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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 77



-Top Ranked Chambers Latin America 2012
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Industria y Comercio

SUPERINTENDENCIA

DELEGATURA DE NUEVAS CREACIONES

SOLICITUD FASE NACIONAL -PCT

21. EXPEDIENTE No. _____

54. TITULO: COBERTURA PARA UNA TAPA DE
VÁLVULA DE UN CILINDRO DE GAS

51. CLASIFICACION INTERNACIONAL:

A61M 16/20 (2006.01) F17C 13/06 (2006.01)

71. SOLICITANTE:

LINDE AG

DOMICILIO:

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22. BOGOTÁ D.C., ABRIL 21 DE 2014



Industria y Comercio
SUPERINTENDENCIA

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 14-084343- -00000-0000

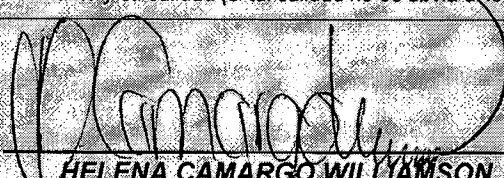
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DIRECCIÓN DE NUEVAS CREACIONES
SOLICITUD FASE NACIONAL –PCT

1	TIPO DE SOLICITUD	☒ Patente de invención ☒ Capítulo I	☐ Patente de Modelo de Utilidad ☐ Capítulo II
2	DATOS SOLICITUD INTERNACIONAL PCT (86)		
Solicitud Internacional No.		PCT/EP2012/071129	Fecha 25/10/2012
Publicación Internacional No.		WO 2013/060765 A1	Fecha 02/05/2013
3	TÍTULO DE LA INVENCIÓN (200 caracteres o espacios máximos)		
COBERTURA PARA UNA TAPA DE VÁLVULA DE UN CILINDRO DE GAS			
4	CLASIFICACIÓN INTERNACIONAL (CIP)		
A61M 16/20 (2006.01) F17C 13/06 (2006.01)			
SOLICITANTE (S) Esta persona también es inventor. Para datos adicionales utilizar hoja de información complementaria			
1	APellidos o razón social	NOMBRE	IDENTIFICACIÓN TIPO
LINDE AG			
6	DATOS DEL SOLICITANTE		
DIRECCIÓN		No. TELÉFONO	
CIUDAD		CORREO ELECTRÓNICO	
DEPARTAMENTO/ESTADO		NACIONALIDAD O LUGAR DE CONSTITUCIÓN	
PAÍS DE RESIDENCIA		ALEMANIA ALEMANIA	
7	INVENTOR (ES) Para datos adicionales utilizar hoja de información complementaria		
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☐ Los demás solicitantes y/o (demás) inventores se indican en una hoja a continuación.			
9	☐ REPRESENTANTE LEGAL ☒ APODERADO		
APELLIDOS		NOMBRES	IDENTIFICACIÓN
CAMARGO WILLIAMSON		HELENA	C.C 35.455.268 de Bogota T.P 76985
DIRECCIÓN		No. TELÉFONO	
CIUDAD		CORREO ELECTRÓNICO	
PAÍS		No. RADICACIÓN DE PROTOCOLO DE PODER GENERAL	
CARRERA 7 N° 71 – 52, TORRE A, PISO 5		3257300	
BOGOTÁ		helena.camargo@phrlegal.com	
COLOMBIA			
10	DECLARACIONES DE PRIORIDAD ☒ SI ☐ NO		

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1. COMUNIDAD EUROPEA			11186984.8	27/10/2011
11 DECLARACIÓN SOBRE USO DE RECURSOS GENÉTICOS O BIOLÓGICOS				
Declaro que el objeto de la presente solicitud de patente fue obtenido a partir de recursos genéticos o biológicos de los que cualquiera de los países miembros de la Comunidad Andina es país de origen.				
☐ SI ☒ NO				
Nota: En caso afirmativo deberá anexar copia del contrato de acceso de recursos genéticos o productos derivados, o certificado o número de registro, expedido por la Autoridad competente.				
12 DECLARACIÓN SOBRE USO DE CONOCIMIENTOS TRADICIONALES				
Declaro que el objeto de la presente solicitud de patente fue obtenido a partir de conocimientos tradicionales de comunidades indígenas, afroamericanas o locales de países miembros de la Comunidad Andina.				
☐ SI ☒ NO				
Nota: En caso afirmativo deberá anexar la licencia o autorización de uso de conocimiento tradicional, o certificado, o número de registro expedido por la Autoridad competente.				
13 REDUCCIÓN DE TASAS				
Declaro que carezco de medios económicos para presentar la solicitud de patente.				
☐ SI ☒ NO				
Nota: En caso de ser persona natural y carecer de medios económicos, y por lo tanto, aplique la reducción de tasas a que se refiere la resolución vigente en tarifas, debe firmar la presente solicitud bajo la gravedad de juramento.				
Micro, pequeñas y medianas empresas ☐				
Universidades públicas o privadas ☐				
Entidades sin ánimo de lucro ☐				
Debe aportar los documentos que se indican en el numeral 17 de anexos				
14 AUTORIZACIÓN DE NOTIFICACIÓN EN LÍNEA ☒ SI ☐ NO				
Manifiesto que he leído y entendido perfectamente los términos y condiciones de uso de medios electrónicos para las notificaciones en línea a través de Internet de los actos administrativos proferidos por la Superintendencia de Industria y Comercio que deben ser notificados personalmente y, en consecuencia, autorizo el servicio de notificación a través de internet.				
15 COMPROBANTE DE PAGO O PAGO ELECTRÓNICO		N°	Fecha	
16 FIRMA DEL SOLICITANTE, DEL APODERADO O DEL REPRESENTANTE LEGAL				
Junto a cada firma, indicar el nombre del firmante y su calidad (si tal calidad no es obvia al leer el petitorio)				
 HELENA CAMARGO WILLIAMSON				
17 ANEXOS				
Documentación Técnica Solicitud Internacional en castellano		Documentación Jurídica		
1. ☒ Descripción N° de folios:		9. ☒ Poderes, si fuera el caso,		
2. ☒ Reivindicaciones N° Reivindicaciones:		10. ☐ Documento que legalmente pruebe la cesión del inventor al solicitante o a su causante.		
3. ☒ Dibujos y/o figuras N° folios:		11. ☐ Copia del contrato de acceso de recursos genéticos o productos derivados, certificado o número de registro, si fuera el caso.		
4. ☒ Resumen.		12. ☐ Copia de la licencia o autorización de Conocimientos Tradicionales, certificado o número de registro, si fuera el caso.		
5. ☐ Certificado de depósito de material biológico si fuera el caso.		13. Reducción de tasas		
6. ☐ Listado de secuencias de nucleótidos y/o aminoácidos en forma digital si fuera el caso.		Micro, pequeñas o medianas empresas		
7. ☒ Arte final 12 x 12.		☐ Copia simple de la declaración de renta del año inmediatamente anterior, o en su defecto prueba documental idónea.		
8. ☐ Anexo formato digital.		☐ Documento de constancia de cumplimiento con lo establecido en la ley 905 de 2004.		
		Universidades públicas o privadas		
		☐ Copia acto de reconocimiento institucional emitido por el Ministerio de Educación		
		Entidades sin ánimo de lucro		
		☐ Copia de registro vigente en Cámara de comercio.		
		☐ Hoja de información complementaria.		
		☐ Otros, especificar		
		14. ☒ Comprobante de pago de la tasa de presentación de la solicitud.		
		15. ☐ Comprobante de pago por reivindicación de prioridad.		
		16. ☐ Comprobante de pago de la tasa por concepto de excedente de palabras en la publicación.		
		17. ☒ Comprobante de pago por reivindicación adicional a 10.		

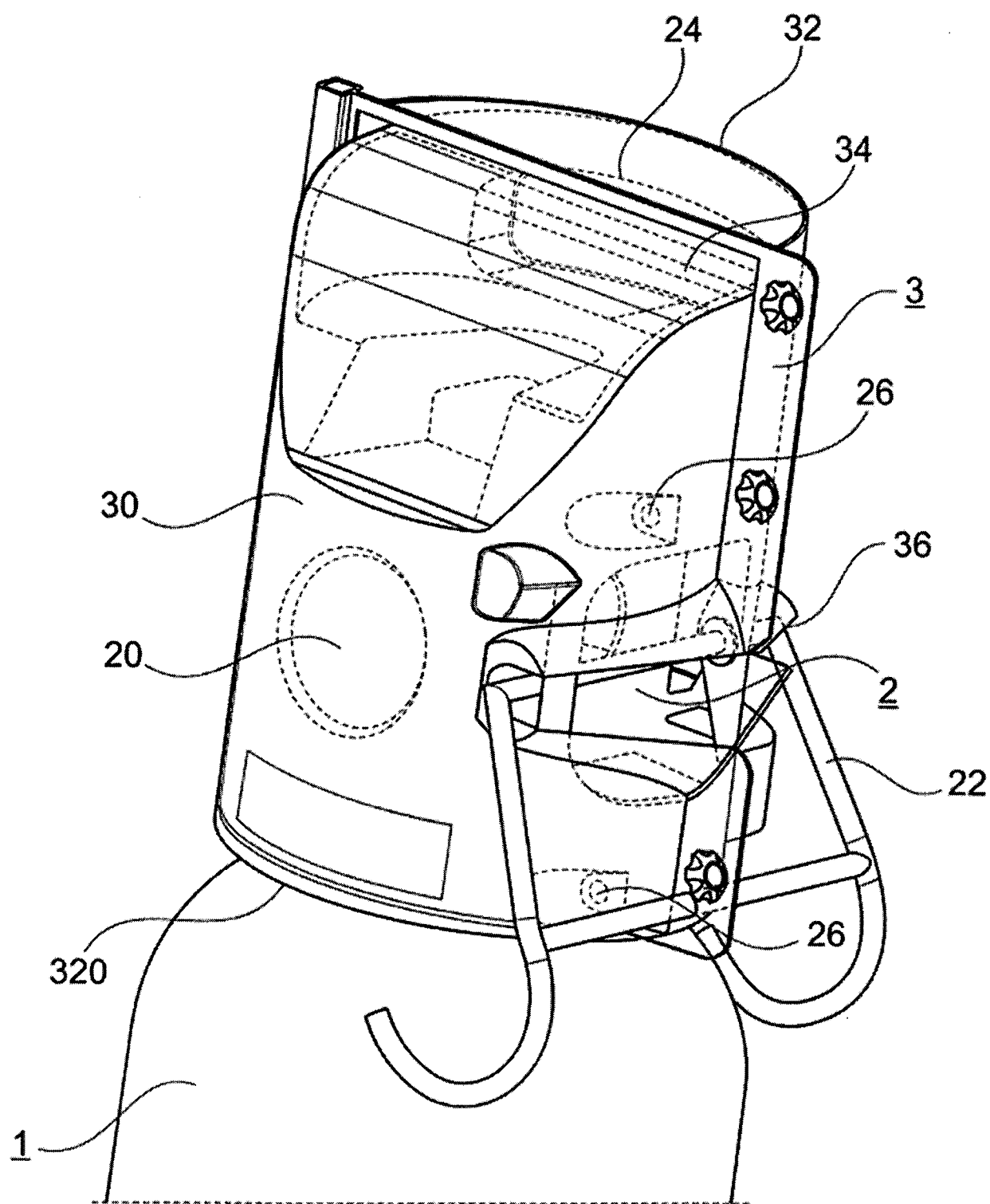


Fig. 1

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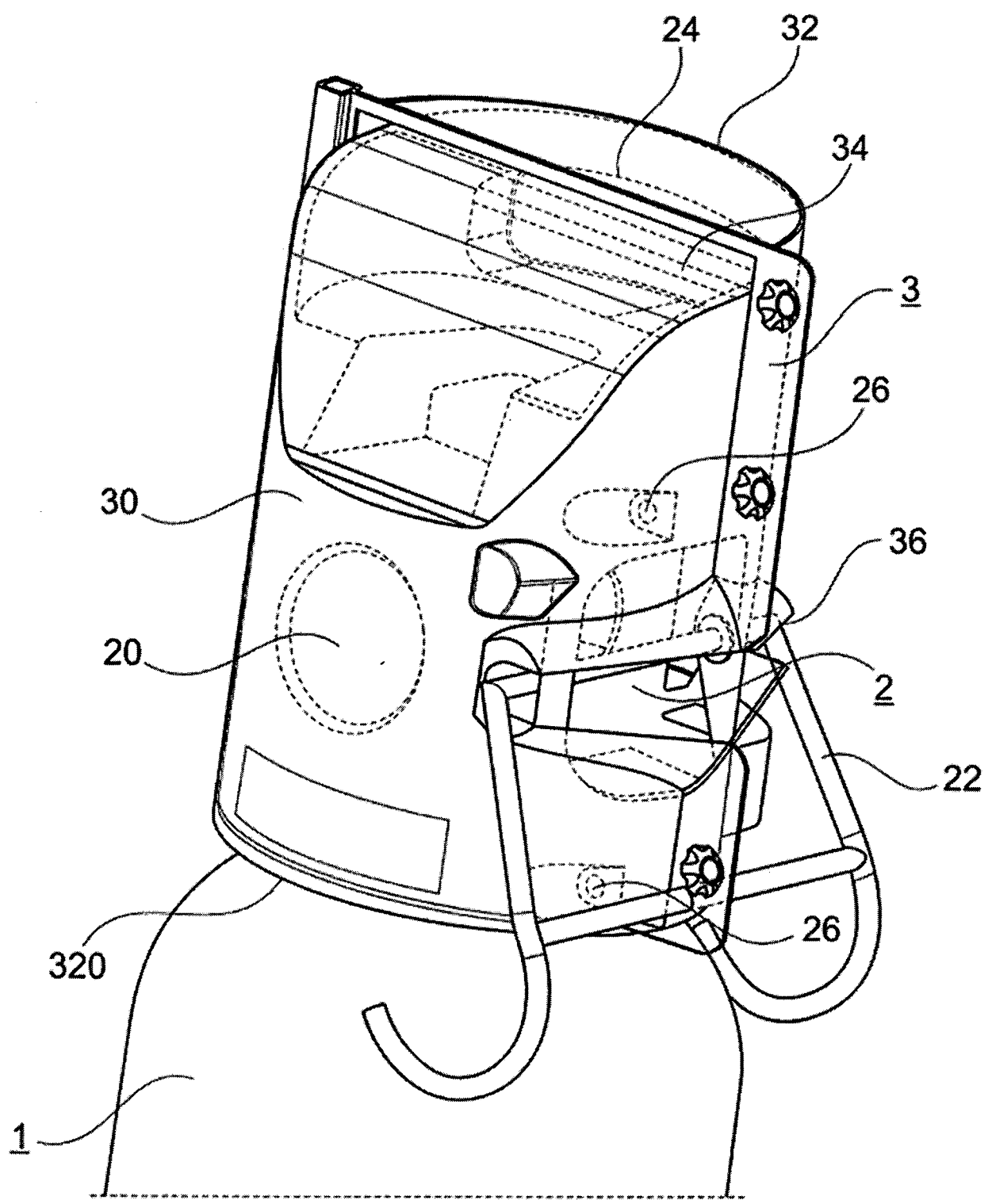


Fig. 1

Linde AG

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Cobertura para una tapa de válvula de un cilindro de gas

Área Técnica

10 La presente invención se refiere a una cobertura para una tapa de válvula de un cilindro de gas, preferentemente a una cobertura para una tapa de válvula de un cilindro de gas portátil que contiene gases medicinales.

