corresponde a lo ilustrado como tampoco corresponde al contexto.

- 18) En la página 22, folio 28, se menciona tres veces un *sello 308*. Pero en la página 18, folio 24 se había definido 308 como *los pasadores 308*. Se debe hacer la aclaración respectiva.

- 19) En la figura 11, folio 57, se muestra una flecha, en la parte superior, que no tiene su correspondiente número de referencia.

- 20) En la página 25, folio 31, aparece por primera vez la sigla *ID*, cuyo significado no se encuentra adyacente.

- 21) En la misma página 25 aparece la expresión *y/o*. Al respecto, el *Diccionario panhispánico de dudas* de la Real Academia Española y de la Asociación de Academias de la Lengua Española, primera edición, octubre de 2005, página 681, dice:

y/o: Hoy es frecuente el empleo conjunto de las conjunciones copulativa y disyuntiva separadas por una barra oblicua, calco del inglés «and/or», con la intención de hacer explícita la posibilidad de elegir entre la suma o la alternativa de dos opciones: «Se necesitan traductores de inglés y/o francés». Se olvida que la conjunción 'o' puede expresar en español ambos valores conjuntamente.

El examinador ha subrayado la última frase porque es particularmente aplicable a este caso.

- 22) En la página 26, folio 32, aparecen varios valores de presión en unidades diferentes a las del Sistema Internacional.

- 23) En la página 35, folio 41, aparece la expresión *0.2 μ* en la cual, por una parte, se omitió usar la coma decimal; y, por otra parte, faltan las unidades, sólo está el prefijo: μ (micro).

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- La descripción no cumple con los requisitos de claridad y divulgación completa, lo que dificulta o impide su comprensión y ejecución de acuerdo al Art. 28 de la Decisión 486

Reivindicaciones (artículo 30 D 486)

Durante el análisis del texto de las reivindicaciones se observaron los siguientes defectos:

- 1) En la reivindicación 1, folio 45, aparece por primera vez en el capítulo reivindicatorio el término *lumen* que fue objetado arriba, con relación a la descripción.
- 2) En las reivindicaciones 8, 9 y 16, folios 47 y 49, aparecen valores numéricos en los cuales se omite emplear la coma decimal -de uso obligatorio en Colombia-.
- 3) En la reivindicación 12, folio 48, se reclama *el método de conformidad con la reivindicación 11, caracterizado además porque la porción de sellado se desvía hacia la primera posición* pero, en la reivindicación 11 no se menciona la *porción de sellado* cosa que sí se hace en la reivindicación 10, por lo que la reivindicación 12 debería depender de la 10, no de la 11.
- 4) En la reivindicación 18, folio 49, se reclama un *método... caracterizado además porque el primer flujo comprende un fluido...* pero, como lo que se define aquí es un producto, no una etapa de un método, no se puede caracterizar el método por este producto; se sugiere sustituir la expresión objetada por *método... donde el primer flujo comprende un fluido...* (se subraya el término que reemplaza a la parte objetada).

- Debe entenderse que las reivindicaciones dependientes de las reivindicaciones objetadas son, asimismo, objetadas, por razones análogas.
- Las reivindicaciones no cumplen con los requisitos de definición y claridad, de acuerdo al Art. 30 de la Decisión 486.

Se deben presentar, entonces, nuevos capítulos descriptivo y reivindicatorio, ambos completos, junto con un nuevo juego de dibujos, donde se hayan corregido todas las objeciones que se han hecho arriba. Esto con el fin de evitar -cuando solo se presentan algunas páginas sueltas corregidas- que el lector tenga que desplazarse desde un sitio a otro de la solicitud y luego regresar a donde estaba antes sin perder la ilación de la lectura, porque esto produce confusión y afecta negativamente la claridad de dichos capítulos.

Se le advierte al interesado que las modificaciones sugeridas arriba podrían resultar inconducentes si se mantienen las objeciones a la patentabilidad que se insinúan adelante.

4. Determinación del Estado de la Técnica

- La fecha que se ha tenido en cuenta para determinar el Estado de la Técnica es la

Fecha de presentación de la solicitud prioritaria 2005-05-31

- Se realizó la búsqueda en el estado de la técnica de documentos relacionados con la solicitud teniendo en cuenta la fecha indicada; y durante la búsqueda de anterioridades se encontraron los siguientes documentos, que forman parte de la familia de patentes de la presente solicitud: Publicación US 2006/0269442 A1 del 2006-11-30; publicación EP 1 728 466 A3 del 2006-12-27 y patente

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Journal of Management Studies, 19(1), 67-80.

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THE UNIVERSITY OF CHICAGO

EP 1 728 466 B1 del 2009-01-14. Se anexa la copia de las primeras páginas de estos documentos junto con la copia de un capítulo reivindicatorio presentado como modificación el 2008-05-28 ante la USPTO (para que tenga sentido la siguiente copia); la copia de una negación previa, fechada 2008-09-26 de la USPTO; la copia del Informe de Búsqueda Europeo; y, la copia del capítulo reivindicatorio admitido por la Oficina Europea, en su versión en inglés. También se encontraron los siguientes documentos que forman parte del estado de la técnica más cercano al objeto de la solicitud:

n.º	Documento	Título	Fecha de publicación
D1	Patente EP 0 071 058 B1, cuyo inventor es tatuya Yamaguchi, quien le cedió sus derechos a la Olympus Optical Co., Ltd.	«Washing device of endoscope fluid pipes»(Un dispositivo lavador para las tuberías de un endoscopio)	1987-11-11
D2	Patente US 5 840 251, cuyo inventor es Yasuo Iwaki, quien le cedió sus derechos a la Nitto Medical Corporation	«Device and method for cleaning, disinfecting and drying an endoscope»(Un dispositivo y un método para limpiar, desinfectar y secar un endoscopio)	1998-11-24
D3	Patente US 6 354 312 B1, cuyos inventores son Szu-Min Lin, Paul T. Jacobs, Paul Leonard, Rodrigo Berho, Douglas W. Fett y Ketih Schubert, quienes le cedieron sus derechos a la Ethicon, Inc.	«Connector without occlusion»(Un conector sin oclusión)	2002-03-12

Se anexa la copia de las páginas pertinentes de estos documentos

NOTAS: No se realizaron las evaluaciones de los demás requisitos de patentabilidad, porque se hicieron algunas objeciones respecto a la definición y la claridad de las reivindicaciones; esto es, no se pudo practicar un análisis comparativo, por ausencia de materia.

A pesar de lo anterior, con base en las enseñanzas de los documentos encontrados hasta ahora, y con fundamento en la negación previa de la USPTO y el Informe de Búsqueda Europeo, mencionados arriba, se prevén objeciones respecto al nivel inventivo del objeto de la solicitud.

Teniendo en cuenta lo anterior, se le sugiere al solicitante que, si considera que el objeto de la solicitud reúne los requisitos para ello -en especial los determinados por el artículo 81 de la Decisión 486-, cambie la modalidad de su solicitud a patente de modelo de utilidad. De aceptar esta sugerencia, deberá expresarlo así y deberá realizar los ajustes que considere necesarios en el capítulo reivindicatorio para que no se encuentre ninguna objeción previsible -en el momento en que la Oficina examine su solicitud para verificar el cumplimiento de los requisitos, bajo esta nueva modalidad-.

Esta sugerencia se hace en concordancia con lo dispuesto en el artículo 35 de la mencionada Decisión.

5. Análisis preliminar de los documentos D1 a D3:

Los números de referencia que se citan adelante son los propios de cada documento bajo análisis.

En D1 se enseña, entre otras cosas, un conector (71) que comunica una cavidad de un dispositivo (1) con un fluido suministrado por un reprocesador de endoscopios (74), en donde el dispositivo incluye un puerto (60) que tiene una abertura configurada para permitir el flujo dentro de la cavidad y donde el puerto incluye una superficie exterior. El conector (71) comprende: una canalización de flujo configurada para estar en comunicación fluida con el puerto; un miembro resiliente (elástico) que incluye una superficie de sello móvil que está configurada, a su vez, para estar engarzada con la superficie exterior del puerto cuando el reprocesador de endoscopios suministre un flujo de fluido hacia el conector bajo una primera presión de flujo tal que el flujo de fluido se pueda dirigir dentro de la abertura y donde la superficie de sello está configurada para desengarzarse de la superficie exterior del puerto cuando el reprocesador de endoscopios suministre el flujo de fluido a una segunda presión de flujo, de tal manera que el flujo de fluido pueda ser dirigido sobre la superficie exterior (ver figura 5 de D1).

Se subraya que D1 revela que el conector (71) está fabricado con un material plegable, de donde se deduce que el conector es capaz de engarzarse en la superficie exterior del puerto a una primera presión de flujo de fluido y de desengarzarse a una segunda presión de flujo de fluido, mayor que la primera. Esta deducción no implica ninguna actividad inventiva, porque se trata de un conocimiento adquirido por la experiencia y que es de dominio de cualquier persona del nivel medio en la técnica.

D1 también enseña que el conector (71) tiene una porción curvada inferior, que forma parte de la superficie de sello del conector (71). Esta porción también forma un reborde anular que termina en un extremo distal libre.

En D2 se enseña, entre otras cosas, un dispositivo para limpiar, desinfectar y secar un endoscopio, en el cual el cuerpo tubular, la tubería de entrada, la tubería que se desprende lateralmente de la tubería de entrada y el recipiente de fluido ubicado dentro de dicho cuerpo tubular están hechos con una cualquiera de las siguientes sustancias: polietileno, resina de polivinilo, polipropileno, policarbonato, poliéster, poliestireno, silicona, cloruro de polivinilideno y acetato de polivinilo (reivindicación 8 de D2).

En D3 se enseña, entre otras cosas, un conector (119) configurado para conectar por medio de fluidos una cavidad de un endoscopio (120) con un flujo de fluido suministrado por un reprocesador de endoscopios, en donde el dispositivo incluye un puerto (134) que tiene una abertura que está configurada para permitir el flujo dentro de la cavidad y donde el puerto incluye una superficie exterior (144) y una superficie interior. El conector (119) comprende un pasaje de flujo configurado para estar en comunicación fluida con el puerto, medios de sello (149) para sellar por medio de engarce con el puerto sobre la superficie de sello (140); y, unos medios (222) para: dirigir el flujo sobre por lo menos una porción de la superficie interior del puerto, para limpiar la superficie interior; y, para dirigir el flujo de fluido sobre por lo menos una porción de la superficie exterior (144) del puerto, para limpiar dicha superficie exterior.

6. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados negativamente por la falta de claridad de la descripción y las reivindicaciones y por la falta de definición, de sustento y de concisión de estas últimas.

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US 20060269442A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2006/0269442 A1**
(43) **Pub. Date: Nov. 30, 2006**

(54) **ENDOSCOPE REPROCESSOR
CONNECTORS HAVING REDUCED
OCCLUSION**

(52) **U.S. CL** 422/28; 422/300

(76) **Inventors:** Nick Ngoc Nguyen, Silverado, CA
(US); Todd Morrison, Dana Point, CA
(US)

(57) **ABSTRACT**

Correspondence Address:
PHILIP S. JOHNSON
JOHNSON & JOHNSON
ONE JOHNSON & JOHNSON PLAZA
NEW BRUNSWICK, NJ 08933-7003 (US)

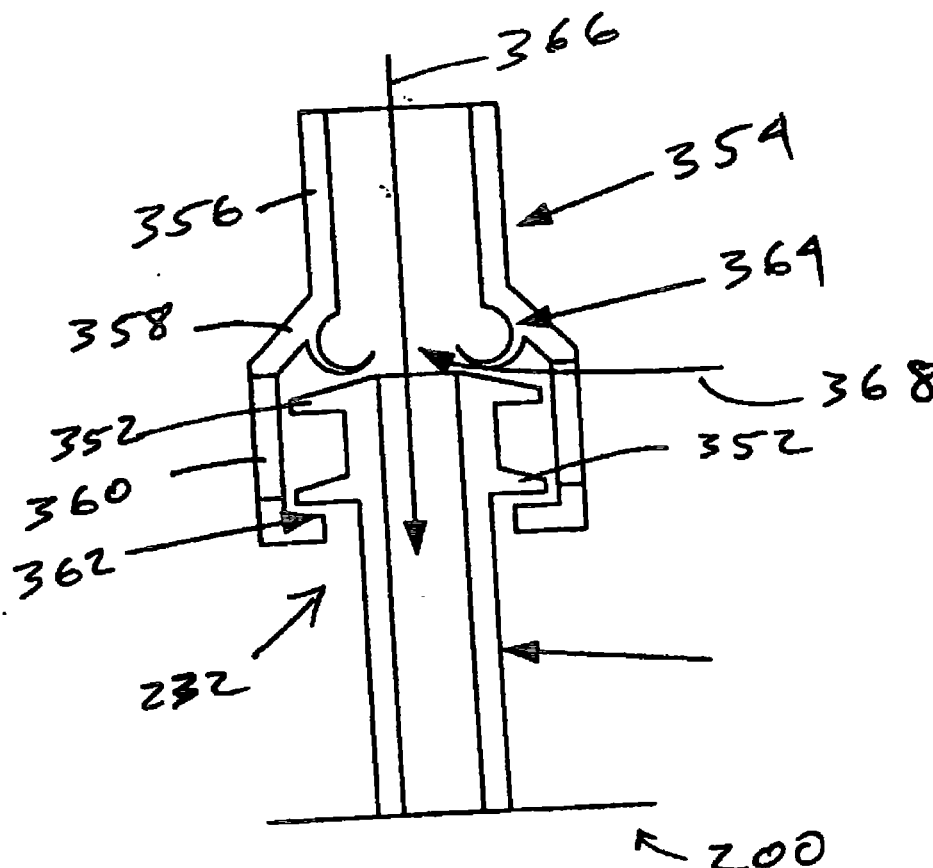
An occlusion minimizing connector connects a lumen in a lumen device to a source of sterilization fluid in an endoscope reprocessor. The connector has a sealing portion shaped to engage a surface on the lumen device. The sealing portion is formed of a resilient material biasing a sealing surface into contact with the surface on the lumen device. The biasing is such that the seal is maintained when pressure within the flow passage is below a predetermined level preventing leakage of the flow past the sealing portion. When pressure within the flow passage is above the predetermined level fluid leaks past the sealing portion to bathe the surface on the lumen device. Thus, the surface will not be occluded during a cleaning process.

(21) **Appl. No.:** 11/141,431

(22) **Filed:** May 31, 2005

Publication Classification

(51) **Int. Cl.**
A61L 2/16 (2006.01)



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Journal of Management Studies, 19(6), 701-718.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the situation.

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Journal of Management Studies, 19(1), 67-80.

100-443887-100

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

10-10-1964

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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Journal of Management Education 30(6)p.789-804

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THE FIRST PART OF THE DOCUMENT IS A LIST OF THE NAMES OF THE MEMBERS OF THE COMMITTEE.

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THE EIGHTH PART OF THE DOCUMENT IS A LIST OF THE NAMES OF THE MEMBERS OF THE COMMITTEE.

THE NINTH PART OF THE DOCUMENT IS A LIST OF THE NAMES OF THE MEMBERS OF THE COMMITTEE.

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opening, wherein the opening is configured to permit the fluid flow into the lumen, and wherein the port includes an outer surface, the connector **71** comprising: a flow path configured to be placed in fluid communication with the port; and a resilient member including a movable sealing surface, wherein the sealing surface is configured to be engaged with the outer surface of the port when the endoscope reprocessor supplies the fluid flow to the connector at a first flow pressure such that the fluid flow can be directed into the opening, and wherein the sealing surface is configured to be disengaged from the outer surface of the port when the endoscope reprocessor supplies the fluid flow to the connector at a second flow pressure such that at least a portion of the fluid flow can be directed over the outer surface. See Figure 5.

It is noted that Yamaguchi discloses that the connector **71** is fabricated from a pliant material. Thus, the Examiner holds that the pliant connector would have been capable of engaging the outer surface of the port at a first pressure of fluid flow and disengaging from the outer surface of the port at a second, higher pressure of fluid flow.

As to claims 20, 21, 25, and 26, Yamaguchi discloses an arcuate portion (curved lower portion) as part of the sealing surface of the connector **71**. This same portion also forms an annular flange terminating in a free distal end.

5. Claims 30 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin et al. (US 6,354,312).

Lin et al. teaches a connector **119** configured to fluidly connect a lumen of a lumen device **120** to a fluid flow supplied by an endoscope reprocessor, wherein the lumen device includes a port **134** having an opening, wherein the opening is configured

Application/Control Number: 11/141,431

Page 4

Art Unit: 1797

to permit the fluid flow into the lumen, and wherein the port includes an outer surface and an inner surface, the connector **119** comprising: a flow passage configured to be placed in fluid communication with the port; sealing means **149** for sealing engaging the port; and flow directing means **222** for directing the fluid flow over at least a portion of the inner surface of the port to clean the inner surface and for directing the fluid flow over at least a portion of the outer surface of the port to clean the outer surface. See Figure 6; col.8, line 45 to col.9, line 14.

Drawings

6. The drawings are objected to because the Figures contain arrows without corresponding reference numerals. Specifically, in Figure 4, an arrow pointing to the arcuate portion of the connector lacks a reference numeral. In Figure 7, an arrow on the lower right side of the drawing lacks a reference numeral. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each

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Europäisches Patentamt
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Office européen des brevets



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EP 1 728 466 A3

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EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
27.12.2006 Bulletin 2006/52

(51) Int Cl.:
A61B 1/12 (2006.01) F16L 33/16 (2006.01)
A61B 1/00 (2006.01)

(43) Date of publication A2:
06.12.2006 Bulletin 2006/49

(21) Application number: 06252780.9

(22) Date of filing: 30.05.2006

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR
Designated Extension States:
AL BA HR MK YU

(72) Inventors:
• Nhuyen, Nick Ngoc
Silverado, CA 92676 (US)
• Morrison, Todd
Dana Point, CA 92629 (US)

(30) Priority: 31.05.2005 US 141431

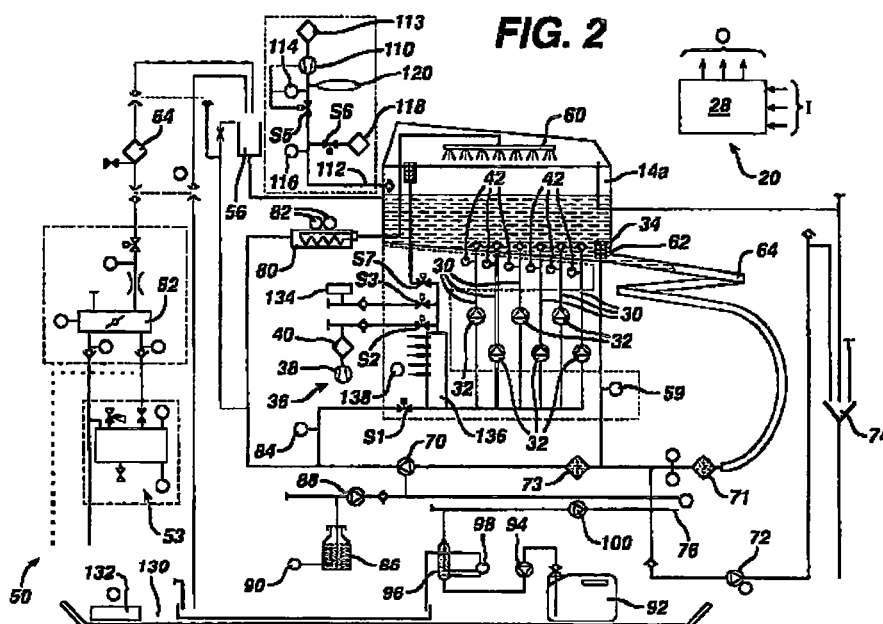
(74) Representative: Fisher, Adrian John et al
CARPMAELS & RANSFORD
43-45 Bloomsbury Square
London WC1A 2RA (GB)

(71) Applicant: ETHICON, INC.
Somerville,
New Jersey 08876 (US)

(54) Endoscope reprocessor connectors having reduced occlusion

(57) An occlusion minimizing connector connects a lumen in a lumen device to a source of sterilization fluid in an endoscope reprocessor. The connector has a sealing portion shaped to engage a surface on the lumen device. The sealing portion is formed of a resilient material biasing a sealing surface into contact with the surface on the lumen device. The biasing is such that the seal is

maintained when pressure within the flow passage is below a predetermined level preventing leakage of the flow past the sealing portion. When pressure within the flow passage is above the predetermined level fluid leaks past the sealing portion to bathe the surface on the lumen device. Thus, the surface will not be occluded during a cleaning process.



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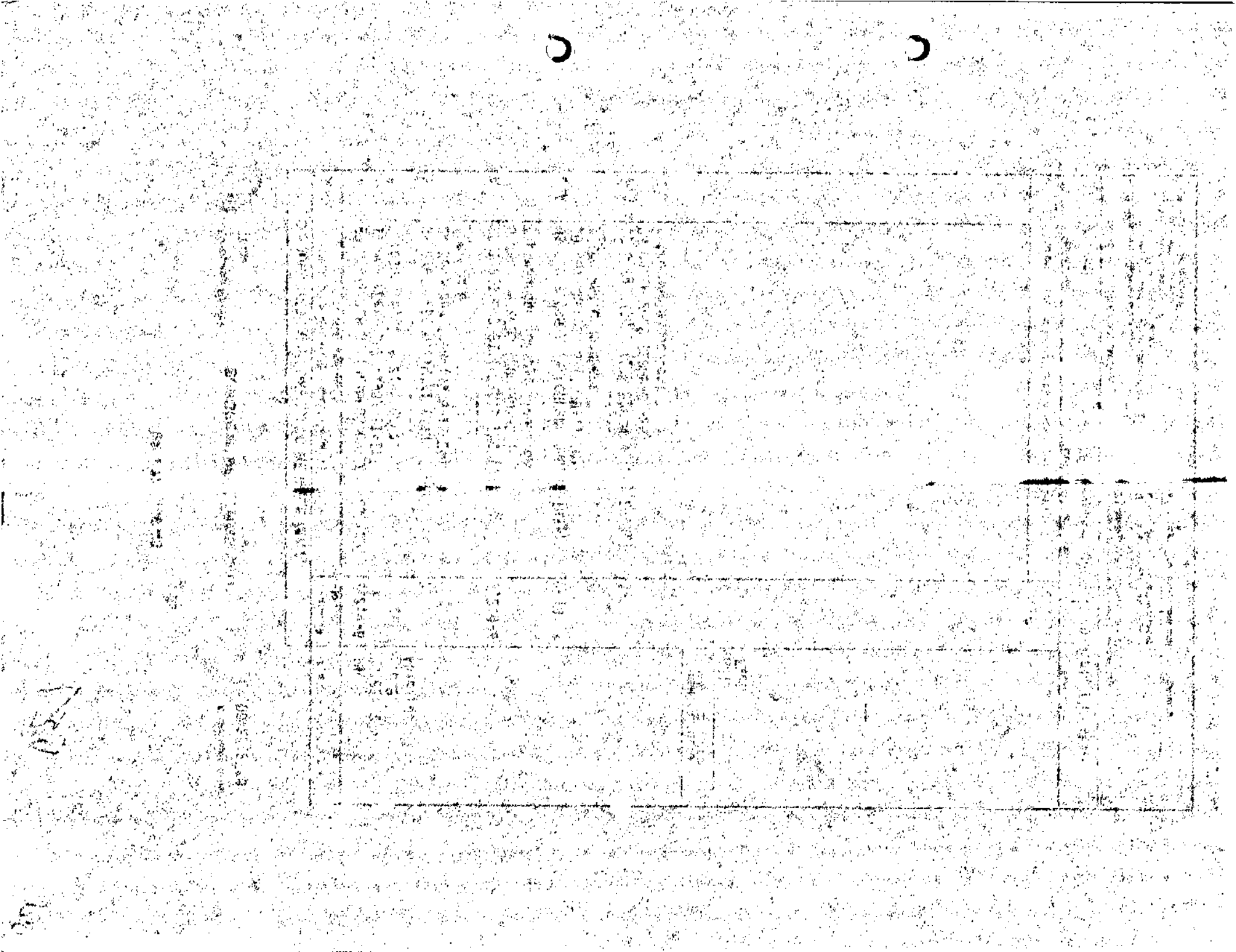
European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 25 2780