Antecedentes Tecnológicos

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En el campo de la distribución de gases medicinales se sabe que los gases son distribuidos por medio de cilindros de gas. Los gases medicinales especializados tales como el helio o el óxido nitroso o gases medicinales estándar, tales como oxígeno y aire medicinal son distribuidos a los respectivos hospitales o centros de tratamiento en cilindros de gas. En un canal de distribución alternativo, los cilindros de gas son entregados directamente a la casa de un paciente con el fin de ser utilizados en aplicaciones de cuidado en hogar. Los cilindros de gas se conectan ya sea a un sistema de tuberías en el hospital o en un vehículo de emergencia, o se utilizan directamente en el sitio de administración, por ejemplo, directamente en la cama de un paciente.

25 En este último caso, los cilindros de gas son preferentemente relativamente pequeños de tal manera que son fáciles de transportar. La provisión de cilindros de gas portátiles obvia la necesidad de proporcionar salidas de gas de un sistema de tuberías de hospital a la cama del paciente y/o ofrece la posibilidad de trasladar el paciente respectivo fácilmente dentro del hospital sin interrumpir el suministro de gas debido a que el cilindro de gas puede ser movido junto con la cama del paciente.

30 Además, los cilindros de gas portátiles se pueden suspender fácilmente en la proximidad de la cama del paciente por medio de un gancho provisto en el cilindro de gas que puede ser conectado a una estructura de la cama del paciente.

Los cilindros de gas que son utilizados en el campo de la medicina están típicamente equipados con una estructura de válvula específica que está asegurada de manera fija a la porción de salida del cilindro de gas de tal manera que el usuario puede comenzar a administrar el gas desde el cilindro de gas inmediatamente y sin necesidad de montar cualquier componente de válvula al cilindro de gas, tal como un regulador de presión. Al mismo tiempo, el proveedor del cilindro de gas puede estar seguro de que la estructura de válvula se adapta a las especificaciones específicas del gas respectivo. Con el fin de mejorar la integridad mecánica y con el fin de salvaguardar la estructura delicada de la válvula, el cilindro de gas lleva normalmente una tapa de válvula alrededor de la estructura de la válvula donde

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esta tapa de válvula está normalmente unida de manera fija al cilindro de gas y/o a la estructura de válvula.

Una tal tapa de válvula convencional de un cilindro de gas por lo general tiene varias aberturas a través de las cuales se puede acceder a la estructura de válvula de forma tal que una salida de gas y un volante para la apertura y el cierre de la válvula son accesibles mientras que la tapa de válvula permanece unida de manera fija al cilindro de gas. En realizaciones preferidas de estas tapas convencionales, las aberturas son formadas de tal manera que un usuario está habilitado, además, para leer un manómetro y/o para conectar un conducto de gas a una salida separada de gas de baja presión.

Cabe señalar que si una estructura de válvula de un cilindro de gas fuera desprendida mientras el gas todavía está presente a alta presión en el cilindro, el gas en el cilindro tendería, al escapar, a dar propulsión de cohete al cilindro de gas. Como esta condición es muy peligrosa y necesita ser evitada por todos los medios, las tapas de válvula de los cilindros de gas mencionadas anteriormente están acopladas de manera fija a los cilindros de gas o estructuras de válvula y están dimensionadas para proporcionar la resistencia mecánica adecuada contra la ocurrencia de daños a la estructura de válvula.

Además, las tapas de válvula convencionales pueden servir como un asa para transportar cómodamente el cilindro de gas. Con el fin de servir como asa, la tapa de válvula puede comprender una porción específica de asa, como - por ejemplo - un recorte en la pared de la tapa de válvula que permite a un usuario llevar fácilmente el cilindro de gas portátil. En una realización adicional de las tapas de válvula convencionales, se suministra, además, un gancho que está destinado a suspender el cilindro de gas de una estructura respectiva.

Tal tapa de válvula estándar para un cilindro de gas portátil, en particular un cilindro de gas que contiene oxígeno, se describe, por ejemplo, en US 5,429,152. La tapa de válvula debe permanecer en el cilindro de gas y no puede ser retirada del cilindro de gas.

Sin embargo, las tapas de válvula que se utilizan convencionalmente para salvaguardar y proteger la estructura de válvula tienen necesariamente ciertas aberturas que se utilizan para acceder a las respectivas salidas de gas, volantes para operar la estructura de válvula, así como manómetros de observación de la estructura de válvula. En consecuencia, la estructura de válvula está siempre abierta de tal manera que el polvo y la suciedad pueden entrar fácilmente y poner en peligro la funcionalidad del cilindro de gas y/o pueden contaminar el producto gaseoso almacenado en el mismo cilindro de gas.

Con el fin de evitar la contaminación de la estructura de válvula, una práctica común para cubrir la estructura de válvula del cilindro de gas ha sido mediante la colocación de una bolsa de plástico, una bolsa retráctil o una película retráctil alrededor de ella, con el fin de evitar que el polvo y la humedad

entren en la estructura de válvula. Sin embargo, la colocación de las películas alrededor de la estructura de válvula es engorrosa y no puede automatizarse fácilmente. Además, es difícil para el usuario final eliminar las películas antes del uso, de tal manera que esta solución no se revela cómoda para el usuario final.

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Además, debido a la estructura abierta de la tapa de válvula, no se puede controlar si el cilindro de gas ha sido manipulado antes de que se utilice realmente por primera vez para administrar el gas a un paciente. En consecuencia, se intenta sellar la estructura de válvula por medio de la bolsa de plástico, bolsa retráctil o película retráctil mencionadas anteriormente.

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Un tal arreglo a prueba de manipulaciones es también pertinente para todos los otros gases como gases industriales, con el fin de asegurarse de que el cliente recibe el gas del modo en el que el cilindro de gas fue originalmente llenado por el proveedor.

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Resumen

En consecuencia, un objetivo de la presente invención es mejorar la fiabilidad de la estructura de válvula en un cilindro de gas que tiene una tapa de válvula.

20 El objetivo mencionado anteriormente se resuelve por medio de una cobertura para una tapa de válvula de un cilindro de gas con las características de la reivindicación 1. Realizaciones ventajosas de la invención son mencionadas en las reivindicaciones dependientes.

En consecuencia, la cobertura para una tapa de válvula de un cilindro de gas incluye una cavidad que
25 está dimensionada para recibir al menos partes de la tapa de válvula del cilindro de gas. De acuerdo con invención, la cobertura está hecha de un material sustancialmente rígido.

En la cavidad, pueden ser recibidas porciones de la tapa de válvula. Sin embargo, dependiendo de la geometría de la tapa de válvula también se contempla que toda la tapa de válvula sea recibida en la
30 cavidad.

Por medio de la provisión de una cobertura hecha de un material sustancialmente rígido que cubre al menos porciones de la tapa de válvula del cilindro de gas, se vuelve posible mejorar la fiabilidad de la estructura de válvula debido a que se impide que la tapa de válvula del cilindro de gas se contamine y
35 manipule, ya que está rodeada por la cobertura.

La provisión de la estructura rígida afecta en gran medida la aplicabilidad de la cobertura a la tapa de válvula de modo tal que esto se puede hacer de una manera automatizada - o al menos con una reducción significativa de labor manual. La cobertura puede ser colocada alrededor de la tapa de
40 válvula y cubrir no sólo la tapa de la válvula, pero - al cubrir de forma segura las aberturas en la tapa de válvula - cubre también la estructura de válvula. Debido a que el material de la tapa de válvula es

sustancialmente rígido, la cobertura proporciona una estructura robusta, incluso al extenderse sobre las aberturas que se proporcionan en la tapa de válvula. Además, debido a que está hecha de un material rígido, no va a ser posible que una tercera parte manipule el cilindro de gas sin que este intento sea notado. La estructura rígida no puede ser fácilmente retirada con el fin de acceder al volante y/o a las salidas de gas, no así en el caso de una bolsa de plástico flexible, bolsa retráctil o film retráctil. Además, la cobertura rígida prohíbe a terceros el acceder a las aberturas de la tapa de válvula y, por lo tanto, el alcanzar con sus manos y/o herramientas dentro de la tapa de válvula para alterar la estructura de válvula.

En este contexto, cabe señalar que la tapa de válvula que cubre la unidad de válvula del cilindro de gas se conoce a menudo también como un "guardia", una "tapa" o un "Valve Protection Carry Handle" (VPCH).

La cobertura está hecha preferentemente de un material termoformable, preferentemente un material plástico termoformable, y está hecho preferentemente a partir de PET (poli-etilen tereftalato), de PVC (poli-cloruro de vinilo), PCTFE (poli-clorotrifluoro etileno) laminado a PVC, COC (copolímeros de olefinas cíclicas), COP (polímeros de olefinas cíclicas), preferentemente en combinaciones multicapas con PP (polipropileno), PE (polietileno), o PETg (poli-etilen tereftalato modificado con glicol).

Mediante la provisión de este material, se puede lograr una producción rentable de la cobertura. Con este tipo de material también es posible fabricar la cobertura de modo tal que se asemeje estrechamente a las proporciones exteriores de la tapa de válvula del cilindro de gas. El proceso de fabricación de moldeo y el recorte de una hoja de plástico termoformable de modo de hacer un producto final es bien conocido, de tal manera que la cobertura puede ser fabricada de manera fácil, fiable y económica. De hecho, el proceso de termoformado es incluso más económico que un proceso de inyección. Sin embargo, la cobertura también podría ser fabricada usando un proceso de moldeo por inyección de tal manera que la cobertura sea moldeada por inyección.

Preferentemente, la cobertura es provista en la forma de un envase blister y/o una envase de plástico de tipo clamshell. Estas formas de paquetes permiten una producción eficiente de la cobertura garantizando al mismo tiempo que la integridad de la estructura de válvula dentro de la tapa de válvula se mantenga mientras la tapa de válvula es recibida en la cobertura.

En una realización preferida de la presente invención, la cobertura comprende dos semi-carcasas que forman la cavidad para recibir porciones de la tapa de válvula al ser plegadas sobre sí mismas. Al mismo tiempo, la provisión de dos semi-carcasas permite que la cobertura ya sea formada para asemejarse estrechamente a los contornos exteriores de la tapa de válvula, porque se pueden formar rebajes más fácilmente.

Con el fin de mejorar aún más las características a prueba de manipulaciones de la cobertura, las dos semi-carcasas son preferentemente interconectables por medio de al menos un conector a prueba de manipulaciones para formar una cobertura a prueba de manipulaciones. El conector a prueba de

manipulaciones se hace preferentemente de tal manera que sólo puede ser conectado una vez, de modo que se destruye tan pronto como se intente abrir nuevamente la conexión una vez cerrada. Por medio de este conector a prueba de manipulaciones, se asegura que un usuario puede determinar fácilmente si el cilindro de gas está en el estado deseado, es decir, en el estado en el que ha dejado las instalaciones del proveedor respectivo, o si el cilindro de gas ha sido manipulado. Esto es de importancia para todos los diferentes rellenos de un cilindro de gas tales como gases medicinales, gases industriales, así como cualesquiera otros gases.

Preferentemente, las dos semi-carcasas están conectadas a través de una bisagra de lámina. La provisión de una bisagra de lámina permite aplicación aún más fácil de la cobertura a la tapa de válvula, ya que puede ser fácilmente plegada alrededor de la tapa de válvula.

Preferentemente, las dos semi-carcasas se pueden interconectar por medio de un conector a prueba de manipulaciones, tal como un clip, una soldadura térmica, un agrafe, una abrazadera, una grapa, un collar de plástico y/o una banda adhesiva, de manera que la cobertura pueda ser aplicada efectivamente alrededor de la tapa de válvula del cilindro de gas, pero no pueda ser eliminada sin ser destruida. Cuando una cobertura tal es aplicada a la tapa de válvula una vez que el cilindro de gas se ha llenado en un sitio de llenado de un distribuidor de proveedor de gas o de gas, el usuario final, por ejemplo, el empleado en el hospital, el usuario final en una aplicación de cuidados en el hogar o el usuario final en una aplicación industrial, puede determinar fácilmente si el cilindro de gas se encuentra en su estado originalmente lleno o si ha sido manipulado. Cuando la cobertura está completamente intacta y en su lugar, el usuario final puede estar seguro de que el cilindro de gas y sus contenidos no han sido manipulados. Además, el usuario final también puede estar seguro de que la cantidad de llenado de la cilindro de gas no ha cambiado, debido a que no era posible liberar gas desde el cilindro de gas sin tener acceso a la estructura de válvula.