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 071 058 B1 (OLYMPUS OPTICAL CO [JP]) 11 November 1987 (1987-11-11)	1,2,4-6	INV. A61B1/12 F16L33/16 A61B1/00
Y	* column 5, line 2; figures 1,5 *	7	
Y	US 5 840 251 A (IWAKI YASUO [JP]) 24 November 1998 (1998-11-24) * claim 8 *	7	
A	EP 1 253 849 B1 (STERIS INC [US]) 5 January 2005 (2005-01-05) * paragraph [0030]; figure 6A *	1,2,4-6	
D,A	US 5 833 935 A (MALCHESKY PAUL S [US]) 10 November 1998 (1998-11-10) * the whole document *	1-18	
D,A	US 6 041 794 A (LIN SZU-MIN [US] ET AL) 28 March 2000 (2000-03-28) * the whole document *	1-18	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61B F16L
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 November 2006	Examiner Daniel, Christian
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons a : member of the same patent family, corresponding document			

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EP 1 728 466 A3

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 06 25 2780

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.
16-11-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 6041794 A	28-03-2000	DE 19934176 A1 JP 2000051329 A US 6354312 B1	10-02-2000 22-02-2000 12-03-2002

EPO FORM P463

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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(11) **EP 1 728 466 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
14.01.2009 Bulletin 2009/03

(51) Int Cl.:
A61B 1/12 (2006.01) F16L 33/16 (2006.01)
A61B 1/00 (2006.01)

(21) Application number: **08252780.9**

(22) Date of filing: **30.05.2006**

(54) **Endoscope reprocessor connectors having reduced occlusion**

Anschlüsse für ein Endoskopreinigungsgerät mit verminderter Verschlusstendenz

Dispositif de retraitement pour endoscopes comportant une tendance de bouchage reduite

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **31.05.2005 US 141431**

(43) Date of publication of application:
06.12.2006 Bulletin 2006/49

(73) Proprietor: **ETHICON, INC.**
Somerville,
New Jersey 08876 (US)

(72) Inventors:
• **Nhuyen, Nick Ngoc**
Silverado, CA 92676 (US)
• **Morrison, Todd**
Dana Point, CA 92629 (US)

(74) Representative: **Fisher, Adrian John et al**
CARPMAELS & RANSFORD
43-45 Bloomsbury Square
London WC1A 2RA (GB)

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EP 1 728 466 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

1. The first step in the process is to identify the problem. This involves gathering information about the situation and understanding the needs of the stakeholders involved.

Step 28. Continue Block Test

[0080] As disinfectant In-use solution is pumped through the channels, the flow rate through the channels is also measured as in Step 15.

Step 29. Drain

[0081] The drain pump 72 is activated to remove the disinfectant solution from the basin and the channels.

Step 30. Blow air

[0082] During the drain process sterile air is blown through all endoscope channels simultaneously to minimize potential carryover.

FINAL RINSE

Step 31. Fill basin

[0083] The basin is filled with sterile warm water (45 °C) that has been passed through a 0.2 µ filter.

Step 32. Rinse

[0084] The rinse water is circulated within the endoscope channels (via the channel pumps 32) and over the exterior of the endoscope (via the circulation pump 70 and the sprinkler arm 60) for 1 minute.

Step 33. Continue Block test

[0085] As rinse water is pumped through the channels, the flow rate through the channels is measured as in Step 15.

Step 34. Drain

[0086] The drain pump 72 is activated to remove the rinse water from the basin and the channels.

Step 35. Blow air

[0087] During the drain process sterile air is blown through all endoscope channels simultaneously to minimize potential carryover.

Step 36. Repeat rinse

[0088] Steps 31 through 35 are repeated two more times (a total of 3 post-disinfection rinses) to ensure maximum reduction of disinfectant residuals from the endoscope 200 and surfaces of the reprocessor.

FINAL LEAK TEST

Step 37. Pressurize the endoscope body and measure leak rate

[0089] Repeat Step 6.

Step 38. Indicate program completion

[0090] The successful completion of the program is indicated on the touch screen.

Step 39. De-pressurize the endoscope

[0091] From the time of program completion to the time at which the lid is opened, pressure within the endoscope body is normalized to atmospheric pressure by opening the vent valve S5 for 10 seconds every minute.

Step 40. Identify the user

[0092] Depending on customer-selected configuration, the system will prevent the lid from being opened until a valid user identification code is entered.

Step 41. Store program Information

[0093] Information about the completed program, including the user ID, endoscope ID, specialist ID, and patient ID are stored along with the sensor data obtained throughout the program.

Step 42. Print program record

[0094] If a printer is connected to the system, and if requested by the user, a record of the disinfection program will be printed.

Step 43. Remove the endoscope

[0095] Once a valid user identification code has been entered, the lid may be opened (using the foot pedal as in step 1, above). The endoscope is then disconnected from the flush lines 30 and removed from the basin 14a. The lid can then be closed using both the hardware and software buttons as described in step 4, above.

[0096] The invention has been described with reference to the preferred embodiments. Obviously, modifications and alterations will occur to others upon reading and understanding the preceding detailed description. It is intended that the invention be construed as including all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

55 **Claims**

1. A connector (300; 322; 342; 354; 400; 420) for connecting a lumen in a lumen device (200) to a source

of fluid in an endoscope reprocessor, the connector comprising;

a coupling configured to engage with a port (228; 228a; 230; 232) connected to the lumen on the lumen device (200) wherein the port includes a first sealing surface (318);
a flow passage;
a sealing portion (304; 334; 346; 364; 404; 428) connected with the flow passage and comprising a second sealing surface shaped to engage the first sealing surface;
the sealing portion being formed of a resilient material; and
the sealing portion being adapted to engage with the first sealing surface under a condition of a first flow (314; 336; 348; 366; 410) in the connector;

characterised by the sealing portion (304; 334; 346; 364; 404; 428) being movably connected with the flow passage and being further adapted to disengage from the first sealing surface (318) under a condition of a second flow (316; 338; 350; 368; 412), different from the first flow (314; 336; 348; 366; 410), in the connector (300; 322; 342; 354; 400; 420).

2. A connector according to claim 1 wherein the resilient material of the sealing portion (304; 334; 346; 364; 404; 428) biases the second sealing surface into contact with the first sealing surface (318) when engaged therewith, the biasing being such that the second sealing surface seals against the first sealing surface when pressure within the flow passage associated with the first flow (314; 336; 348; 366; 410) is below a predetermined level preventing leakage of the flow there past and that the second surface does not seal against the first surface (318) when pressure within the flow passage associated with the second flow (316; 338; 350; 368; 412) is above the predetermined level thereby allowing flow over the first sealing surface (318).
3. A connector according to claim 1 wherein the resilient material of the sealing portion (304; 334; 346; 364; 404; 428) biases the second sealing surface away from contact with the first sealing surface (318) when engaged therewith, the biasing being such that the second sealing surface does not seal against the first sealing surface when pressure within the flow passage associated with the first flow (314; 336; 348; 366; 410) is below a predetermined level allowing leakage of the flow there past and wherein the sealing portion (304; 334; 346; 364; 404; 428) is oriented such that when pressure within the flow passage associated with the second flow (316; 338; 350; 368; 412) is above the predetermined level, such pressure urges the second sealing surface into contact

with the first sealing surface (318) thereby preventing leakage of the flow there past.

4. A connector according to claim 1 wherein the sealing portion (304; 334; 346; 364; 404; 428) is formed integral with the connector (300; 322; 342; 354; 400; 420).
5. A connector according to claim 1 wherein the first sealing surface (318) is cylindrical and wherein the sealing portion (304; 334; 346; 364; 404; 428) comprises an annular flange sized to seat against the first sealing surface (318).
6. A connector according to claim 1 wherein the sealing portion (304; 334; 346; 364; 404; 428) comprises a free distal edge.
7. A connector according to claim 1 wherein the sealing portion (304; 334; 346; 364; 404; 428) is formed of silicone.
8. A connector according to claim 1 wherein the first flow (314; 336; 348; 366; 410) is associated with a pressure at the sealing portion less than 0.83 bar (12 psig) and the second flow (316; 338; 350; 368; 412) is associated with a pressure at the sealing portion greater than 0.83 bar (12 psig).
9. A connector according to claim 1 wherein the first flow (314; 336; 348; 366; 410) is associated with a pressure at the sealing portion (304; 334; 346; 364; 404; 428) greater than 0.35 bar (5 psig) and the second flow (316; 338; 350; 368; 412) is associated with a pressure at the sealing portion less than 0.35 bar (5 psig).
10. A method of connecting a port (228; 228a; 230; 232) on a lumen device (200) to an endoscope reprocessor and flowing fluid through the port; the method comprising the steps of:

attaching a coupling on the endoscope reprocessor to the port (228; 228a; 230; 232), the coupling having a flow passage therethrough and a sealing portion (304; 334; 346; 364; 404; 428) attached to the flow passage, and being formed of a resilient material;
flowing a first flow (314; 336; 348; 366; 410) through the flow passage and into the port (228; 228a; 230; 232);

characterised by:

the sealing portion (304; 334; 346; 364; 404; 428) being movably attached to the flow passage and being moveable from a first position to a second position;

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- the resilient material biasing the sealing portion (304; 334; 346; 364; 404; 428) into one of the first position or second position;
the step of flowing a first flow (314; 336; 348; 366; 410) causing the sealing portion (304; 334; 346; 364; 404; 428) to move into the first position;
the method further including the step of flowing a second, different, flow (316; 338; 350; 368; 412) through the flow passage causing the sealing portion (304; 334; 346; 364; 404; 428) to move into the second position; and
wherein one of the first position and the second position comprises a sealing position in which the sealing portion (304; 334; 346; 364; 404; 428) seals against a first sealing surface (318) on the port (228; 228a; 230; 232) to prevent flow there past, and wherein the other of the first position and the second position comprises a non-sealing position in which the sealing portion (304; 334; 346; 364; 404; 428) is away from the first sealing surface (318) to allow flow over the first sealing surface (318).
11. A method according to claim 10 wherein the first position is the sealing position.
12. A method according to claim 11 wherein the sealing portion (304; 334; 346; 364; 404; 428) is biased toward the first position.
13. A method according to claim 10 wherein the sealing portion (304; 334; 346; 364; 404; 428) is biased toward the first position.
14. A method according to claim 10 wherein the second flow (316; 338; 350; 368; 412) has a higher pressure than the first flow (314; 336; 348; 366; 410).
15. A method according to claim 14 wherein the higher pressure is created by increasing volume of the second flow (316; 338; 350; 368; 412).
16. A method according to claim 14 wherein the second flow (316; 338; 350; 368; 412) has a pressure above 0.83 bar (12 psig).
17. A method according to claim 10 wherein the second flow (316; 338; 350; 368; 412) is in a different direction than the first flow (314; 336; 348; 366; 410).
18. A method according to claim 10 wherein the first flow (314; 336; 348; 366; 410) comprises a fluid selected from a list consisting of: a washing fluid, an antimicrobial agent, and combinations thereof.