En una alternativa, la cobertura comprende más de dos partes que forman la cavidad cuando están conectadas. Por medio de proporcionar no sólo dos semi-carcasas, sino más de dos partes de la cobertura para la formación de la cavidad para recibir al menos porciones de la tapa de válvula, la cobertura puede adaptarse más fácilmente a geometrías específicas de la tapa de válvula. En particular, la línea de división entre las partes respectivas de la cobertura puede ser definida de tal manera que la cobertura pueda ser aplicada fácilmente alrededor de la tapa de válvula.

Preferentemente, las al menos dos partes son interconectables por medio de al menos un conector a prueba de manipulaciones para formar una cobertura a prueba de manipulaciones y/o en donde al menos dos partes están conectadas a través de una bisagra de lámina y/o una lengüeta.

En una realización preferida adicional, se forma la cavidad de tal manera que rodea completamente la tapa de válvula del cilindro de gas cuando se aplica a la tapa de válvula. Al encerrar completamente la tapa de válvula del cilindro de gas, el estándar de seguridad se eleva aún más. Además, cubriendo completamente la tapa de válvula del cilindro de gas, se puede evitar la contaminación de la estructura de válvula situada dentro de la tapa de válvula del cilindro de gas.

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La cobertura puede ser hecha en una pieza, preferentemente mediante termoformado de una hoja de plástico termoformable, con el fin de aumentar su fiabilidad y con el fin de reducir el costo de fabricación. Por supuesto, la cobertura de una pieza también podría hacerse mediante moldeo por inyección.

Para estar en una posición para llevar fácilmente el cilindro de gas, se prefiere que una porción de asa se forme en la cavidad, en donde esta porción de asa de la cobertura se asemeja a una porción de asa de la tapa de válvula. En consecuencia, un usuario puede llevar el cilindro de gas por la porción de asa dispuesta en la tapa de válvula al agarrar la porción de asa de la cobertura. Sin embargo, al mismo tiempo, el contenido de la tapa de válvula se encuentra todavía protegido, dado que la cobertura está presente como capa exterior. En otras palabras, el usuario puede determinar si la cobertura está todavía intacta o si los contenidos del cilindro de gas han sido manipulados.

Con el fin de hacer más seguro que la cobertura se encuentre firmemente instalada en el cilindro de gas, se forma en la cobertura preferentemente un collar que está destinado a ser dispuesto en una porción inferior de la tapa de válvula. En una realización aún más preferida, el collar define una abertura que tiene un diámetro que es más pequeño que el diámetro más grande de la tapa de válvula. Debido a la provisión de este collar, se volverá imposible quitar la cobertura de la tapa de válvula con sólo tirar hacia afuera desde el cilindro de gas sin romper, al menos, el collar de la cobertura. Preferentemente, el collar debe rodear la unidad de válvula entre la tapa de válvula y el cilindro de gas de tal manera que la cobertura, en su estado cerrado y aplicado, no se pueda quitar de la tapa de válvula sin ser destruida.

En aún otra realización preferida, se forma la cobertura para encerrar herméticamente la tapa de válvula del cilindro de gas cuando es aplicada a la tapa de válvula. Por medio de este recinto hermético se asegura de que ningún tercero pueda acceder a cualesquiera porciones relevantes de la estructura de válvula sin retirar y - por lo tanto - destruir la cobertura.

La cavidad definida por la cobertura es preferentemente adecuada para recibir la tapa de válvula del cilindro de gas en su totalidad y los contornos de la parte interior de la cavidad interna se asemejan preferentemente a los contornos exteriores de la tapa de válvula del cilindro de gas de tal manera que la cobertura se asienta estrechamente y firmemente en la tapa de válvula del cilindro de gas. Esto tiene la ventaja de poder evitar de forma segura la contaminación de la tapa de válvula del cilindro de gas, así como la unidad de válvula situada dentro de la tapa de válvula, y evitar que la cobertura rígida sea destruido una vez que el cilindro de gas sea sacudido porque el espesor de pared de la cobertura ya no es de relevancia, sino más bien es completamente soportado por la pared de la tapa de válvula como tal.

Preferentemente, la cobertura cubre todas las aberturas de la tapa de válvula del cilindro de gas de tal manera que se pueden evitar con seguridad la contaminación y la operación inadvertida y la

manipulación de la unidad de válvula situada dentro de la tapa de válvula, pero generalmente accesible a través de las aberturas en la tapa de válvula.

5 En otra realización preferida, la cobertura comprende una cavidad que se asemeja o se ajusta a los contornos de un asa en la tapa de válvula del cilindro de gas. Por medio de la provisión de una tal cavidad se hace posible llevar el cilindro de gas en una mano, aún cuando la cobertura sigue en su lugar.

10 Preferentemente, la cobertura incluye aberturas y/o recortes para recibir un gancho o cualquier otro medio de fijación situado en la tapa de válvula del cilindro de gas.

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Breve Descripción de las Figuras

En lo que sigue, la presente descripción se ejemplifica adicionalmente por medio de las Figuras de los dibujos en donde:

Figura 1 es una vista en perspectiva esquemática de una cobertura de ejemplo colocada en una tapa de válvula de un cilindro de gas;

Figura 2 es una vista en perspectiva esquemática de la cobertura para una tapa de válvula de un cilindro de gas en un estado abierto, que muestra la cavidad interior de la cobertura;

Figura 3 es una vista en perspectiva esquemática de la cobertura en una condición cerrada;

Figura 4 es una vista lateral esquemática de la cobertura colocada sobre una tapa de válvula de un cilindro de gas; y

Figura 5 es una vista en perspectiva esquemática de la cobertura abierta de la Figura 2 tomada desde una perspectiva diferente.

Descripción Detallada de las Realizaciones preferidas

En la siguiente discusión de las realizaciones preferidas, elementos similares son identificados con números de referencia idénticos, y la descripción repetida de los respectivos elementos puede ser omitida con el fin de evitar redundancias en la memoria.

La Figura 1 muestra, en una vista en perspectiva esquemática, un conjunto de un cilindro 1 de gas con una tapa de válvula 2 en donde la tapa de válvula 2 debe encerrar una estructura de válvula o unidad de válvula asociada al cilindro 1 de gas. En la Figura 1, esta estructura de válvula no se muestra explícitamente, pero que se supone que se encuentra en el interior de la tapa de válvula 2. La tapa de válvula 2 está unida de manera fija al cilindro 1 de gas, por ejemplo, mediante un conjunto de tornillos 26 de la tapa de válvula 2. En la realización mostrada en la Figura 1, la tapa de válvula 2 comprende al menos dos semi-carcasas que están conectadas por medio de los tornillos 26 de modo tal que se consigue una acción de agarre y/o ajuste de forma entre la tapa de válvula 2 y el cilindro 1 de gas de tal manera que la tapa de válvula 2 está unida de manera fija al cilindro 1 de gas.

Se provee una cobertura 3 para cubrir la tapa de válvula 2 del cilindro 1 de gas, donde la cobertura 3 incluye un material rígido y forma una cavidad para recibir a la tapa de válvula 2 del cilindro 1 de gas.

En las realizaciones mostradas en las Figuras, la cobertura 3 comprende al menos dos semi-carcasas

30, 32, donde las dos semi-carcasas 30, 32 forman la cavidad cuando están conectadas la una a la otra de tal manera que la tapa de válvula 2 puede ser recibida completamente en la cavidad.

El cilindro 1 de gas es preferentemente un cilindro de gas portátil que se usa típicamente en aplicaciones de cuidado en el hogar y aplicaciones de emergencia en hospitales o para el suministro de gas cuando un paciente es transportado dentro de un hospital. Con el fin de calificar como portátil, el volumen del cilindro 1 de gas está preferentemente en un intervalo de entre 1 y 15 litros de tal manera que el peso del cilindro 1 de gas puede aún ser manejado por el personal médico, preferentemente con una sola mano.

La tapa de válvula 2 está unida de manera fija al cilindro 1 de gas y debe salvaguardar y proteger una unidad de válvula del cilindro 1 de gas. La unidad de válvula es recibida totalmente en el interior del volumen definido por la tapa de válvula 2 y sirve para la salida de gas desde el cilindro 1 de gas para los respectivos usuarios. La unidad de válvula, por lo tanto, incluye al menos una salida de gas y típicamente al menos un volante para abrir y cerrar la válvula. En realizaciones preferidas, la unidad de válvula incluye además una salida de baja presión donde la baja presión es conseguida por medio de un regulador de presión interna. En otras realizaciones preferidas, se provee un manómetro con el fin de controlar la presión del gas recibido en el cilindro 1 de gas.

Con el fin de acceder a los respectivos salidas de gas, volantes y manómetros, están presentes aberturas 20 en la tapa de válvula 2. A través de estas aberturas 20 los diferentes elementos de la unidad de válvula pueden ser accedidos por un usuario con el fin de operar el cilindro 1 de gas.

Un gancho 22 también está presente y está unido directamente a la tapa de válvula 2, en donde el gancho 22 está destinado a colgar el cilindro 1 de gas a una estructura durante el uso.

La tapa de válvula 2 comprende, además, una porción de asa 24 que permite a un usuario llevar convenientemente el cilindro 1 de gas, simplemente agarrando la porción de asa 24 con una mano.

La cobertura 3 cubre preferentemente toda la tapa de válvula 2 de tal manera que rodea completamente la tapa de válvula 2. Preferentemente, todas las aberturas 20 de la tapa de válvula 2 están totalmente cubiertas por la cobertura 3 con el fin de asegurarse de que la unidad de válvula está protegida de ser contaminada durante el transporte. Además, una tal cobertura completa proporciona una disposición a prueba de manipulaciones que asegura que el cilindro 1 de gas está completamente lleno al llegar al respectivo cliente y asegura que nadie ha manipulado el contenido del cilindro 1 de gas.

Preferentemente, la cobertura 3 incluye al menos una abertura o cavidad 34 en la posición donde se encuentra el asa 24 de la tapa de válvula 2. En particular, la cobertura 3 preferentemente se asemeja estrechamente a los contornos exteriores de la tapa de válvula 2 en particular en el asa 24 de tal manera que el cilindro 1 de gas puede ser llevado fácilmente al agarrar el asa 24, incluso si la cobertura 3 está en su lugar.

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La cobertura 3, además, incluye un corte 36 en una posición en la que se proporciona el gancho 22 de la tapa de válvula 2 de tal manera que el gancho 22 puede aún ser utilizado.

5 Como se puede ver en la Figura 1, la cobertura 3 se asemeja estrechamente a los contornos exteriores de la tapa de válvula 2. La estrecha semejanza de la cobertura 3 a la tapa de válvula 2 tiene, entre otras, la ventaja de que la cobertura 3 no puede ser quitada fácilmente y que la cobertura 3 recibe integridad estructural a partir del material de tapa de válvula de apoyo directo.

10 Las Figuras 2 y 5 muestran la cobertura 3 en su estado abierto. La cobertura 3 comprende una primera semi-carcasa 30 y una segunda semi-carcasa 32, que están conectadas la una respecto de la otra por medio de una bisagra de lámina 300 y/o al menos una lengüeta.

15 Preferentemente, la primera semi-carcasa 30, la segunda semi-carcasa 32, así como la bisagra de lámina están fabricadas por embutición profunda de un material adecuado o por fundición integral del material respectivo. En otras palabras, las dos semi-carcasas y su conexión se realizan preferentemente en una sola pieza a partir de una hoja de un material plástico adecuado tal como una lámina de PET (poli-etilen tereftalato) o PVC (poli-cloruro de vinilo). Otros materiales adecuados incluyen PCTFE (poli-clorotrifluoro etileno) laminado a PVC, o COC (copolímeros de olefinas cíclicas),
20 o COP (polímeros de olefinas cíclicas), que se proporcionan con el fin de mejorar la barrera a la humedad, preferentemente en combinaciones multicapas con PP (polipropileno), PE (polietileno), o PETg (poli-etilen tereftalato modificado con glicol).

En una alternativa, se podría utilizar también un proceso de moldeo por inyección para fabricar la
25 cobertura 3.

La bisagra de lámina 300 se utiliza para pivotar las dos semi-carcasas 30, 32 la una con respecto a la otra con el fin de cerrar la cobertura 3 en la forma como se muestra en la Figura 3 y para formar la cavidad que está dimensionada para recibir la tapa de válvula 2 del cilindro 1 de gas. En un desarrollo
30 alternativo o adicional que no se muestra en las Figuras, las dos semi-carcasas 30, 32 están conectadas por medio de lengüetas.

En una alternativa que no se muestra en las Figuras, la cobertura 3 comprende más de dos partes que forman la cavidad cuando están conectadas. Preferentemente, los al menos dos partes son
35 interconectables por medio de al menos un conector a prueba de manipulaciones para formar una cobertura a prueba de manipulaciones y/o en donde al menos dos partes están conectadas por medio de una bisagra de lámina y/o una lengüeta.

Con el fin de cerrar la cobertura 3 mostrada en las Figuras y mantenerla en la condición cerrada, se
40 proveen medios de sujeción 310. Los medios de sujeción 310 comprenden un perno 312, así como una correspondiente abertura de recepción 314. El perno 312 está dimensionado para ser recibido en

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la abertura de recepción 314 de modo tal que se forma una conexión fija tras la inserción del perno 312 en la abertura 314.

En un desarrollo alternativo o adicional, la conexión también se puede proporcionar en forma de un clip, una soldadura térmica, un agrafo, una abrazadera, una grapa, un collar de plástico y/o una banda adhesiva.

En la realización preferida mostrada en las Figuras, la conexión no puede ser vuelta a abrir sin destruir el material de la cobertura 3. En este sentido, el material en forma de domo que rodea las aberturas 314 interactúa con una cuenta 316 de los pernos 312 de manera que cuando los pernos 312 se insertan a través de las aberturas 314, el material en forma de domo está elásticamente extendido y retraído después de que la cuenta 316 haya pasado el material. Por consiguiente, el material en forma de domo que rodea la abertura 314 descansa detrás de la cuenta 316. Cuando se intenta abrir de nuevo la cobertura 3, se destruyen las porciones en forma de domo que rodean la abertura 314. En otras palabras, la conexión se forma como una conexión frangible de modo tal que resulte en un conjunto a prueba de manipulaciones.

La disposición a prueba de manipulaciones es particularmente adecuada para cilindros de gas que se utilizan para distribuir gases medicinales o gases industriales, ya que permite al usuario final determinar si el cilindro de gas ha sido manipulado de modo tal que el usuario final puede asegurarse de que el cilindro de gas contiene el gas esperado.

Con el fin de ser recibida en una porción de asa de la tapa de válvula de un cilindro de gas, está presente una cavidad 32 en la cobertura 3. Cuando se considera la Figura, se hace evidente de inmediato que esta cavidad 32 también sirve para llevar el cilindro de gas con una sola mano.

La interconexión de los pernos 312 con el material en forma de domo que rodea a las aberturas 314 conduce a un sellado a prueba de manipulaciones de la cobertura una vez que se ha establecido en su lugar adjunto a la tapa de válvula 2. De hecho, como se puede ver en la figura 3, la cobertura 3 sólo puede ser eliminada mediante la destrucción de o bien la conexión entre los pernos 312 y el material en forma de domo alrededor de las aberturas 314, mediante la destrucción de la bisagra de lámina 300, o mediante la destrucción de cualquier otra porción del material de la cobertura 3. Es decir, la cobertura 3 no puede ser quitada sin ser destruida.

De acuerdo con ello, la cobertura 3 sirve como un miembro a prueba de manipulaciones en el sentido en que un usuario puede saber a partir de la condición de la cobertura 3 si el cilindro de gas ha sido manipulado o si está en su estado previsto.

Las dos semi-carcasas 30, 32 incluyen, en su parte inferior, un collar 320, en donde este collar 320 debe ser insertado debajo de la parte inferior de la tapa de válvula 2 del cilindro 1 de gas cuando la

cobertura 3 está en su estado cerrado previsto. La posición del collar 320 de la cobertura 3 en el estado cerrado de la cobertura 3 se muestra esquemáticamente en la Figura 1.

Las porciones de collar 320 se combinan para un collar completo una vez que las dos semi-carcasas 30, 32 son plegadas la una sobre la otra. Esto se puede ver claramente en la Figura 3, en donde la porción inferior de la cobertura 3 incluyendo el collar 320 está situada en la parte superior de la Figura. De hecho, la abertura 322 que se mantiene en el diámetro interior del collar 320 debe recibir a la unidad de válvula, pero debe tener un diámetro menor que el diámetro inferior de la tapa de válvula 2 del cilindro 1 de gas.

La porción superior de la cobertura 3 debe cerrar la cavidad que se forma cuando las dos semi-carcasas 30, 32 son plegadas la una sobre otra. Para este fin, una porción superior 330 de la cobertura 3 está provista en la segunda semi-carcasa 32, que debe cooperar con un saliente 332 en la primera semi-carcasa 30 con el fin de cerrar la cobertura 3 cuando las dos semi-carcasas 30, 32 son plegadas la una sobre otra. El saliente 332 debe ser deslizado por debajo de la porción superior 330 de la cobertura 3 una vez que las primera y segunda semi-carcasas son plegadas la una sobre la otra.

Las cavidades internas 340 y 342 de las respectivas semi-carcasas 30 y 32 están conformadas preferentemente de tal manera que se asemejan estrechamente a los contornos exteriores de la tapa de válvula 2 del cilindro 1 de gas. Por esta medida, se puede lograr no sólo una forma eficaz de transportar el cilindro 1 de gas, sino que se puede lograr también un mayor grado de resistencia de la cobertura.

Reivindicaciones

1. Cobertura (3) para una tapa de válvula (2) de un cilindro (1) de gas, en donde la cobertura (3) incluye una cavidad (340, 342) que está dimensionada para recibir a al menos una porción de la tapa de válvula (2) del cilindro (1) de gas,

caracterizada en que

la cobertura (3) está hecha de un material sustancialmente rígido.

2. Cobertura (3) de acuerdo con la reivindicación 1, en donde la cobertura (3) está hecha de un material termoformable, preferentemente un material plástico termoformable, preferentemente hecha de PET (poli-etilen tereftalato), de PVC (poli-cloruro de vinilo), PCTFE (poli-clorotrifluoro etileno) laminado a PVC, COC (copolímeros de olefinas cíclicas), COP (polímeros de olefinas cíclicas), preferentemente en combinaciones multicapas con PP (polipropileno), PE (polietileno), o PETg (poli-etilen tereftalato modificado con glicol) o la cobertura (3) está moldeada por inyección.

3. Cobertura (3) de acuerdo con la reivindicación 1 o 2, en donde la cobertura (3) es provista en forma de un envase blister y/o un envase tipo clamshell.

4. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde la cobertura incluye un mecanismo de conexión a prueba de manipulaciones (310, 312, 314, 316), preferentemente en forma de una disposición de conexión frangible, más preferentemente en la forma de un clip, una soldadura térmica, un agrafe, una abrazadera, una grapa, un collar de plástico y/o una banda adhesiva.

5. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, que comprende dos semi-carcasas (30, 32) que forman la cavidad (340, 342) para recibir porciones de la tapa de válvula (2) cuando están plegadas sobre sí mismas.

6. Cobertura (3) de acuerdo con la reivindicación 5, en donde las dos semi-carcasas (30, 32) son interconectables por medio de al menos un conector (310, 312, 314, 316) a prueba de manipulaciones para formar una cobertura a prueba de manipulaciones.

7. Cobertura (3) de acuerdo con la reivindicación 5 o 6, en donde las dos semi-carcasas (30, 32) están conectadas a través de una bisagra de lámina (300) y/o una lengüeta.

8. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones 1 a 4, que comprende más de dos partes que forman la cavidad cuando están conectadas.

9. Cobertura (3) de acuerdo con la reivindicación 8, en donde al menos dos partes son interconectables por medio de al menos un conector a prueba de manipulaciones, preferentemente en la forma de un clip, una soldadura térmica, un agrafe, una abrazadera, una grapa, un collar de plástico y/o una banda adhesiva, para formar una cobertura a prueba de manipulaciones y/o en donde al menos dos partes están conectadas a través de una bisagra de lámina (300) y/o una lengüeta.
10. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde la cavidad está formada de tal manera que rodea completamente la tapa de válvula (2) del cilindro (1) de gas cuando es aplicada a la tapa de válvula (2).
11. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde la cobertura (3) está hecha en una sola pieza, preferentemente por termoformado de una hoja de plástico termoformable o mediante moldeo por inyección.
12. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde una porción de asa (32) de la cavidad, que se asemeja a una porción de asa (24) de la tapa de válvula (2) está formada en la cobertura (3).
13. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde un collar (320) está formado en la cobertura (3) el cual está destinado a estar dispuesto en una porción inferior de la tapa de válvula (2).
14. Cobertura (3) según la reivindicación 13, en donde el collar (320) define una abertura (322) que tiene un diámetro menor que el diámetro más grande de la tapa de válvula (2).
15. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde la cobertura está formada para sellar herméticamente la tapa de válvula (2) del cilindro (1) de gas cuando es aplicada a la tapa de válvula (2).
16. Cobertura (3) de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde se proveen aberturas para recibir un gancho o cualquier otro medio de fijación situado en la tapa de válvula del cilindro de gas.

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Resumen

La presente invención está dirigida a una cobertura (3) para una tapa de válvula (2) de un cilindro (1) de gas, en donde la cobertura (3) incluye una cavidad (340, 342) que está dimensionada para recibir
5 porciones de la tapa de válvula (2) del cilindro (1) de gas, donde la cobertura (3) está hecha de un material sustancialmente rígido.

(Figura 1)