Patentansprüche

1. Verbinder (300; 322; 342; 354; 400; 420) zum Verbinden eines Lumens in einer Lumenvorrichtung (200) mit einer Fluidquelle in einem Endoskop-Reprozessor, wobei der Verbinder aufweist:
- eine Kopplung, die so ausgestaltet ist, dass sie an einen Port (228; 228a; 230; 232) anschliesst, der mit dem Lumen auf der Lumenvorrichtung (200) verbunden ist, wobei der Port eine erste Dichtfläche (318) umfasst;
einen Strömungsdurchlass;
einen Dichtbereich (304; 334; 346; 364; 404; 428), der mit dem Strömungsdurchlass verbunden ist und eine zweite Dichtfläche aufweist, die so geformt ist, dass sie an der ersten Dichtfläche anliegt;
wobei der Dichtbereich aus einem nachgiebigen Material gebildet ist; und
wobei der Dichtbereich so ausgelegt ist, dass er unter der Bedingung einer ersten Strömung (314; 416; 348; 366; 410) in dem Verbinder an der ersten Dichtfläche anliegt;
- dadurch gekennzeichnet, dass der Dichtbereich (304; 334; 346; 364; 404; 428) beweglich mit dem Strömungsdurchlass verbunden ist und weiter so ausgelegt ist, dass er sich von der ersten Dichtfläche (318) unter der Bedingung einer zweiten Strömung (316; 338; 350; 368; 412) löst, die von der ersten Strömung (314; 416; 348; 366; 410) in dem ersten Verbinder (300; 322; 342; 354; 400; 420) unterschiedlich ist.
2. Verbinder nach Anspruch 1, bei dem das nachgiebige Material des Dichtbereiches (304; 334; 346; 364; 404; 428) die zweite Dichtfläche in den Kontakt mit der ersten Dichtfläche (318) vorbelastet, wenn sie daran anliegt, wobei die Vorbelastung derart ist, dass die zweite Dichtfläche gegen die erste Dichtfläche abdichtet, wenn der Druck innerhalb des Strömungsdurchlasses, der mit der ersten Strömung (314; 416; 348; 366; 410) verknüpft ist, unterhalb eines vorbestimmten Wertes liegt, um ein Entweichen der Strömung an diesen vorbei zu verhindern, und dass die zweite Fläche nicht gegen die erste Fläche (318) abdichtet, wenn der Druck innerhalb des Strömungsdurchlasses, der mit der zweiten Strömung (316; 338; 350; 368; 412) verknüpft ist, oberhalb des vorbestimmten Wertes liegt, so dass eine Strömung über die erste Dichtfläche (318) erlaubt wird.
3. Verbinder nach Anspruch 1, bei dem das nachgiebige Material des Dichtbereiches (304; 334; 346; 364; 404; 428) die zweite Dichtfläche weg aus dem Kontakt mit der ersten Dichtfläche (318) vorbelastet,

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Description

This invention relates to a washing device of endoscope fluid pipes. An endoscope generally comprises various pipes through which air, water and other liquids are conducted. After, therefore, the application of an endoscope, it is necessary to thoroughly wash not only the peripheral surface of the endoscope but also the interior of the liquid pipes. The conventional process of washing the interior of the liquid pipes has the drawbacks that a washing liquid-pouring pipe has to be attached to the mouthpieces of the respective fluid pipes; the operation of the valves of the fluid pipes by their control valves is accompanied with troublesome work; and the detailed parts of the control valves and those parts of a cylinder which are covered with a piston tends to be washed very imperfectly.

It is accordingly the object of this invention to provide a washing device of endoscope fluid pipes which allows for the easy fitting of a washing liquid-feeding device to the respective endoscope fluid pipes and effects the reliable washing of the interior of the fluid pipes and their valve devices.

To attain the above-mentioned object, this invention provides a washing device of a pipe of an endoscope comprising at least one valve for controlling the operation of said pipe said valve being formed of a cylinder which is detachably fitted with a valve member leaving an opening exposed to the outside when said valve member is removed, the said washing device characterized by comprising at least one connector which, when the valve member is removed, communicates with the opening of the cylinder in liquid tightness and which is provided with an inlet port communicating with the interior of said cylinder and a washing liquid-feeding tube which is connected to the connector and communicates with the inlet port whereby a washing liquid is conducted into the cylinder and the pipe communicating therewith through said tube and inlet port.

This invention can be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

Fig. 1 shows the arrangement of an endoscope adapted to be fitted with a fluid pipe-washing device according to a first embodiment of this invention;

Fig. 2 indicates the arrangement of a water-storage tank;

Fig. 3 is a lateral sectional view of a valve device of an endoscope fluid pipe;

Fig. 4 illustrates the manner in which the fluid pipe-washing device according to the first embodiment of the invention is applied to the endoscope shown in Fig. 1;

Fig. 5 is a lateral sectional view of the connector of the fluid pipe-washing device according to the first embodiment of the invention when connected to the endoscope shown in Fig. 1;

Fig. 6 sets forth the arrangement of an endoscope adapted to be fitted with a fluid pipe-washing device according to a second embodiment of the invention; and

Fig. 7 is a sectional view of an endoscope fluid pipe-washing device according to a third embodiment of the invention.

Description is now given with reference to Figs. 1 to 5 of an endoscope fluid pipe-washing device according to a first embodiment of the invention.

Reference numeral 1 denotes an endoscope, which comprises an insertion section 2, control section 3, light guide cable 4 and connector 9. Fluid pipes to be described later extend through the endoscope 1. An air pipe 5 and water pipe 6 extend through the insertion section 2, control section 3 and light guide cable 4. The converged downstream ends of the air pipe 5 and water pipe 6 are connected to an air-water ejecting nozzle 7 fitted to the distal end of the insertion section 2. The tip of the air-water ejecting nozzle 7 is directed toward the outer surface of an observation window 8. The nozzle 7 ejects water or air to the outer surface of the observation window 8 for cleaning. A connector 9 is fitted to the extended end of the light guide cable 4. The connector 9 comprises first and second air-ejecting mouthpieces 10, 11 communicating with the air pipe 5, a water-ejecting mouthpiece 12 communicating with the water pipe 6 and a suction mouthpiece 13 communicating with a suction pipe to be described later. When the connector 9 is fitted to a light source device (not shown), the first air-injecting mouthpiece 10 is connected to an air pump held in a light source device. The second air-ejecting mouthpiece 11 and water-ejecting mouthpiece 12 are respectively connected to an air-ejecting pipe 15 and water-ejecting pipe 16 attached to the water storage tank 14 (Fig. 2). Reference numeral 14a denotes an additional connector detachably fitted to the connector 9. Said additional connector 14a is used when the air-ejecting pipe 15 and water-ejecting pipe 16 fitted to the water storage tank 14 are respectively connected to the aforesaid second air-ejecting mouthpiece 11 and water-ejecting mouthpiece 12. The suction mouthpiece 13 is connected to a suction device (not shown). A suction pipe 17 extends through the insertion section 2, control section 3 and light guide cable 4. A treating implement-guiding channel 18 is concurrently used as the distal end portion of the suction pipe 17. The distal end of the treating implement-guiding channel 18 is open at the distal end 2a of the insertion section 1. The proximal end of said treating implement-guiding channel 18 constitutes a port 19 open to the outside to allow for the insertion of treating implements. A forceps plug 20 is detachably fitted to the port 19. The forceps plug 20 is formed of, for example, an elastic ring to allow for the insertion of a treating implement such as forceps into the treating implement-guiding channel 18.

The channel 18 is connected to the proximal end of the suction pipe 17 by means of a suction

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valve 21. An air-water valve 22 is set in the intermediate part of the air pipe 5 and water pipe 6. The suction valve 21 and air-water valve 22 are arranged in parallel in the proximity of the lateral wall of the control section 3 as shown in Fig. 3. The air-water valve 22 consists of a blind cylinder 23 acting as a valve seat and a hollow piston 24 acting as a valve member. The open end portion 25 of the cylinder 23 has larger inner and outer diameters than any other part of the cylinder 23. The open end portion 25 is tightly inserted into a penetrating hole 27 bored in the wall 26 of the control section 3. When a set ring 28 is threadedly fitted around the peripheral wall of the outer end portion of the cylinder 23, the wall 26 is securely clamped between the set ring 28 and the flange 29. A threaded cylindrical fitting ring 31 is detachably engaged with the outer periphery of a larger diameter section 30 formed on the inside of the open end portion 25. The engaged end portion of the fitting ring 31 is provided with a flange 32 projecting into the ring 31. The piston 24 acting as a valve consists of a larger diameter inner end portion 33 and a smaller diameter outer end portion 34. The inner end portion 33 slides through the cylinder 23. A release hole 35 extends axially through the piston 24. The other end portion 34 of the piston 24 projects from the cylinder 23. A compression coil spring 36 is wound about the outer end portion 34 of the piston 34. This compression coil spring 36 is interposed between the flange 32 and a finger plate formed at the outer end of the piston 24 to urge the piston 24 outward. The piston 24 is normally kept in a projecting waiting position with the end face of the inner section 33 pressed against the flange 32. When the fitting ring 31 is taken off, the piston 24 can be easily pulled out of the cylinder 23. An air-water pipe-closing peripheral wall 38 is formed in the inner end region of the inner section 33 of the piston 24. An annular communication groove 39 is formed in the peripheral wall of the outer end region of the inner section 33 of the piston 24.