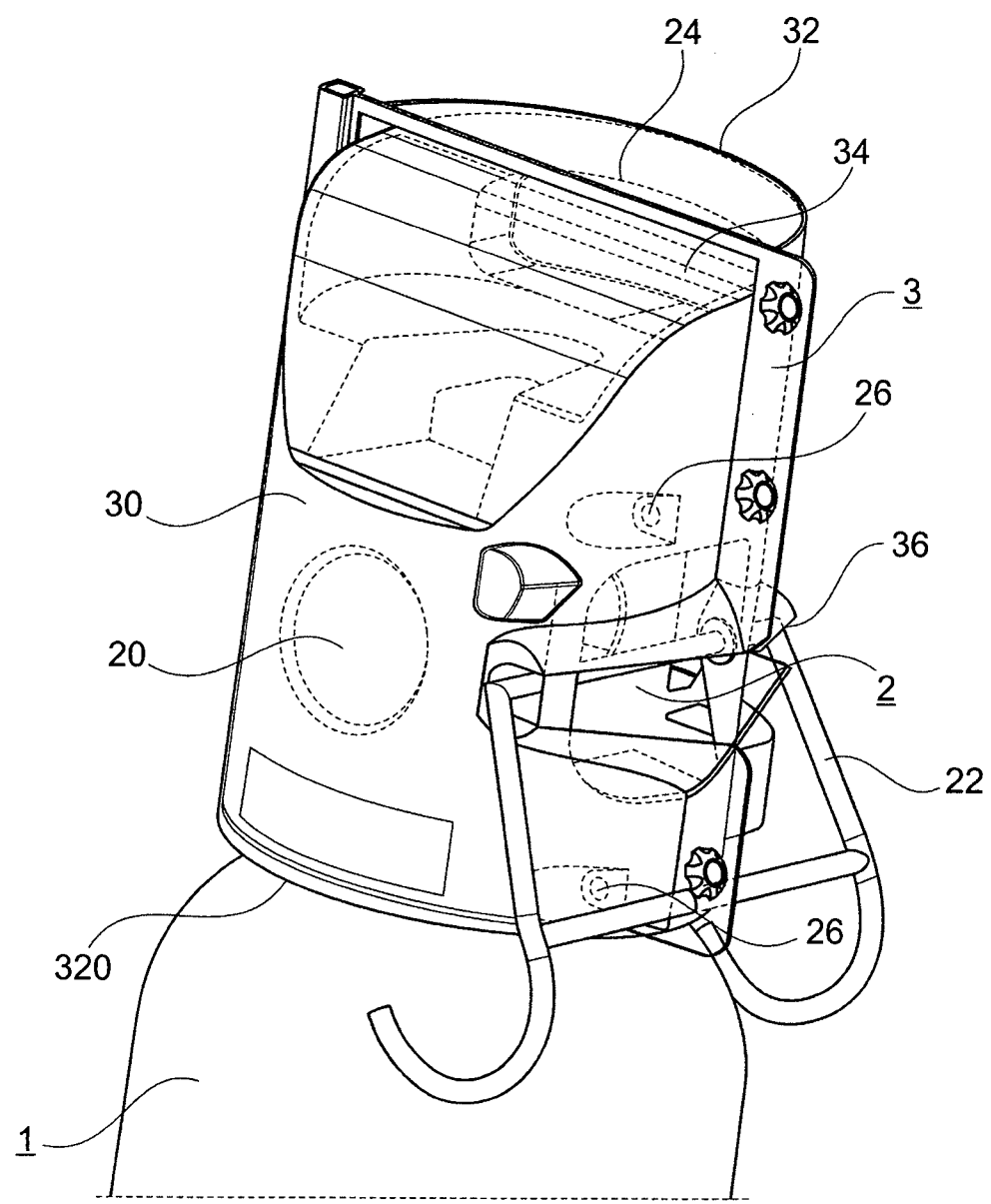


Fig. 1

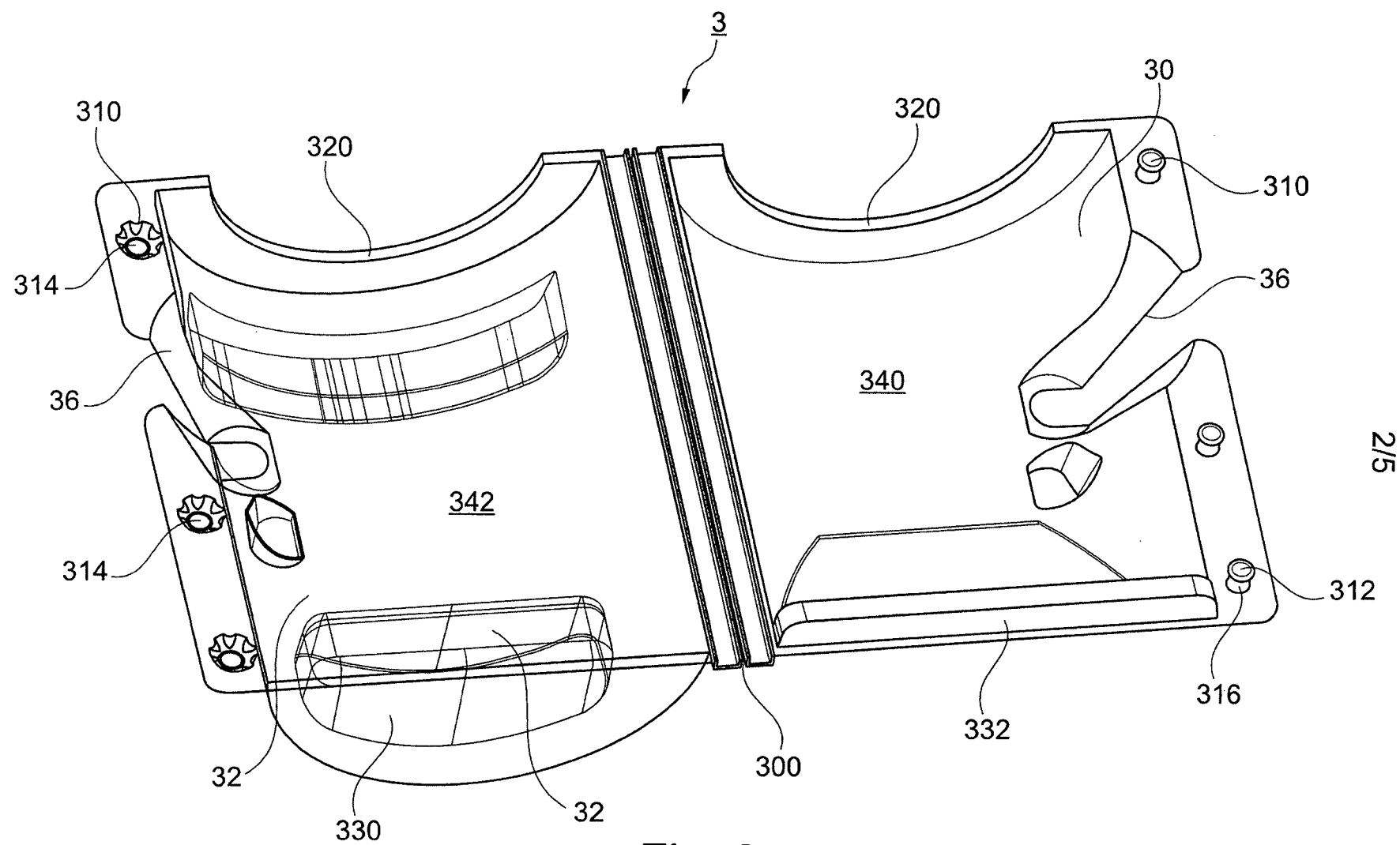


Fig. 2

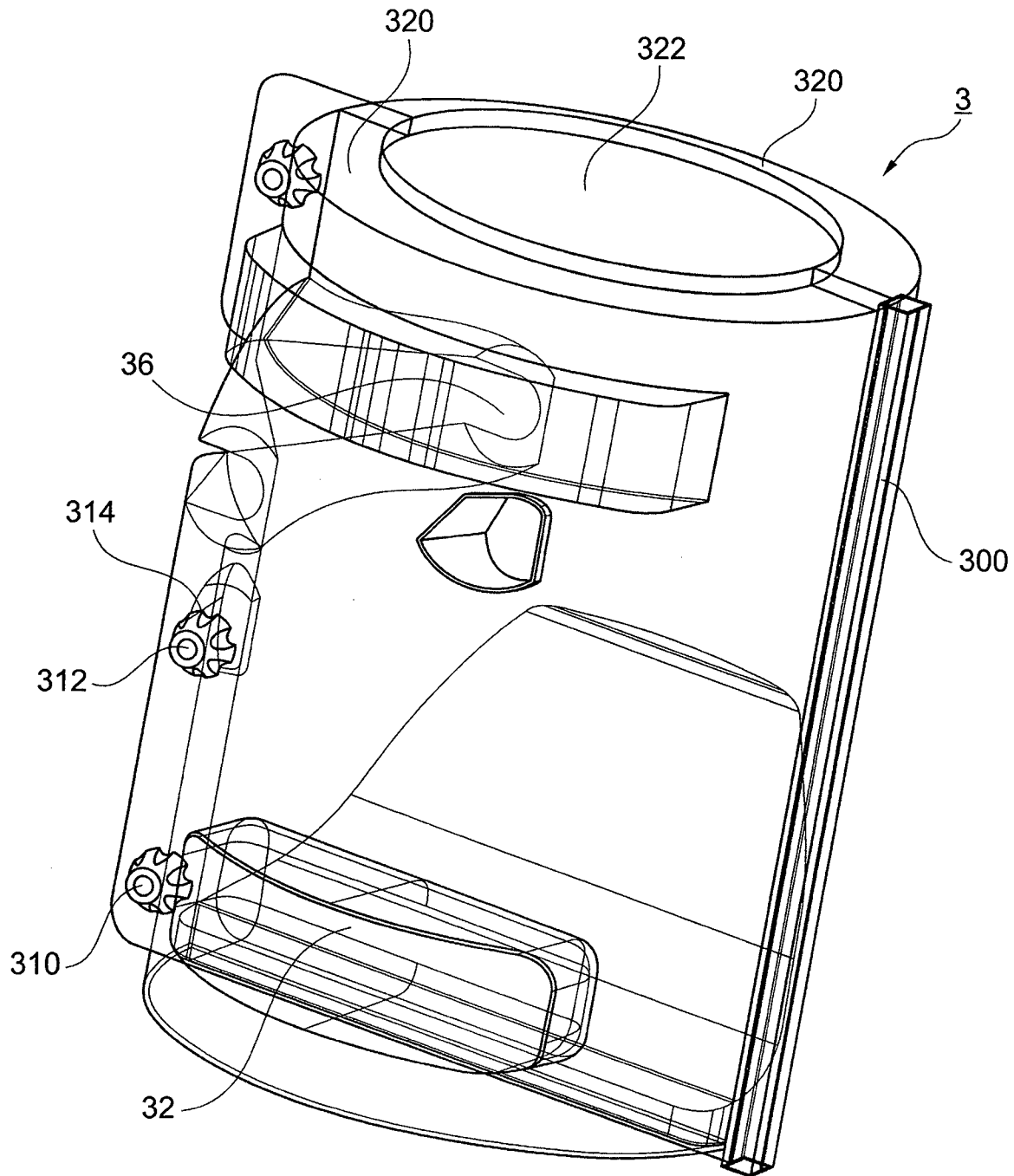


Fig. 3

4/5

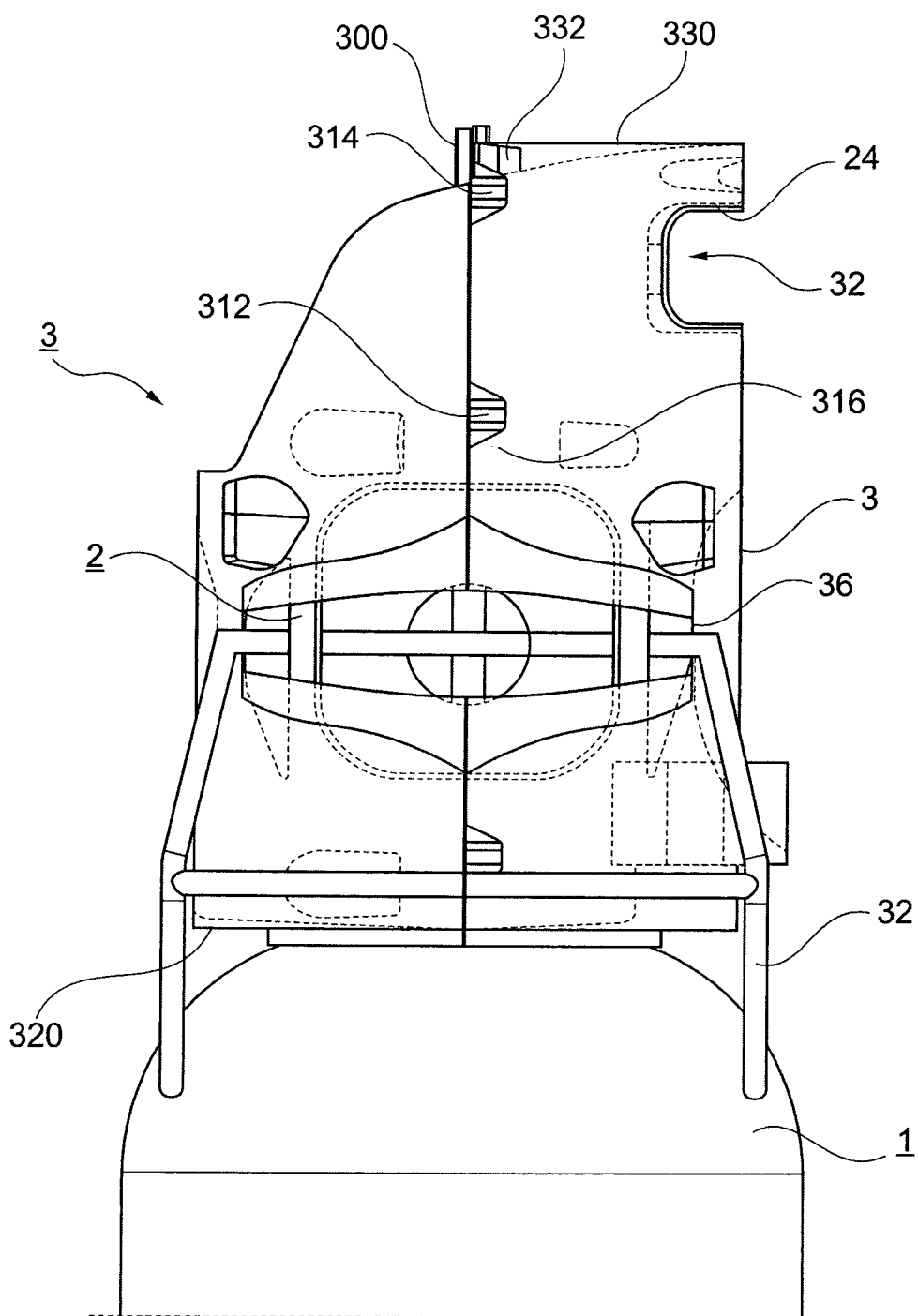


Fig. 4

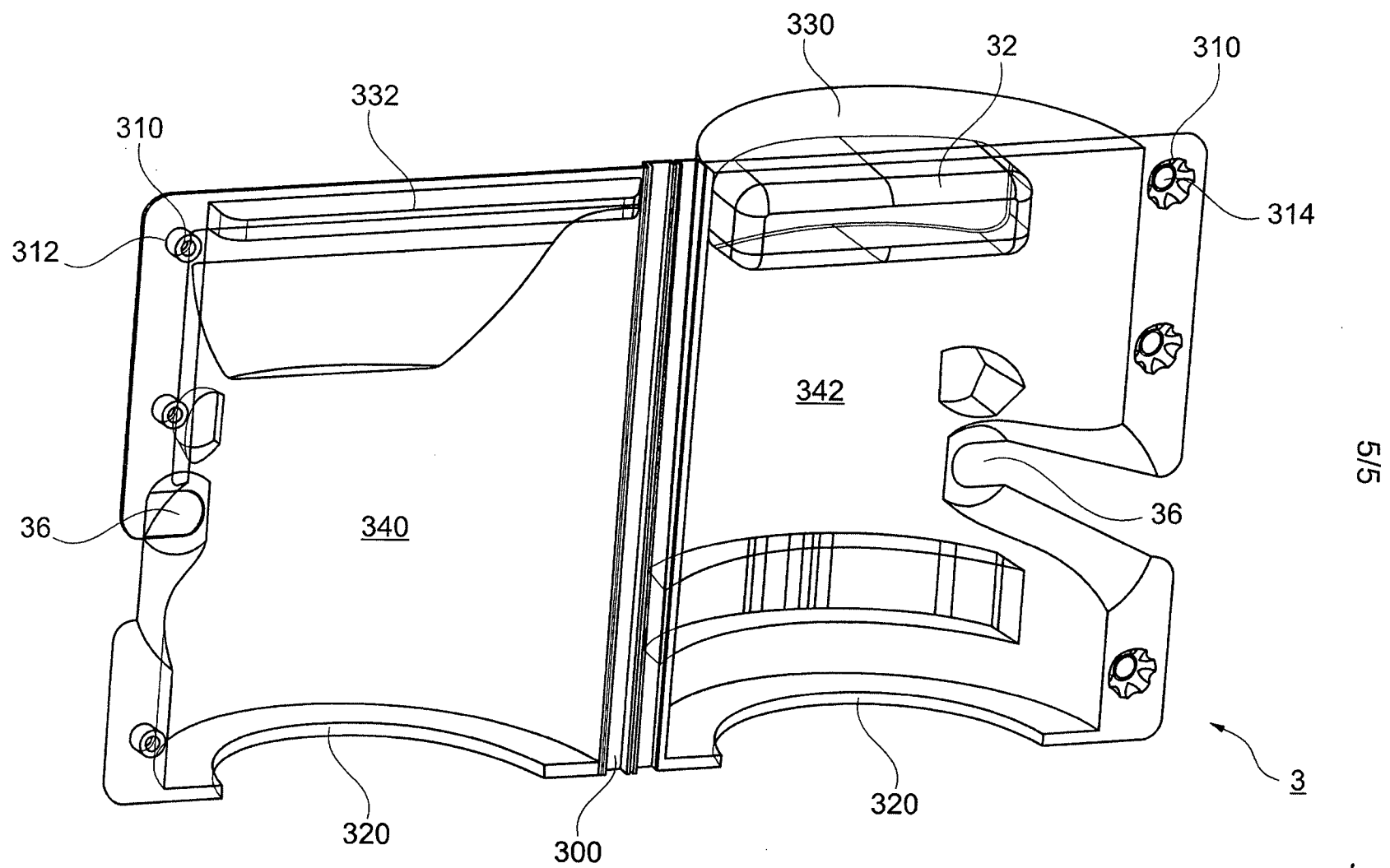


Fig. 5

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(54) Title: COVER FOR A VALVE CAP OF A GAS CYLINDER

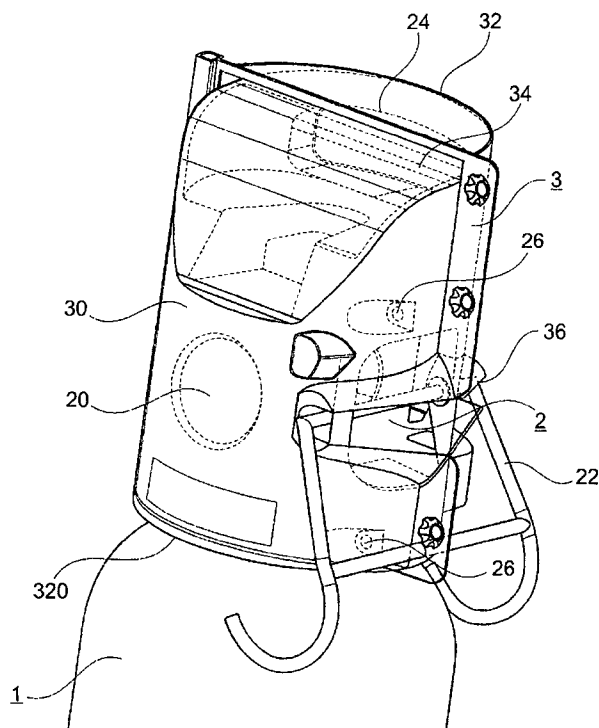


Fig. 1

(57) Abstract: The present invention pertains to a cover (3) for a valve cap (2) of a gas cylinder (1), wherein the cover (3) includes a cavity (340, 342) which is dimensioned to receive portions of the valve cap (2) of the gas cylinder (1), wherein the cover (3) is made from a substantially rigid material.

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Cover for a valve cap of a gas cylinder

Technical Field

- 10 The present invention pertains to a cover for a valve cap of a gas cylinder, preferably to a cover for a valve cap of a portable gas cylinder containing medical gases.

Technological Background

- 15 In the field of the distribution of medical gases it is known to distribute gases by means of gas cylinders. Specialty medical gases such as helium or nitrous oxide or standard medical gases such as oxygen and medical air are distributed to the respective hospitals or treatment centers in gas cylinders. In an alternative distribution channel, the gas cylinders are directly delivered to the home of a patient in order to be used in homecare applications. The gas cylinders are then either
20 connected to a piping system in the hospital or in an emergency vehicle, or are directly used at the administration site, for example directly at a patient's bed.

- In the latter case, the gas cylinders are preferably relatively small such that they are easily portable. The provision of portable gas cylinders obviates the need to provide gas outlets of a
25 hospital pipeline system at the patient's bed and/or offers the possibility to relocate the respective patient easily within the hospital without interrupting the gas supply because the gas cylinder can be moved together with the bed of the patient. Furthermore, portable gas cylinders can be easily suspended in the vicinity of the bed of the patient by means of a hook provided at the gas cylinder which can be connected to a structure of the patient's bed.

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The gas cylinders which are used in the medical field are typically fitted with a specific valve structure which is fixedly secured to the outlet portion of the gas cylinder such that the user can start administering the gas from the gas cylinder immediately without the need for mounting any valve components to the gas cylinder such as a pressure regulator. At the same time, the supplier

of the gas cylinder can be sure that the valve structure is tailored to the specific specifications of the respective gas. In order to improve the mechanical integrity and in order to safeguard the delicate valve structure, the gas cylinder usually carries a valve cap around the valve structure wherein this valve cap is typically fixedly attached to the gas cylinder and/or to the valve structure.

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Such a conventional valve cap of a gas cylinder usually has several openings through which the valve structure can be accessed such that a gas outlet and a hand wheel for opening and closing the valve are accessible whilst the valve cap remains fixedly attached to the gas cylinder. In preferred embodiments of these conventional caps, the openings are formed such that a user is additionally enabled to read a manometer and/or to connect a gas conduit to a separate low pressure gas outlet.

10

It should be noted that if a valve structure of a gas cylinder should ever be broken off whilst the gas is still present under high pressure in the cylinder, the gas in the cylinder would, upon escaping, tend to give the gas cylinder rocket propulsion. As this condition is very dangerous and needs to be avoided by any means, the above-mentioned valve caps of the gas cylinders are fixedly attached to the gas cylinders or valve structures and are dimensioned to provide adequate mechanical resistance against the occurrence of damages to the valve structure.

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In addition, conventional valve caps may serve as a handle for conveniently carrying the gas cylinder. In order to serve as a handle, the valve cap may comprise a specific handle portion such as – for example – a cutout in the wall of the valve cap which enables a user to easily carry the portable gas cylinder. In a further embodiment of the conventional valve caps, it is additionally supplied with a hook which is intended to suspend the gas cylinder from a respective structure.

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Such a standard valve cap for a portable gas cylinder, in particular a gas cylinder containing oxygen, is described, for example, in US 5,429,152. The valve cap is intended to remain on the gas cylinder and cannot be removed from the gas cylinder.

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However, valve caps which are conventionally used for safeguarding and protecting the valve structure necessarily have certain openings which are used to access the respective gas outlets, hand wheels for operating the valve structure as well as observing manometers of the valve structure. Accordingly, the valve structure is always open such that dust and dirt may easily enter

and compromise the functionality of the gas cylinder and/or may contaminate the gas product stored in the gas cylinder itself.

In order to avoid contamination of the valve structure it has been common practice to cover the valve structure of the gas cylinder by placing a plastic bag, a shrink bag or a shrink film around it in order to avoid dust and moisture to enter the valve structure. However, placing the films around the valve structure is cumbersome and cannot be easily automated. Furthermore, it is difficult for the end user to remove the films before using such that this solution does not prove comfortable for the end user.

In addition, due to the open structure of the valve cap, it cannot be controlled whether the gas cylinder has been tampered with before it is actually used for the first time to administer the gas to a patient. Accordingly, it is attempted to seal-off the valve structure by means of the aforementioned plastic bag, shrink bag or shrink film.

Such a tamper-proof arrangement is also of relevance for all other gases such as industrial gases in order to make sure that the customer receives the gas in the form as originally filled into the gas cylinder by the supplier.

Summary

Accordingly, it is an objective of the present invention to improve the reliability of the valve structure in a gas cylinder having a valve cap.

The above-mentioned objective is solved by means of a cover for a valve cap of a gas cylinder with the features of claim 1. Advantageous embodiments of the invention are mentioned in the dependent claims.

Accordingly, the cover for a valve cap of a gas cylinder includes a cavity which is dimensioned to receive at least portions of the valve cap of the gas cylinder. According to the invention, the cover is made from a substantially rigid material.

In the cavity, portions of the valve cap can be received. However, depending on the geometry of the valve cap it is also contemplated that the entire valve cap is received in the cavity.

By means of the provision of a cover which is made from a substantially rigid material which covers at least portions of the valve cap of the gas cylinder, it becomes possible to improve the reliability of the valve structure because the valve cap of the gas cylinder is prevented from becoming
5 contaminated and tampered with because it is surrounded by the cover.

The provision of the rigid structure greatly affects the applicability of the cover to the valve cap such that this can be done in an automated manner – or at least with a significant reduction of manual labor. The cover can be placed around the valve cap and covers not only the valve cap but
10 – by securely covering the openings in the valve cap – also covers the valve structure. Because the material of the valve cap is substantially rigid, the cover provides a robust structure even when extending over the openings which are provided in the valve cap. Furthermore, because it is made from a rigid material, it will not be possible for a third party to tamper with the gas cylinder without this attempt being noticed. The rigid structure cannot easily be moved away in order to access the
15 hand wheel and/or the gas outlets unlike in the case of a flexible plastics bag, shrink bag or shrink film. Furthermore, the rigid cover prohibits any third party to access the openings in the valve cap and, thus, to reach with their hands and/or tools within the valve cap to tamper with the valve structure.

20 In this context it is to be noted that the valve cap which covers the valve unit of the gas cylinder is often also referred to as a "guard", a "cap" or a "Valve Protection Carry Handle" (VPCH).

The cover is preferably made from a thermoformable material, preferably a thermoformable plastics material, and is preferably made from PET (Polyethylene Terephthalate), PVC (Polyvinyl
25 Chloride), PCTFE (Polychlorotrifluoro ethylene) laminated to PVC, COC (Cyclic Olefin Copolymers), COP (Cyclic Olefin Polymers), preferably in multilayered combinations with PP (Polypropylene), PE (Polyethylene), or PETg (glycol-modified polyethylene terephthalate). By the provision of this material, a cost effective production of the cover can be achieved. With this type of material it is also possible to manufacture the cover such that it closely resembles the outer
30 proportions of the valve cap of the gas cylinder. The manufacturing process of molding and trimming a thermoformable plastics sheet such as to make a final product is well-known such that the cover can be manufactured easily, reliably and economically. In fact, the thermoforming process is even more economical than an injection process. Nevertheless, the cover could also be manufactured using an injection molding process such that the cover is injection molded.

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Preferably, the cover is provided in the form of a blister pack and/or a clamshell pack. These forms of packages enable an efficient production of the cover while ensuring that the integrity of the valve structure within the valve cap is maintained as long as the valve cap is received in the cover.

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In a preferred embodiment of the present invention, the cover comprises two half-shells which form the cavity for receiving portions of the valve cap when folded upon themselves. At the same time, the provision of two half-shells enables the cover to be formed to closely resemble the outer contours of the valve cap already because undercuts can be formed more easily.

10

In order to further improve the tamper-proof characteristics of the cover, the two half-shells are preferably interconnectable by means of at least one tamper-proof connector to form a tamper-proof cover. The tamper-proof connector is preferably made such that it can only be connected once and such that it is destroyed as soon as it is attempted to open the once closed connection again. By means of this tamper-proof connector it is ensured that a user can easily determine whether the gas cylinder is in the intended state, i.e. in the state it has left the facilities of the respective supplier, or whether the gas cylinder has been tampered with. This is of importance for all different fillings of a gas cylinder such as for medical gases, industrial gases as well as any other gases.

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Preferably, the two half-shells are connected via a foil hinge. The provision of a foil hinge enables even easier application of the cover to the valve cap because it can be easily folded around the valve cap.

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Preferably, the two half-shells can be interconnected by means of a tamper-proof connector, such as a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band, such that the cover can effectively be applied around the valve cap of the gas cylinder but cannot be removed anymore without being destroyed. When such a cover is applied to the valve cap once the gas cylinder has been filled at a filling site of a gas supplier or gas distributor, the end-user, e.g. the employee in the hospital, the end-user in a homecare application or the end user in an industrial application, can easily determine whether the gas cylinder is in its originally filled state or whether it has been tampered with. When the cover is fully intact and in place, the end-user can be certain that the gas cylinder and its contents have not been tampered with. Furthermore, the end-

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user can also be certain that the filling amount of the gas cylinder has not changed because it was not possible to release gas from the gas cylinder without having access to the valve structure.

In an alternative, the cover comprises more than two parts which form the cavity when connected.

- 5 By means of providing not only two half-shells but more than two parts of the cover for forming the cavity to receive at least portions of the valve cap, the cover may be adapted to specific geometries of the valve cap more easily. In particular, the division line between the respective parts of the cover can be defined such that the cover can be easily applied around the valve cap.

- 10 Preferably, the at least two parts are interconnectible by means of at least one tamper-proof connector to form a tamper-proof cover and/or wherein at least two parts are connected via a foil hinge and/or a tongue.

- 15 In a further preferred embodiment, the cavity is formed such that it fully surrounds the valve cap of the gas cylinder when applied to the valve cap. By fully enclosing the valve cap of the gas cylinder, the safety standard is further raised. Furthermore, by fully covering the valve cap of the gas cylinder, contamination of the valve structure situated inside the valve cap of the gas cylinder can be avoided.

- 20 The cover may be made in one piece, preferably by thermoforming a thermoformable plastics sheet, in order to increase its reliability and in order to reduce the cost of manufacturing. Of course, the one-piece cover could also be made by injection molding.

- 25 To be in a position to easily carry the gas cylinder, it is preferred that a handle portion is formed in the cavity, wherein this handle portion of the cover resembles a handle portion of the valve cap. Accordingly, a user can carry the gas cylinder by carrying it at the handle portion which is provided at the valve cap by gripping the handle portion of the cover. However, at the same time the contents of the valve cap are still secured because the cover is present as an outer layer. In other words, the user can determine whether the cover is still intact or whether the contents of the gas
30 cylinder have been tampered with.

In order to make surer that the cover is securely fitted to the gas cylinder, preferably a collar is formed in the cover which is intended to be arranged at a bottom portion of the valve cap. In an even more preferred embodiment, the collar defines an opening which has a diameter which is

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smaller than the largest diameter of the valve cap. By the provision of this collar it will become impossible to remove the cover from the valve cap by simply pulling it away from the gas cylinder without breaking at least the collar off the cover. Preferably, the collar is intended to encircle the valve unit between the valve cap and the actual gas cylinder such that the cover, in its closed and applied state, cannot be removed from the valve cap without being destroyed.

10 In yet another preferred embodiment, the cover is formed to hermetically enclose the valve cap of the gas cylinder when it is being applied to the valve cap. By means of this hermetic enclosure it is made sure that no third party can access any relevant portions of the valve structure without removing and – thus – destroying the cover.

15 The cavity defined by the cover is preferably suitable for receiving the valve cap of the gas cylinder in its entirety and the contours of the inside of the inner cavity preferably resemble the outer contours of the valve cap of the gas cylinder such that the cover sits closely and firmly on the valve cap of the gas cylinder. This has the advantage that contamination of the valve cap of the gas cylinder as well as the valve unit situated inside the valve cap can be safely avoided, and that it is avoided that the rigid cover is destroyed once the gas cylinder is tossed around because the wall thickness of the cover is not of relevance anymore but it is rather completely supported by the wall of the valve cap as such.

20 Preferably, the cover covers all openings of the valve cap of the gas cylinder such that contamination and inadvertent operation and tampering with the valve unit located inside the valve cap but usually accessible through the openings in the valve cap can be surely avoided.

25 In another preferable embodiment, the cover comprises a cavity which closely resembles or fits into the contours of a handle in the valve cap of the gas cylinder. By means of the provision of such a cavity it becomes possible carrying the gas cylinder in one hand even if the cover is still in place.

30 Preferably, the cover includes openings and/or cutouts for receiving a hook or any other fastening means situated at the valve cap of the gas cylinder.