In the cylinder 23, the influx end of the water pipe 6 is open to the communication groove 39 of the piston 24 when kept in a waiting position. The efflux end of said water pipe 6 is open to the pipe-closing peripheral wall 38. When the piston 24 is pushed in, the annular communication groove 39 is set between the influx and efflux end of the water pipe 6. The influx end of the air pipe 5 is open to the bottom of the cylinder 23. The efflux end of the air pipe 5 is positioned in the intermediate part of the cylinder 23. When the piston 24 is pushed in, the efflux end of the air pipe 5 is closed by the aforesaid pipe-closing peripheral wall 38 of the piston 24. While the piston 24 remains in a waiting position, the water pipe 6 is shut off by the pipe-closing peripheral wall 38. At this time, the air pipe 5 is left open and communicates with the outside through the release hole 35. Therefore, all air streams are drawn off to the outside, making it impossible to introduce air streams. Namely, while the piston 24 remains in a

waiting position, neither air streams nor water is supplied. When air streams are supplied, it is advised to put the underside of the finger tip on the finger plate 38 thereby to close the release hole 35 and stop the release of air streams. When water is introduced, it is advised to push in the piston while the release hole 35 is closed with the finger tip thereby to shut off the air pipe 5 and open the water pipe 6 by means of the annular communication groove 39.

Like the air-water valve 22, the suction valve 21 comprises a cylinder 41, piston 42, open end section 43 of the piston 42, set ring 44, larger diameter hole 45, fitting ring 46, flange 47, inner end region 48, outer end region 49, release hole 50, compression coil spring 51 and finger plate 52. Formed in the inner end region 48 of the piston 42 are an air hole 53 and axially extending guide groove 54. A pin 55 is inserted into the guide groove 54 to stop the rotation of the piston 42. The suction end of the suction pipe 17 is connected to the bottom of the cylinder 23. A hole 56 communicating with a treating implement-guiding channel 18 is provided at a point which faces the air hole 53 when the piston 42 is pushed in. While the piston 42 remains in a waiting position, the communication hole 56 is closed by the peripheral wall of the inner end region 48 of the piston 42. At this time, external air streams alone are sucked in through the release hole 50, but not through the treating implement guiding channel 18. When the piston 42 is pushed in with the release hole 50 closed with the finger, then the air hole 53 and communication hole 56 are aligned with each other, assuring the suction of air streams through the suction pipe 17.

Description is now given of a washing device A (Figs. 4 and 5) used to clean the various pipes 5, 6, 17 of the endoscope 1. The washing device A comprises a pair of connectors 60, 61, which are respectively fitted into the openings of the cylinders 23, 41 in liquid tightness, after removing the assembly of the coil spring 36 and piston 24 and the assembly of the coil spring 51 and piston 42. The connectors 60, 61 are substantially cylindrical and respectively provided with air-water inlet ports 60a, 61a. The connectors 60, 61 are fitted into openings 63, 64 formed in the front portion of a box-shaped socket body 62. Ring-shaped elastic packings 67, 68 respectively engageable with the larger diameter sections 30, 45 of the cylinders 23, 41 are fitted around the peripheries of the engagement sections 65, 66 of the connectors 60, 61 which project from the front part of the socket body 62. The peripheral edges of the openings 63, 64 are respectively loosely fitted into the annular engagement grooves 69, 70 formed in the peripheral walls of the connectors 60, 61, thereby enabling the relative positions of the connectors 60, 61 to be varied, and consequently fully absorbing a slight displacement occurring between the cylinders 23, 41 from the various factors involved in their manufacture and their different types. The connectors 60, 61 are connected to a connection pipe 73 provided in the

1. 凡在本行开立存款账户的客户，均可向本行申请开立定期存款账户。
 2. 定期存款账户的开立，须由客户填写《定期存款开户申请书》，并提供有效身份证件。
 3. 本行定期存款账户分为整存整付、零存整付、整存零付、零存零付四种类型。
 4. 定期存款的期限分为三个月、六个月、九个月、十二个月、十八个月、二十四个月、三十六个月、四十八个月、六十个月、七十二个月、八十四个月、九十六个月、一百零八个月、一百二十个月。
 5. 定期存款的利率按照中国人民银行规定的利率执行。
 6. 定期存款账户的开立，须由客户本人或授权代理人办理。
 7. 本行定期存款账户的开立，须符合中国人民银行的相关规定。

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1. The first step in the process of the investigation is the identification of the problem. This is done by the investigator who is responsible for the study. The next step is to collect data. This is done by the investigator who is responsible for the study. The next step is to analyze the data. This is done by the investigator who is responsible for the study. The next step is to interpret the results. This is done by the investigator who is responsible for the study. The next step is to draw conclusions. This is done by the investigator who is responsible for the study. The next step is to report the findings. This is done by the investigator who is responsible for the study. The next step is to discuss the implications. This is done by the investigator who is responsible for the study. The next step is to recommend further research. This is done by the investigator who is responsible for the study. The next step is to conclude the study. This is done by the investigator who is responsible for the study.

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete each task.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals and identifying any areas for improvement.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

[illegible]

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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socket body 62 by means of the corresponding
pilot tubes 71, 72. The connectors 60, 61 com-
municate through the connection pipe 73 with a
liquid-conducting tube 74 extending out of the
connection pipe 73. The lateral wall of the socket
body 62 is provided with members 75, 76 which
cause the socket body 62 to be engaged with the
endoscope 1 when the connectors 60, 61 are fitted
into the cylinders 23, 41. The engagement mem-
bers 75, 76 respectively comprise engagement
levers 77, 78 whose intermediate parts are swing-
ably fitted to the lateral wall of the socket body 62.
The engagement levers 77, 78 act at one end as
engagement pawls 81, 82 engageable with the
stepped engagement portions of the set rings 28,
44, and are used at the other end as control
sections 83, 84. Compression coil springs 85, 86
are respectively interposed between the lateral
wall of the socket body 62 and the control sec-
tions 83, 84 to urge the engagement levers 77, 78,
thereby causing the engagement pawls 81, 82 to
be engaged with the stepped engagement sec-
tions 79, 80 of the set rings 28, 44. The liquid-
conducting tube 74 is connected to a washing
liquid feeder 87 (Fig. 4). Where the washing
device A is applied, the pistons 24, 42, fitting rings
31, 46 and compression coil springs 36, 51 are
removed from the valves 21, 22 to open the
cylinders 23, 41 at one end (Fig. 5). The con-
nectors 60, 61 are respectively inserted into the
openings of the cylinders 23, 41, and the socket
body 62 is pushed in. At this time, the pawls 81, 82
of the engagement levers 77, 78 respectively slide
over the outer peripheral wall of the set rings 28,
44 and are engaged with the stepped engagement
sections 79, 80, thereby causing the socket body
62 to be securely set in place. A pressurized
washing liquid (rinsing water, detergent solution,
or sterilizing liquid) is supplied from a washing
liquid source 87 through the liquid-conducting
tube 74. The washing liquid is diverted in two
directions in the connection pipe 73. One diver-
sion of the washing liquid flows into the cylinder
23 of the air-water valve 22 through the inlet port
60a of the connector 60, and the pipes 5, 6
communicating with the cylinder 23, and is drawn
out through the air-water nozzle 7, air-ejecting
mouthpieces 10, 11 and water-ejecting mouth-
piece 12. As a result, it is possible to wash the
interior of the cylinder 23 and the pipes 5, 6
communicating with the cylinder 23. The other
diversion of the washing liquid which flows into
the other connector 61 through its inlet port 61a
runs into the suction pipe 17 and treating imple-
ment-guiding channel 18 which are made to
communicate with the washed cylinder 41 of the
suction valve 22, and is drawn off at the opposite
ends of the pipe 17 and channel 18. Consequently
it is possible to wash the interior of the cylinder
41, suction pipe 17 and treating implement-guid-
ing channel 18. The forceps plug 20, pistons 24, 42
and fitting rings 31, 46 taken off the endoscope 1
are individually cleaned, for example, by a brush.
With foregoing embodiment, the connectors 60,
61 are respectively engaged with the cylinders 23,

41, making it possible to clean the interior of the
cylinders 23, 41 and pipes 5, 6, 7 at the same time.

It is possible to provide the connectors 60, 61 of
the foregoing embodiment separately and attach
individual engagement means thereto, and fix the
connectors 60, 61 respectively to the cylinders 23,
41.

Description is now given with reference to Fig. 6
of the arrangement of an endoscope 90 adapted
to be fitted with a fluid pipe-washing device
according to a second embodiment of the inven-
tion. This endoscope 90 is constructed by insert-
ing a gas pipe 91 for supplying an unflammable
gas such as carbon dioxide into the control
section 3 of the endoscope 1 of the foregoing
embodiment and inserting a gas valve 92 into the
gas pipe 91 in parallel with the valves 21, 22. Like
the valves 21, 22, this gas valve 92 consists of a
cylinder 93 and piston 94. The piston 94 is
detachably fitted to the cylinder 93 by means of a
fitting ring 95.

The washing device of the endoscope 90 is
constructed by providing similar connectors to
the connectors 60, 61 of the preceding embodi-
ment in parallel relationship in such a state as is
insertible in water tightness into the opening of
the cylinder 93 stripped of the piston 94. In other
words, the second embodiment of Fig. 6 com-
prises three connectors which can be respectively
fitted into the cylinders 23, 41, 93 of the valves 21,
22, 92 at the same time.

Description is now given with reference to Fig. 7
of an endoscope fluid pipe-washing device
according to a third embodiment of this inven-
tion. With this embodiment, an individual con-
nector is not fitted into the openings of the cylinders
23, 41. Instead, a connector 102 is formed of a
box-shaped socket body 101 which comprises an
inlet port 100 communicating with the openings
of the cylinders 23, 41. The peripheral edge of the
opening of the socket body 101 is fitted with a
packing 103 which is pressed against the surface
of the control section 3 of the endoscope 1,
thereby enabling the socket body 101 to be
connected to the control section 3 in liquid tight-
ness. The engagement pawls 106 of the engage-
ment levers 105 acting as engagement means 104
constructed substantially in the same manner as
in the foregoing embodiments are made
engageable with engagement projections 107
provided on the periphery of the cylinders 23, 41.

With the aforementioned endoscope fluid pipe-
washing device of this invention, the valves of the
endoscope pipes are removed to open the corre-
sponding cylinders. The connectors are fitted into
said openings to supply a washing liquid from its
source, and a washing liquid is introduced into
the cylinders and the pipes communicating with
said cylinders for washing. In other words, only
the fitting of the connectors into the openings of
the corresponding cylinders allows for the easy
washing of the interior of the cylinders and the
endoscope pipes communicating with the cylin-
ders, making it unnecessary to control the pipe
valves and simplifying the washing operation.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete them.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals to determine the effectiveness of the intervention.

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4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly to ensure that the project is on track.

5. Finally, the fifth step is to evaluate the results of the project. This involves assessing whether the objectives have been met and identifying any lessons learned for future projects.

1. The first step in the process of the development of the new curriculum is the identification of the needs of the community. This is done through a series of interviews and focus group discussions with the community members. The second step is the identification of the resources available in the community. This is done through a series of interviews and focus group discussions with the community members. The third step is the identification of the gaps in the existing curriculum. This is done through a series of interviews and focus group discussions with the community members. The fourth step is the development of the new curriculum. This is done through a series of interviews and focus group discussions with the community members. The fifth step is the implementation of the new curriculum. This is done through a series of interviews and focus group discussions with the community members. The sixth step is the evaluation of the new curriculum. This is done through a series of interviews and focus group discussions with the community members.

[illegible]

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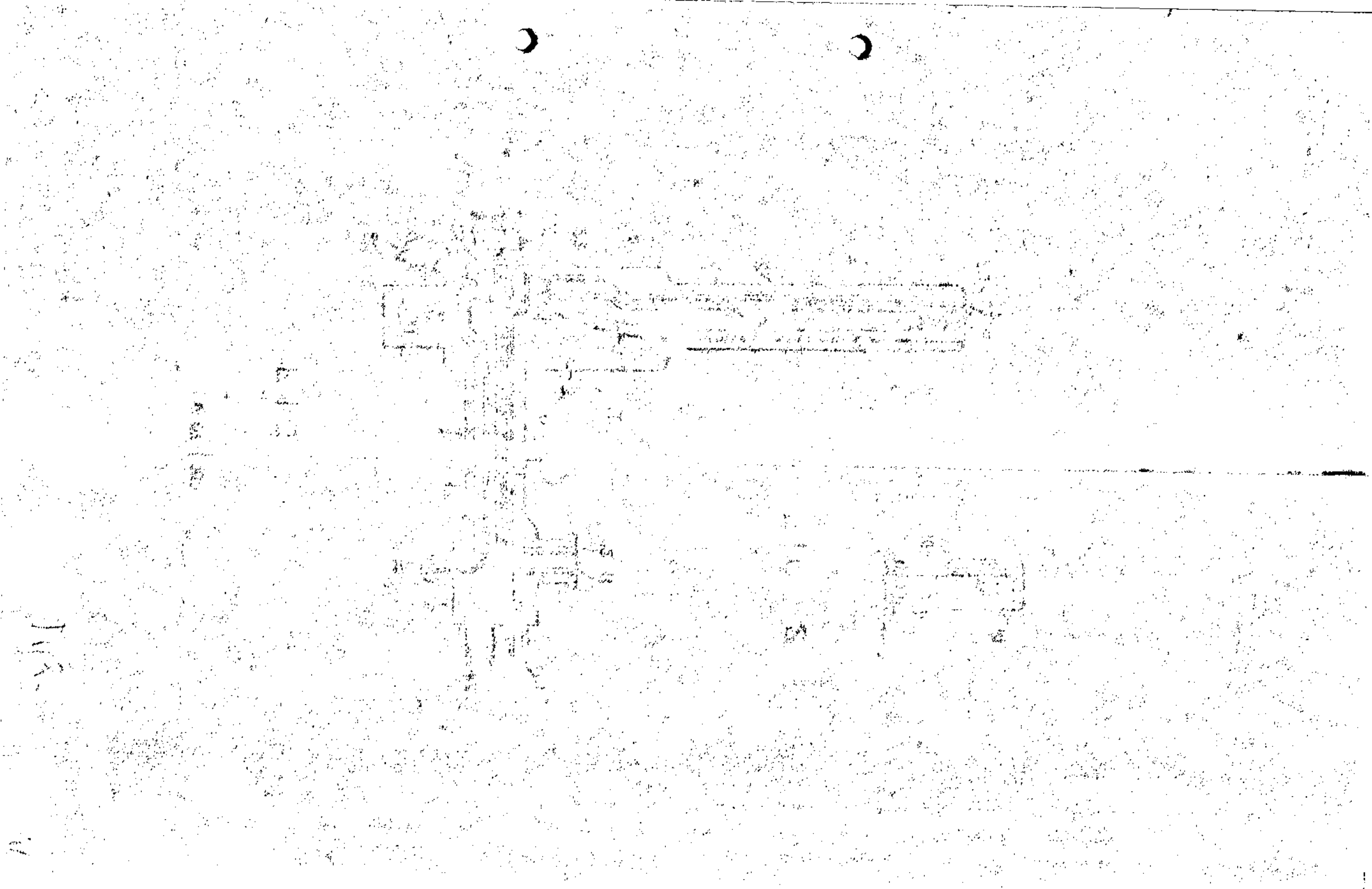
3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete each task.

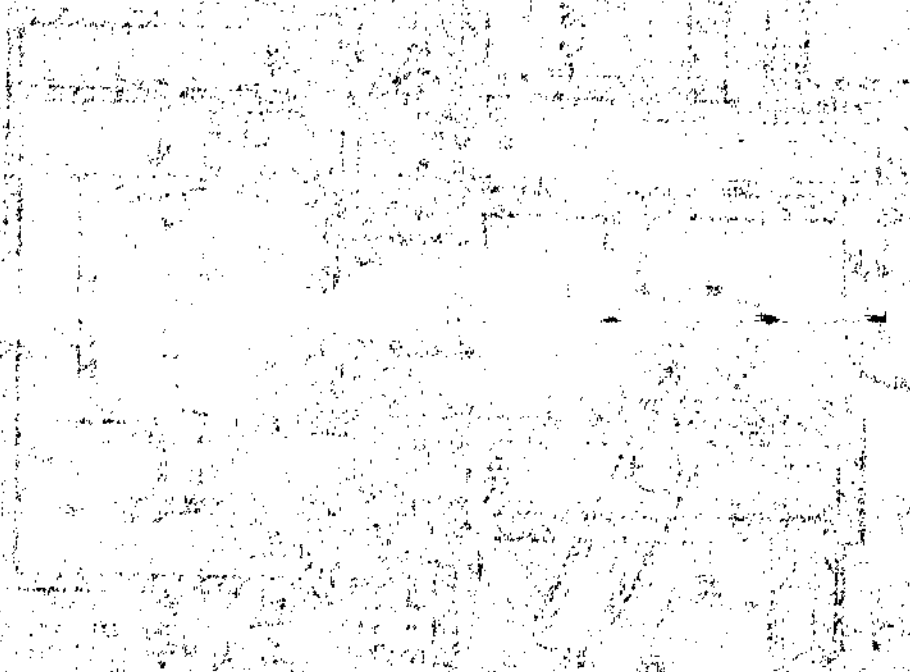
4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals and identifying any areas for improvement.

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 256. *Glossary*

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US005840251A

United States Patent [19]
Iwaki

[11] **Patent Number:** **5,840,251**
[45] **Date of Patent:** **Nov. 24, 1998**

DZ

[54] **DEVICE AND METHOD FOR CLEANING, DISINFECTING AND DRYING AN ENDOSCOPE**

[56] **References Cited**

[75] **Inventor:** Yasuo Iwaki, Moriyama, Japan
[73] **Assignee:** Nitto Medical Corporation, Osaka, Japan

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[21] **Appl. No.:** 742,061
[22] **Filed:** Oct. 31, 1996

Primary Examiner—W. Gary Jones
Assistant Examiner—Jeffrey Fredman
Attorney, Agent, or Firm—Whitham, Curtis & Whitham

[30] **Foreign Application Priority Data**

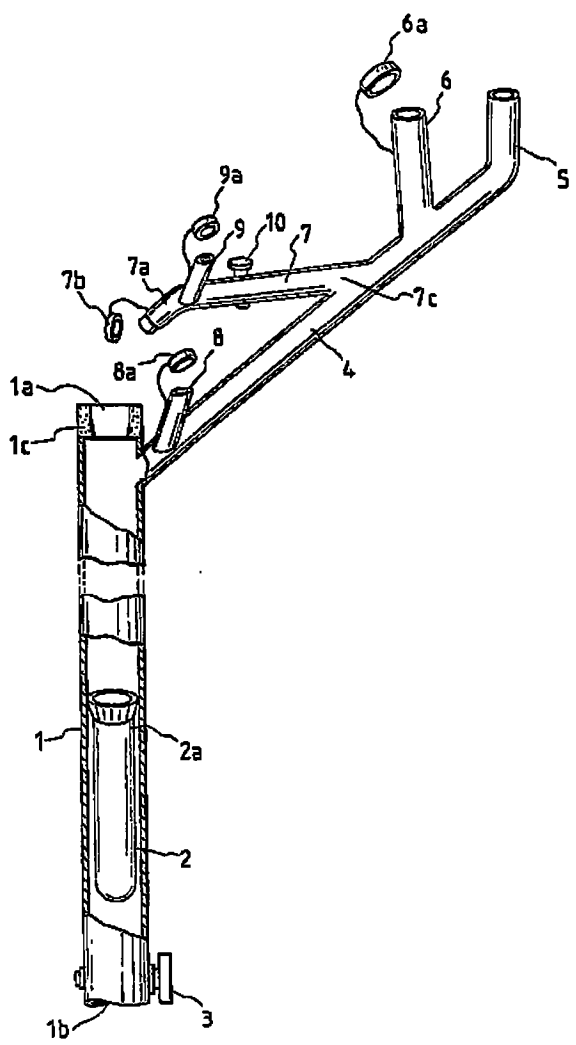
Oct. 31, 1995	[JP]	Japan	7-308378
Aug. 8, 1996	[JP]	Japan	8-227659

[57] **ABSTRACT**

[51] **Int. Cl.⁶** A01N 1/00; G05B 1/00; A61L 2/00; E04H 15/26
[52] **U.S. Cl.** 422/36; 422/105; 422/116; 422/294; 422/297; 422/300; 134/99.1; 134/104.2; 134/169 R; 134/170
[58] **Field of Search** 422/36, 297, 116, 422/294, 105, 300; 134/99, 104.2, 169, 170

A portion of the endoscope that has been withdrawn from the human body is inserted into the tubular body of the device and pressurized water, a liquid detergent, a liquid disinfectant and air are sequentially forced through a water injecting pipe, an inlet pipe and injection pipes that communicate with the tubular body, whereby not only the outer surface of the endoscope but also the inner ducts through it are cleaned, disinfected and dried in a convenient and safe manner.

19 Claims, 3 Drawing Sheets



120

THE UNITED STATES OF AMERICA
DEPARTMENT OF THE ARMY
WASHINGTON, D. C.

OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D. C.

MEMORANDUM FOR THE RECORD
SUBJECT: [Illegible]

1. [Illegible]

2. [Illegible]

3. [Illegible]

4. [Illegible]

5. [Illegible]

6. [Illegible]

7. [Illegible]

8. [Illegible]

9. [Illegible]

10. [Illegible]

11. [Illegible]

optionally followed by drying with pressure air in the manner already described above.

Since glutaraldehyde generates a toxic gas, its use involves a certain danger; however, according to the method just described above, the endoscope can be disinfected in a closed circuit without the risk of gas exposure. In addition to this safety feature, the immersion disinfection which is performed within the tubular system has the advantage that glutaraldehyde need be used in an amount which is less than a twentieth of the usual quantity, whereby the cost of disinfecting operations is significantly reduced.

As described on the foregoing pages, the present invention provides an inexpensive device with which an endoscope, as it has the connector portion coupled to a light source unit, can be cleaned, disinfected and dried in a convenient and safe manner once the endoscope is inserted into the tubular body of the device (i.e., without the need to detach or reinsert the endoscope for performing the individual operations). Thus, the invention offers great benefits not only to medical staff concerned with the operation of endoscopes but also to the many patients examined with endoscopes.

What is claimed is:

1. A device for cleaning, disinfecting and drying an endoscope, said endoscope having an insertion portion for being inserted into a patient and a forceps socket, said device comprising:

a tubular body having a top, a bottom opposite said top, an upper part adjacent said top, a lower part adjacent said bottom, an outlet at said bottom and an opening at said top, said opening receiving said insertion portion of said endoscope;

a water inlet pipe extending from said upper part of said tubular body;

a branch pipe branching from said inlet pipe and connecting to said forceps socket of said endoscope;

at least one injection pipe extending from at least one of said inlet pipe and said branch pipe, said at least one injecting pipe injecting at least one of air, a detergent and a disinfectant; and

a fluid reservoir positioned within said tubular body at said lower part, said fluid reservoir receiving said insertion portion of said endoscope.