Brief Description of the Figures

In the following, the present disclosure is further exemplified by means of the Figures of the drawings in which:

Figure 1 is a schematic, perspective view of an exemplary cover placed on a valve cap of a gas cylinder;

Figure 2 is a schematic, perspective view of the cover for a valve cap of a gas cylinder in an opened state, showing the inner cavity of the cover;

Figure 3 is a schematic, perspective view of the cover in a closed condition;

Figure 4 is a schematic side view of the cover placed on a valve cap of a gas cylinder; and

Figure 5 is a schematic perspective view of the opened cover of Figure 2 taken from a different perspective.

Detailed Description of the preferred Embodiments

In the following discussion of the preferred embodiments, similar elements are identified with identical reference numerals, and repeated description of the respective elements may be omitted in order to avoid redundancies in the specification.

Figure 1 shows, in a schematic perspective view, an assembly of a gas cylinder 1 with a valve cap 2 wherein the valve cap 2 is intended to enclose a valve structure or valve unit associated with the gas cylinder 1. In Figure 1, this valve structure is not explicitly shown but it is assumed to be located inside of the valve cap 2. The valve cap 2 is fixedly attached to the gas cylinder 1, e.g. by means of a set of screws 26 of the valve cap 2. In the embodiment shown in Figure 1, the valve cap 2 comprises at least two half-shells which are connected by means of the screws 26 such that a clamping action and/or form fit between valve cap 2 and gas cylinder 1 is achieved such that the valve cap 2 is fixedly attached to the gas cylinder 1.

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A cover 3 for covering the valve cap 2 of the gas cylinder 1 is provided, wherein the cover 3 includes a rigid material and forms a cavity for receiving the valve cap 2 of the gas cylinder 1. In the embodiments shown in the Figures, cover 3 comprises at least two half-shells 30, 32, wherein the two half-shells 30, 32 form the cavity when they are connected to one another such that the valve cap 2 can be fully received in the cavity.

The gas cylinder 1 is preferably a portable gas cylinder which is typically used in homecare applications and emergency applications in hospitals or to supply gas when a patient is transported within a hospital. In order to qualify to be portable, the volume of the gas cylinder 1 is preferably in a range of between 1 and 15 liters such that the weight of the gas cylinder 1 can still be handled by medical personnel, preferably singlehanded.

The valve cap 2 is fixedly attached to the gas cylinder 1 and is intended to safeguard and protect a valve unit of the gas cylinder 1. The valve unit is fully received inside of the volume defined by the valve cap 2 and serves to output gas from the gas cylinder 1 to the respective users. The valve unit, therefore, includes at least one gas outlet and typically at least one hand-wheel for opening and closing the valve. In preferred embodiments, the valve unit furthermore includes a low pressure output wherein the low pressure is achieved by means of an internal pressure regulator. In further preferred embodiments, a manometer is provided in order to monitor the pressure of the gas received in the gas cylinder 1.

In order to access the respective gas outputs, hand-wheels and manometers, openings 20 are present in the valve cap 2. Through these openings 20 the different elements of the valve unit can be accessed by a user in order to operate the gas cylinder 1.

A hook 22 is also present and is directly attached to the valve cap 2, wherein the hook 22 is intended to hang the gas cylinder 1 to a structure while in use.

The valve cap 2, furthermore, comprises a handle portion 24 which allows a user to carry the gas cylinder 1 conveniently by simply gripping the handle portion 24 with one hand.

The cover 3 preferably covers the entire valve cap 2 such that it fully surrounds the valve cap 2. Preferably, all openings 20 of the valve cap 2 are fully covered by the cover 3 in order to make sure that the valve unit is protected during transport from being contaminated. Furthermore, such a

full cover provides a tamper-proof arrangement which ensures that the gas cylinder 1 is fully filled when it arrives at the respective customer and to make sure that nobody has tampered with the contents of the gas cylinder 1.

5 Preferably, the cover 3 includes at least one opening or cavity 34 at the position where the handle 24 of the valve cap 2 is located. In particular, the cover 3 preferably closely resembles the outer contours of the valve cap 2 particularly at the handle 24 such that the gas cylinder 1 can be easily carried by gripping it at the handle 24 even if the cover 3 is in place.

10 The cover 3, furthermore, includes a cut-out 36 at a position where the hook 22 of the valve cap 2 is provided such that the hook 22 can still be used.

As can be seen in Figure 1, the cover 3 closely resembles the outer contours of the valve cap 2. The close resemblance of the cover 3 to the valve cap 2 has, inter alia, the advantage that the
15 cover 3 cannot be easily removed and that the cover 3 receives structural integrity from the directly supporting valve cap material.

Figures 2 and 5 show the cover 3 in its opened state. The cover 3 comprises a first half-shell 30 and a second half-shell 32 which are connected with respect to one another by means of a foil
20 hinge 300 and/or at least one tongue.

Preferably, the first half-shell 30, the second half-shell 32 as well as the foil hinge are manufactured by deep-drawing a suitable material or by casting the respective material integrally. In other words, the two half-shells and its connection are preferably made in one piece from a
25 sheet of a suitable plastics material such as a sheet of PET (Polyethylene Terephthalate) or PVC (Polyvinyl Chloride). Other suitable materials include PCTFE (Polychlorotrifluoro ethylene) laminated to PVC, or COC (Cyclic Olefin Copolymers), or COP (Cyclic Olefin Polymers) which are provided in order to improve the moisture barrier, preferably in multilayered combinations with PP (Polypropylene), PE (Polyethylene), or PETg (glycol-modified polyethylene terephthalate).

30 In an alternative, an injection molding process could be used for manufacturing the cover 3 as well.

The foil hinge 300 is used to pivot the two half-shells 30, 32 with respect to one another in order to close the cover 3 in the form as it is shown in Figure 3 and to form the cavity which is dimensioned

to receive the valve cap 2 of the gas cylinder 1. In an alternative or further development which is not shown in the Figures the two half-shells 30, 32 are connected via tongues.

In an alternative which is not shown in the Figures, the cover 3 comprises more than two parts which form the cavity when connected. Preferably, the at least two parts are interconnectible by means of at least one tamper-proof connector to form a tamper-proof cover and/or wherein at least two parts are connected via a foil hinge and/or a tongue.

In order to close the cover 3 shown in the Figures and keep it in the closed condition, fastening means 310 are provided. The fastening means 310 comprise a bolt 312 as well as a corresponding receiving opening 314. The bolt 312 is dimensioned to be received in the receiving opening 314 such that a fixed connection is formed upon insertion of the bolt 312 into the opening 314.

In an alternative or further development the connection can also be provided in the form of a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band.

In the preferred embodiment shown in the Figures, the connection cannot be reopened without destroying the material of the cover 3. In this respect, the dome-shaped material surrounding the openings 314 interacts with a bead 316 of the bolts 312 such that when the bolts 312 are inserted through the openings 314, the dome-shaped material is elastically extended and retracted after the bead 316 has passed the material. Accordingly, the dome-shaped material surrounding the opening 314 rests behind the bead 316. When it is attempted to reopen the cover 3, the dome-shaped portions surrounding the opening 314 are destroyed. In other words, the connection is formed as a frangible connection such that it results in a tamper-proof arrangement.

The tamper-proof arrangement is particularly suitable for gas cylinders which are used to distribute medical gases or industrial gases because it enables the end-user to determine whether the gas cylinder has been tampered with such that the end user can make sure that the gas cylinder contains the expected gas.

In order to be received at a handle portion of the valve cap of a gas cylinder, a cavity 32 is present in the cover 3. When considering Figure 2, it becomes immediately apparent that this cavity 32 also serves to carry the gas cylinder singlehanded.

The interconnection of the bolts 312 with the dome-shaped material surrounding the openings 314 leads to a tamper-proof sealing of the cover once it has been set in place enclosed on the valve cap 2. In fact, as can be seen in Figure 3, the cover 3 can only be removed by destroying either the connection between the bolts 312 and the dome-shaped material around the openings 314, by
5 destroying the foil hinge 300, or by destroying any other portion of the material of the cover 3. In other words, the cover 3 cannot be removed without being destroyed.

Accordingly, the cover 3 serves as a tamper-proof member in the sense that a user can take from the condition of the cover 3 whether it has been tampered with the gas cylinder or whether it is in
10 its intended state.

The two half-shells 30, 32 include, in their bottom portion, a collar 320, wherein this collar 320 is intended to be inserted below the lower portion of the valve cap 2 of the gas cylinder 1 when the cover 3 is in its intended, closed state. The position of the collar 320 of the cover 3 in the closed
15 state of the cover 3 is schematically shown in Figure 1.

The collar portions 320 combine to a full collar once the two half-shells 30, 32 are folded upon one another. This can be clearly seen in Figure 3, in which the bottom portion of the cover 3 including the collar 320 is situated in the upper portion of the Figure. In fact, the opening 322 which remains
20 at the inner diameter of the collar 320 is intended to receive the valve unit but is intended to have a diameter smaller than the lower diameter of the valve cap 2 of the gas cylinder 1.

The top portion of the cover 3 is intended to close the cavity which is formed when the two half-shells 30, 32 are folded upon one another. To this end, an upper portion 330 of the cover 3 is
25 provided in the second half-shell 32, which is intended to cooperate with a protrusion 332 in the first half-shell 30 in order to close the cover 3 when the two half-shells 30, 32 are folded upon one another. The protrusion 332 is intended to be slid below the upper portion 330 of the cover 3 once the first and second half-shells are folded upon one another.

The inner cavities 340 and 342 of the respective half-shells 30 and 32 are preferably shaped such that they closely resemble the outer contours of the valve cap 2 of the gas cylinder 1. By this measure, not only an efficient way of transporting the gas cylinder 1 can be achieved but also a
30 higher degree of resistance of the cover can be achieved.

Claims

1. Cover (3) for a valve cap (2) of a gas cylinder (1), wherein the cover (3) includes a cavity (340, 342) which is dimensioned to receive at least a portion of the valve cap (2) of the gas cylinder (1),

characterized in that

the cover (3) is made from a substantially rigid material.

2. Cover (3) according to claim 1, wherein the cover (3) is made from a thermoformable material, preferably a thermoformable plastics material, preferably made from PET (Polyethylene Terephthalate), PVC (Polyvinyl Chloride), PCTFE (Polychlorotrifluoro Ethylene) laminated to PVC, COC (Cyclic Olefin Copolymers), COP (Cyclic Olefin Polymers), preferably in multilayered combinations with PP (Polypropylene), PE (Polyethylene), or PETg (glycol-modified Polyethylene Terephthalate) or the cover (3) is injection molded.
3. Cover (3) according to claim 1 or 2, wherein the cover (3) is provided in the form of a blister pack and/or a clamshell pack.
4. Cover (3) according to any one of the preceding claims, wherein the cover includes a tamper-proof connecting mechanism (310, 312, 314, 316), preferably in form of a frangible connecting arrangement, more preferably in the form of a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band.
5. Cover (3) according to any one of the preceding claims, comprising two half-shells (30, 32) which form the cavity (340, 342) for receiving portions of the valve cap (2) when folded upon themselves.
6. Cover (3) according to claim 5, wherein the two half-shells (30, 32) are interconnectible by means of at least one tamper-proof connector (310, 312, 314, 316) to form a tamper-proof cover.

7. Cover (3) according to claim 5 or 6, wherein the two half-shells (30, 32) are connected via a foil hinge (300) and/or a tongue.
- 5 8. Cover (3) according to any one of claims 1 to 4, comprising more than two parts which form the cavity when connected.
- 10 9. Cover (3) according to claim 8, wherein at least two parts are interconnectible by means of at least one tamper-proof connector, preferably in the form of a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band, to form a tamper-proof cover and/or wherein at least two parts are connected via a foil hinge (300) and/or a tongue.
- 15 10. Cover (3) according to any one of the preceding claims, wherein the cavity is formed such that it fully surrounds the valve cap (2) of the gas cylinder (1) when applied to the valve cap (2).
- 20 11. Cover (3) according to any one of the preceding claims, wherein the cover (3) is made in one piece, preferably by thermoforming a thermoformable plastics sheet or by injection molding.
- 25 12. Cover (3) according to any one of the preceding claims, wherein a handle portion (32) of the cavity, resembling a handle portion (24) of the valve cap (2), is formed in the cover (3).
13. Cover (3) according to any one of the preceding claims, wherein a collar (320) is formed in the cover (3) which is intended to be arranged at a bottom portion of the valve cap (2).
14. Cover (3) according to claim 13, wherein the collar (320) defines an opening (322) having a diameter smaller than the largest diameter of the valve cap (2).
- 30 15. Cover (3) according to any one of the preceding claims, wherein the cover is formed to hermetically seal off the valve cap (2) of the gas cylinder (1) when being applied to the valve cap (2).

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16. Cover (3) according to any one of the preceding claims, wherein openings for receiving a hook or any other fastening means situated at the valve cap of the gas cylinder are provided.