2. The device for cleaning, disinfecting and drying an endoscope according to claim 1, further comprising a rubber seal ring connected to said opening of said tubular body.

3. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said endoscope includes a tapered portion, and;

said opening further including an inclined inner surface for contacting said tapered portion of said endoscope.

4. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said fluid reservoir includes a top having a funnel shape, said top including a flared mouth having a plurality of effluent holes.

5. The device for cleaning, disinfecting and drying an endoscope according to claim 1, further comprising a valve positioned between said fluid reservoir and said outlet, said valve regulating and stopping an effluent flow.

6. The device for cleaning, disinfecting and drying an endoscope according to claim 1, further comprising a rubber stopper for closing said outlet.

7. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said tubular body, inlet pipe, branch pipe and fluid reservoir comprise a transparent, flexible synthetic resin,

said tubular body allowing an exterior and an interior of said endoscope to be cleaned simultaneously.

8. The device for cleaning, disinfecting and drying an endoscope according to claim 7, wherein said tubular body, inlet pipe, branch pipe and fluid reservoir comprise one of polyethylene, polyvinyl resin, polypropylene, polycarbonate, polyester, polystyrene, silicone, polyvinylidene chloride and polyvinyl acetate.

9. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said tubular body has an inner diameter of 10 to 17 mm and said insertion portion of said endoscope has an outer diameter of 3 to 10 mm.

10. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said tubular body has an inner diameter of 17 to 23 mm and said insertion portion of said endoscope has an outer diameter greater than 10 mm.

11. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said tubular body comprises a material having a thickness of no more than 1 mm.

12. The device for cleaning, disinfecting and drying an endoscope according to claim 1, wherein said inlet pipe includes a first end adjacent said tubular body and a second end opposite said first end, said device having a plurality of said injection pipes including:

a first injection pipe, extending from said second end of said inlet pipe, through which air is supplied under pressure;

a second injection pipe, extending from about said first end of said inlet pipe through which said detergent and said disinfectant are supplied; and

a third injection pipe, extending from said branch pipe through which said detergent and said disinfectant are supplied.

13. The device for cleaning, disinfecting and drying an endoscope according to claim 12, further comprising a stop valve positioned on said branch pipe between said inlet pipe and said third injection pipe.

14. The device for cleaning, disinfecting and drying an endoscope according to claim 12, further comprising a tube comprising silicone rubber connected to said branch pipe.

15. A method of cleaning, disinfecting and drying an endoscope comprising:

inserting a portion of an endoscope that has been withdrawn from a human body into a top receptacle of a tubular body;

supplying pressurized water into a first path connected to the tubular body and into a second path connected to a forceps duct running through the endoscope, said water washing the tubular body and the forceps duct;

providing means for collecting the water around a suction port at a distal end of the inserted portion of the endoscope;

applying suction onto the water via the suction port to wash a suction duct running through the endoscope;

injecting a detergent into said tubular body, said detergent cleaning an outer surface of the inserted portion and the forceps duct of the endoscope;

providing means for collecting the detergent in an area around the suction port;

applying suction onto the detergent thereby cleaning the suction duct;

injecting a disinfectant into said tubular body, said disinfectant disinfecting the outer surface of the inserted portion of the endoscope and the forceps duct of the endoscope;

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the situation.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a formal address, and it is the first of its kind since the signing of the Constitution. The President, James Buchanan, is addressing the Congress, and he is doing so in a very formal and dignified manner. He is discussing the state of the Union, and he is discussing the issues that are facing the country at that time. He is also discussing the role of the President, and he is discussing the responsibilities of the Congress.

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5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals and identifying any lessons learned for future projects.

1. The first step in the process of identifying a problem is to recognize that a problem exists. This is often done by comparing current performance with a desired state or goal. If there is a significant difference, a problem is identified.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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THE UNITED STATES OF AMERICA
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF STAFF

IN WASHINGTON, D. C.
JANUARY 10, 1945

MEMORANDUM FOR THE CHIEF OF STAFF
SUBJECT: [Illegible]

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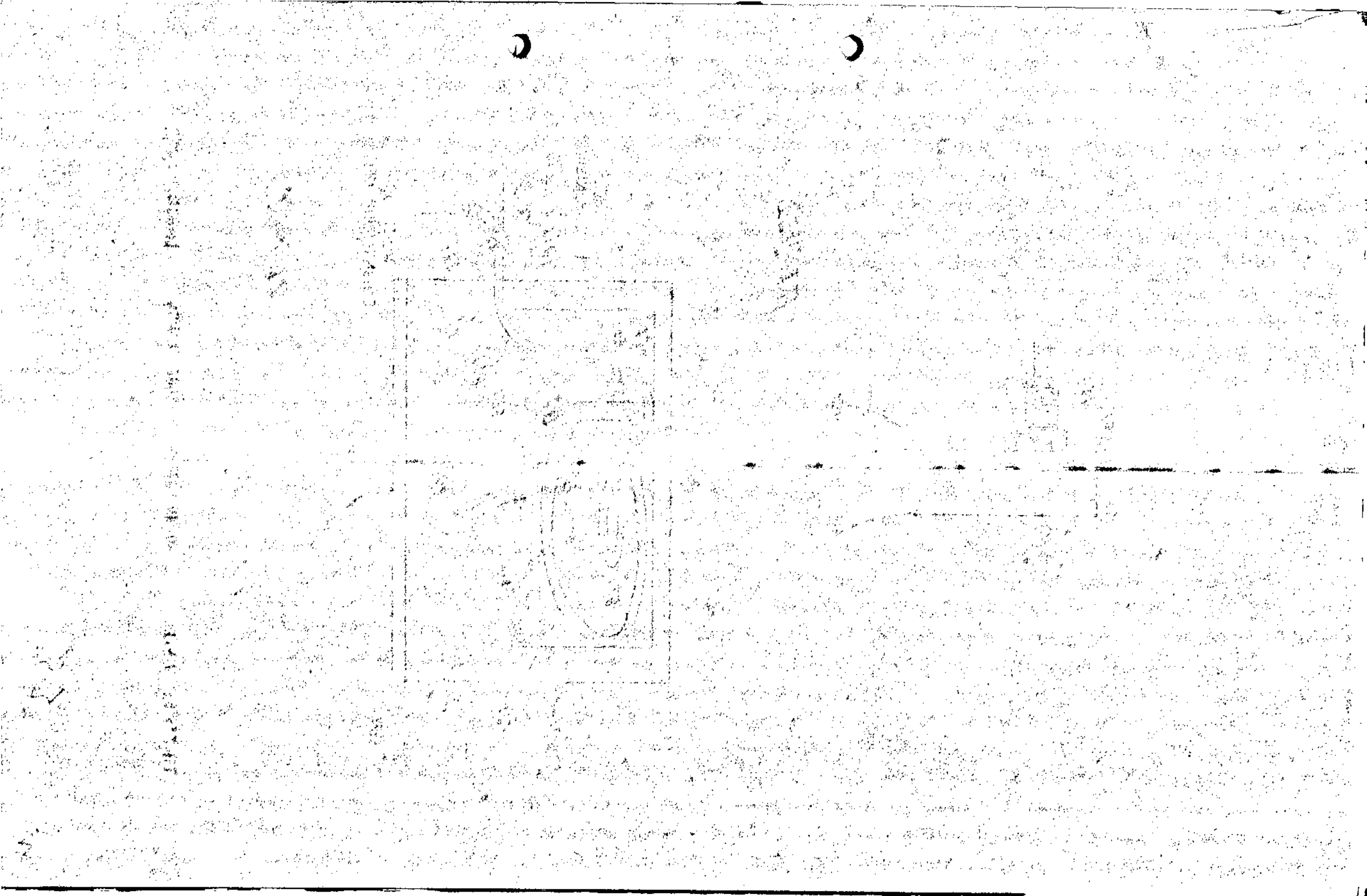
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provided by applying a pressure over the upper plate 196 and moving the piston body 195 in the first direction 233. As expected, when the pressure is completely relieved, the piston moves in a second direction 235 until the lower plate 198 rests against the locator ring 212.

Referring to FIG. 4, in this embodiment, the inner bore 204 comprises a valve 206 which is preferably comprised of a ball 222 and a valve spring 224. As will be explained more fully below, the valve 206 allows fluid communication between the fluid source and the endoscope 120 when the fluid pressure in the upper section 155 of the central bore 153 is high enough to dislodge the ball and hence open the valve 206. The upper portion of the inner bore 204 is narrowed towards the upper aperture 208 by a tapered portion 226 where the ball 222 of the valve 206 is received. The diameter of the ball 222 is larger than the diameter of the upper aperture 208. The lower portion of the inner bore 204 is narrowed by a radial seat 228 on which the valve spring rests as in the manner shown in FIG. 4. At rest, the valve spring 224 urges the ball 222 against the upper aperture 208 and provides a secure seal with the upper aperture 208 of the inner bore 204.

The operation of the connector 119 is as follows:

Referring to FIGS. 1A-1B the endoscope device 120 is placed into the tray 122 in the inner chamber 104 of the chamber 102. According to principles of the present invention, the tray 122 may also comprise some fluid. The connection between the endoscope 120 and the system 100 can be established through the connector 119 of the present embodiment. As discussed above, the connector 119 contains a connection compartment 154 to receive the port 134 of the endoscope 120. The port 134 is admitted into the connection compartment 154 by opening the entrance 177 and sliding the lip portion 138 of the port 134 through the horizontal slots 176 of the connection compartment 154. In order to open the entrance 177 the lock plate 180 is moved against the spring housing 186 of the lock assembly 162. Once the port 134 is placed into the compartment 154, the lock plate 180 is released to close the entrance 177 and to retain the port 134 in the connection compartment 154. Upon connecting the connector 119 to the port 134, the chamber 102 is sealed for the cleaning and sterilization process.

FIG. 5A illustrates the connection between the port 134 and the connector 119 while also showing the relative orientation of the piston surface 232 of the piston body 195 to the sealing surface 140 at an initial fluid pressure. At this initial pressure level, the piston body 195 is in a first position so that the piston surface 232 is not in contact with the sealing surface 140 of the port 134. Further, at this initial pressure, the valve 206 remains in its off state and closes off any fluid flow between the upper portion 155 of the central bore 153 and the connection compartment 154 through the valve housing 204. Thus, the initial pressure is not high enough to move the piston assembly downwards or to displace the ball 222 of the valve 206 from its fluid tight fit against the upper aperture 208 of the inner bore 204. As opposed to prior art connectors, in its loosely connected state, the connector 119 allows fluid from the tray 122 (See FIG. 1A) to flow around and sterilize and clean the outer surface 144 of the port 134. The agitation of the fluid in the chamber enhances the cleaning and sterilization of the areas around the piston surface and the sealing surface. As discussed in the background section, the prior art connectors cause occluded areas at the connection surfaces such as the sealing surface 140, side surface 141 and track surface 142 of the port 134. In the prior art, such occluded areas require another cleaning and sterilization step to treat the occluded areas.

FIG. 5B shows the connector 119 at an intermediate fluid pressure where the piston body 195 is urged into a lower position (in the direction of arrow 233) wherein the o-ring 236 on the piston surface 232 is in contact with the sealing surface 140 of the port 134. In this second position, the sealed state between the o-ring 236 and the sealing surface 140 prevents any fluid flow between the piston surface 232 and the sealing surface 140, thereby occluding the sealing surface 140. As in the previous pressure level, the ball 222 remains seated at the upper aperture 208 of the inner bore 204 and thus prevents any fluid flow into or out of the port 134.

As illustrated in FIG. 5C, the connector 119 is at a high fluid pressure when the piston body 195 is still at the lower position where the o-ring 236 on the piston surface 232 is in contact with the sealing surface 140. However, this increased pressure level opens the valve 206 by overcoming the strength of the spring 224 and then moving the ball 222 downward (in the direction of arrow 233) in the valve housing 204 thereby allowing fluid flow into the endoscope 120. As understood, the movement of the piston body 195 is closely related to the strength of the spring 202, while the action of the valve 206 depends on the strength of the valve spring 224. If the compressive force required to compress the valve spring 224 is less than the compressive force required to compress the spring 202, the valve 206 opens before the piston body 195 is urged into a lower position, and initiates the fluid flow over the occluded areas.

It is to be understood that the pressure activated device described above can include a solenoid or pneumatic device.

The system of the present embodiment allows for the operator to perform cleaning and/or sterilization without creating occluded areas between the connector 119 and the lumen device. It will be understood that the present invention is susceptible to modification in order to adapt it to different uses and conditions. In order to better describe the concept of the alternative embodiments and to clearly indicate the corresponding modifications on the connector 119, the following embodiments will be described with the assistance of simplified illustrations. In this respect, the connector 119 of the present invention, as shown in FIG. 5, will be briefly redescribed using a simplified illustration of the connector 119 shown in FIG. 6.

FIG. 6 shows the connector 119 which is connected to the port 134 of the endoscope 120. As described above, the connector 119 comprises the housing 149 having the lower end 150, the upper end 151 and the central bore 153. The lower end 150 of the housing 149 comprises the connection compartment 154 where the port 134 of the endoscope is received. The lateral openings 171 of the connection compartment 154 allow an outside fluid, such as the solution in the tray 122 (See FIG. 1A), to enter into the connection compartment 154 and contact the outer surface 144 of the port 134. The solution may be a cleaning, rinsing, disinfectant and sterilization solution. The upper end 151 of the housing 149 comprises the tubing connector 158 so that the upper portion 155 of the central bore 153 is connected to the inner conduit 118 which is also connected to the fluid source (not shown).

The central bore 153 comprises the piston assembly 194 which is centered within the central bore 153. The piston assembly 194 comprises the piston body 195 having upper and lower plates 196 and 198, and the piston spring 202, which is concentrically placed around the piston body 195 and in the coaxial spring housing 220. The inner bore 204 comprises the valve 206 and is centrally longitudinally

1. The first step in the process is to identify the problem. This involves gathering information about the situation and understanding the needs of the stakeholders involved.

2. Once the problem is identified, the next step is to develop a plan. This involves setting goals, identifying resources, and determining the steps that need to be taken to address the problem.

3. The third step is to implement the plan. This involves putting the plan into action and monitoring progress to ensure that the goals are being met.

4. Finally, the fourth step is to evaluate the results. This involves assessing the effectiveness of the plan and making adjustments as needed to improve the outcome.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete them.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals and identifying any areas for improvement.

1. The first step in the process of creating a new product is to identify a market need. This involves conducting market research to understand the preferences and behaviors of potential customers. Once a need is identified, the next step is to develop a concept that addresses this need. This concept should be innovative and differentiated from existing products in the market.

2. After developing a concept, the next step is to create a prototype. This allows the development team to visualize the product and test its functionality. Prototyping can be done using various methods, such as 3D printing or building a physical model. The prototype is used to gather feedback from potential users and make necessary adjustments to the design.

3. Once the prototype is refined, the next step is to conduct a feasibility study. This study evaluates the technical, financial, and market viability of the product. It involves assessing the resources required for production, the potential costs, and the competitive landscape. This step helps in making informed decisions about whether to proceed with the product development.

4. The final step in the process is to launch the product into the market. This involves creating a marketing strategy to promote the product and reach the target audience. The launch is typically followed by a period of monitoring and evaluation to assess the product's performance and gather customer feedback. This feedback is used to make improvements and refine the product over time.

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2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete each task.

4. The fourth step is to implement the plan. This involves assigning tasks to team members, setting deadlines, and monitoring progress. It is important to communicate regularly and provide support to team members throughout the process.

5. The final step is to evaluate the results of the project. This involves comparing the actual outcomes to the objectives and goals defined at the beginning. It is important to identify any areas for improvement and learn from the experience for future projects.

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals and identifying any areas for improvement.

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.

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4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves comparing the actual outcomes with the objectives and goals to determine the effectiveness of the project and identify areas for improvement.

This image shows a highly textured surface, likely the cover or endpaper of an old book. The texture is characterized by a dense, irregular pattern of small, dark, and light-colored specks and fibers. The overall appearance is grainy and aged, with a mottled distribution of tones ranging from light gray to dark black. There are no discernible text, figures, or other markings on the surface.

located within the piston body 195. The inner bore 204 extends between the upper aperture 208 located at the upper end 196 of the piston body 195 and the lower aperture 210 located at the lower end 198 of the piston body 195. The inner bore 204 connects the upper portion 155 of the central bore 153 to the connection compartment 154. The valve 206 is positioned within the inner bore 204 and comprises the ball 222 and the valve spring 224. The valve spring 224 urges the ball 222 towards the upper aperture 208 and forms a fluid tight seal therein. The lower end 198 of the piston body comprises a piston surface 132 to sealably contact with the sealing surface 140 of the port 134 when the piston body 195 is moved toward the sealing surface 140 with the increasing fluid pressure as in the manner described above.

FIG. 7 shows a second embodiment of the connector 119 of the present invention. In this embodiment, the connector 119 comprises a housing 149 having lower and upper ends 150 and 151, and a central bore 153. The lower end 150 of the housing 149 comprises the connection compartment 154 where the port 134 of the endoscope 120 is received so that the endoscope 120 can be connected to the connector 119. As in the previous embodiment, lateral openings 171 around the connection compartment 154 allow an outside fluid, such as a sterilizing solution in the tray 122 (See FIG. 1A), to enter into the connection compartment 154 so as to treat the outer surface 144 of the port 134. The upper end 151 of the housing 149 comprises a tubing connector 158 to connect the fluid source (not shown) to the connector 119.

The central bore 153 comprises a piston assembly 194 which is centered within the central bore 153. The piston assembly comprises a piston body 195 with an upper plate 196, a lower plate 198 and an inner bore 204. The inner bore 204 extends along the body 195 and between the upper aperture 208 defined by the upper plate 196 and the lower aperture 210 defined by the lower plate 198. A piston spring 202 is concentrically placed around the piston body 195 and in the spring housing 220. The inner bore 204 connects the upper portion 155 of the central bore 153 to the connection compartment 154 so that when the connector 119 is connected to the endoscope port 134 a fluid communication between the endoscope 120 and the fluid source (not shown) can be established. As shown in FIG. 7, as a departure from the first embodiment, the inner bore 204 does not contain a valve. The lower plate 198 of the piston body comprises the piston surface 132 to sealably contact with the sealing surface 140 of the port 134 when the piston body 195 is moved towards the sealing surface 140.

During the operation, the piston body 195 is moved by the flow rate of the fluid so that at a predetermined reduced flow rate the piston body remains at its initial position as in the manner shown in FIG. 7. At this reduced flow rate, the fluid flows through the inner bore 204 so as to clean and sterilize the sealing surface 140. However, as the flow rate of the fluid is increased toward a higher flow rate, the pressure over the piston body 195 and, hence, the compressive force over the spring 202 increases. As a result, at a predetermined higher flow rate, the piston body moves toward the port 134 (in the direction of arrow 233) to seal the connection between the port 134 and the connector 119, while still allowing fluid to flow through the inner bore 204. When the piston surface 132 seals the sealing surface 140, as in the manner described above, fluid from the fluid source flows into the endoscope 120. In this embodiment, the compressive force on the spring 202 determines the flow rate necessary to seal the port 134.

FIG. 8 shows a third embodiment of the connector 119 of the present invention. The connector 119 comprises a hous-

ing 149 having lower and upper ends 150 and 151, and a central bore 153. The lower end 150 of the housing 149 comprises the connection compartment 154 where the port 134 of the endoscope 120 is received so that the endoscope 120 can be connected to the connector 119. As in the previous embodiment, lateral openings 171 around the connection compartment 154 allow an outside fluid, such as a sterilizing solution in the tray 122 (See FIG. 1A), to enter into the connection compartment 154 so as to treat the outer surface 144 of the port. The upper end 151 of the housing 149 comprises a tubing connector 158 to connect the fluid source (not shown) to the connector 119.

In this embodiment, the central bore 153 comprises a piston assembly 194. As in the previous embodiments, the piston assembly 194 comprises a piston body 195 having an inner bore 204. However, in this embodiment, the piston body 195 may comprise an extension portion 242 attached to the piston body 195, as in the manner shown in FIG. 8. A side wall 244 of the extension portion 242 extends peripherally perpendicularly from an upper aperture 208 defined by an upper plate 196 of the piston body 195 (See, FIG. 7). In this configuration, the inner bore 204 may continuously extend from a lower aperture 210 defined by the lower plate 198 to an aperture 246 defined by the upper end of the side wall 242 of the extension portion 240. In this embodiment, the aperture 246 will be referred to as the upper aperture of the inner bore 204 hereafter. The lower plate 198 of the piston body comprises the piston surface 132 to sealably contact with the sealing surface 140 of the port 134 when the piston body 195 moves toward the sealing surface 140.

A piston spring 202 is concentrically placed around the piston body 195 and in the spring housing 220. The piston spring 202 biases the piston body 195 toward a second direction 235. In particular, in this embodiment, an annular plate 248 encloses a pressure chamber 250 above the upper plate 196. The pressure chamber can be alternatively placed under vacuum or pressure. As shown in FIG. 8, the annular plate 248 is placed about the extension portion 240 and is appropriately sized to permit the extension portion 240 to slip freely through the annular plate 248. A circumferential sealing edge 252 may be arranged on the annular plate and between the annular plate 248 and the extension portion 240 so as to provide a sealable contact between the annular plate 248 and the wall 242 of the extension portion 240. The annular plate 248 can be attached to the inner bore using suitable means, such as gluing, as in the manner shown in FIG. 8. A flow orifice 254 through the connector housing 149 connects the pressure chamber 250 to a fluid source. When the pressure chamber 250 is filled with a fluid from the fluid source (not shown), the pressure of the fluid urges the piston body in the first direction 233.

During the operation, the piston body 195 is moved by the fluid pressure in the pressure chamber 250. In this embodiment, at the beginning of the process, the fluid may be flown through the inner bore 204 so as to pretreat the outer surface 144 of the port 134. Since the port 134 is loosely connected to the connector 119, the fluid cleans and sterilizes the outer surface 144. The pressure in the pressure chamber is then increased to urge the piston toward the port 134 until the piston surface 132 comes in contact with the sealing surface 140 thereby sealing the connection between the connector 119 and the port 134. This allows sterilant fluid from the fluid source to flow into the endoscope 120. In this embodiment, upon completion of the process, the pressure in the chamber 250 is relieved which results in the piston body moving back as a result of the compressive force on the spring 202.

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