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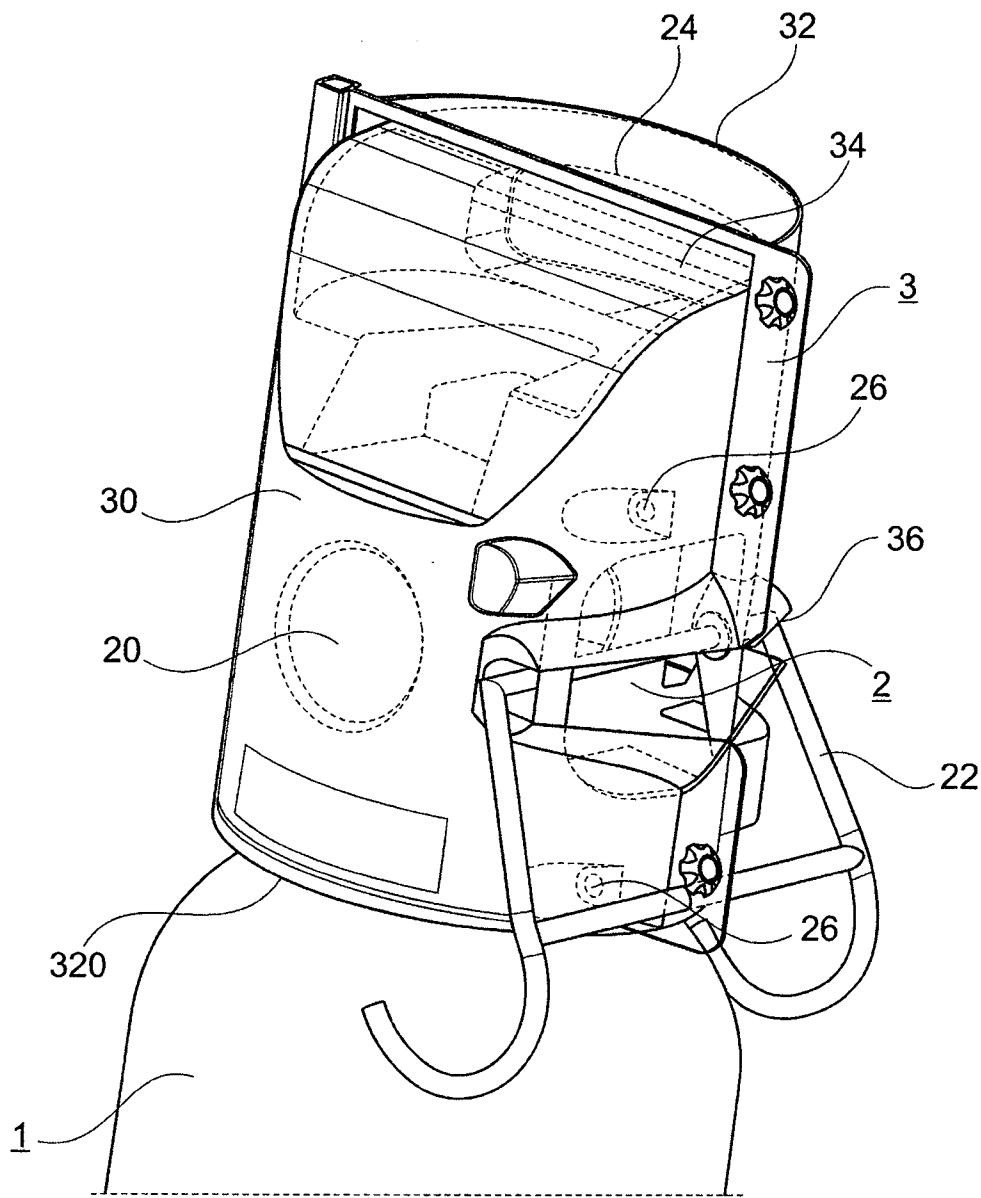


Fig. 1

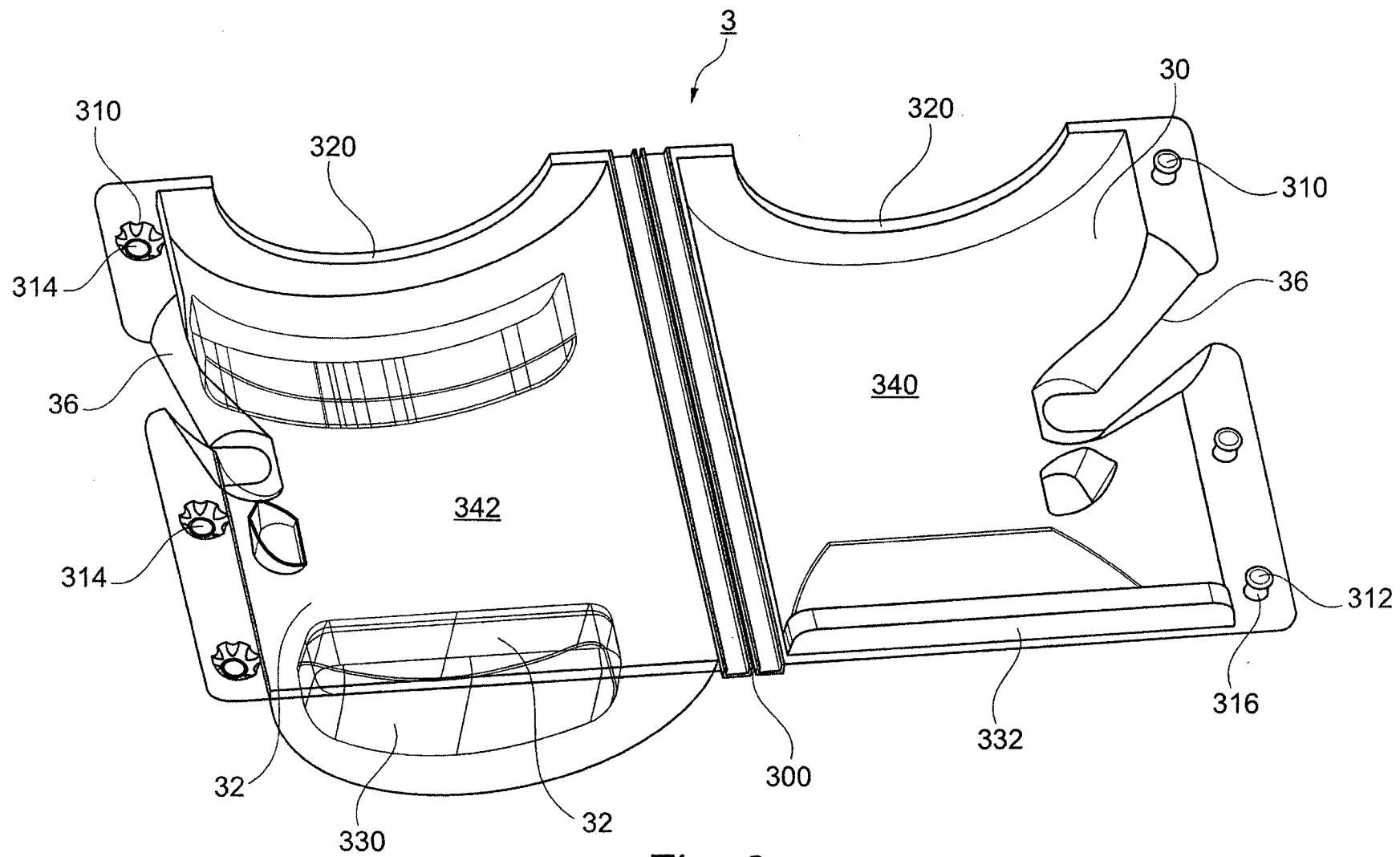


Fig. 2

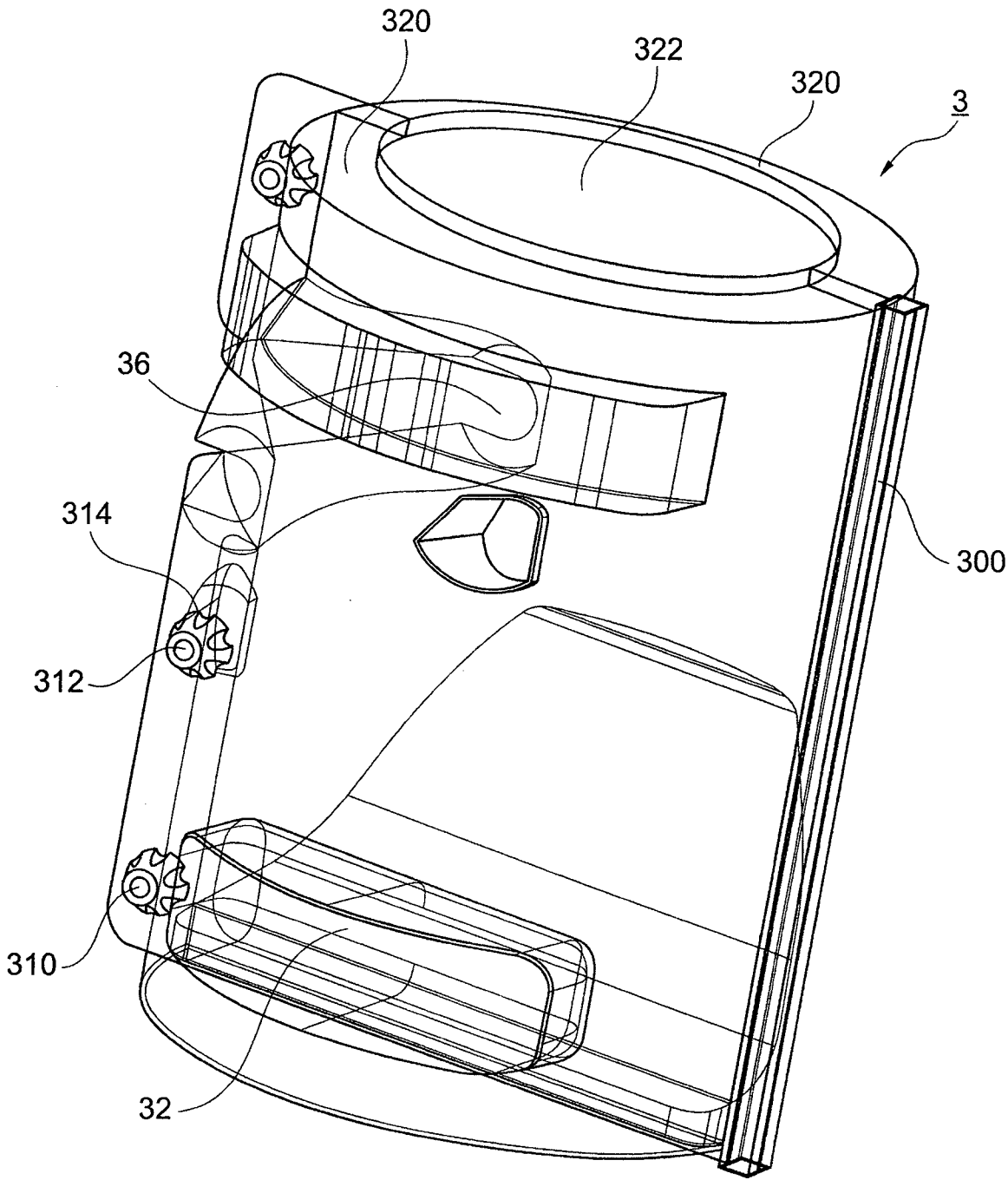


Fig. 3

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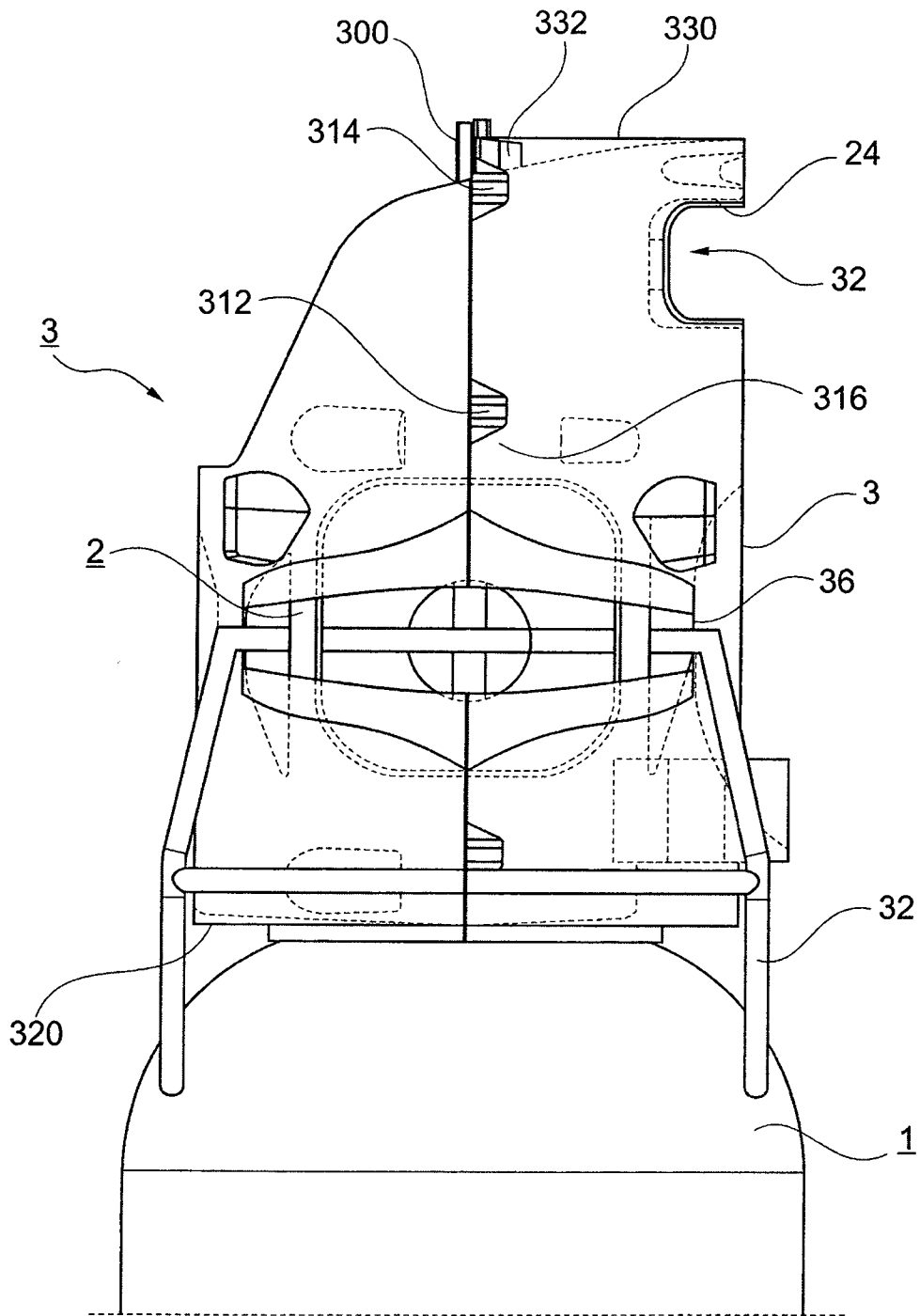


Fig. 4

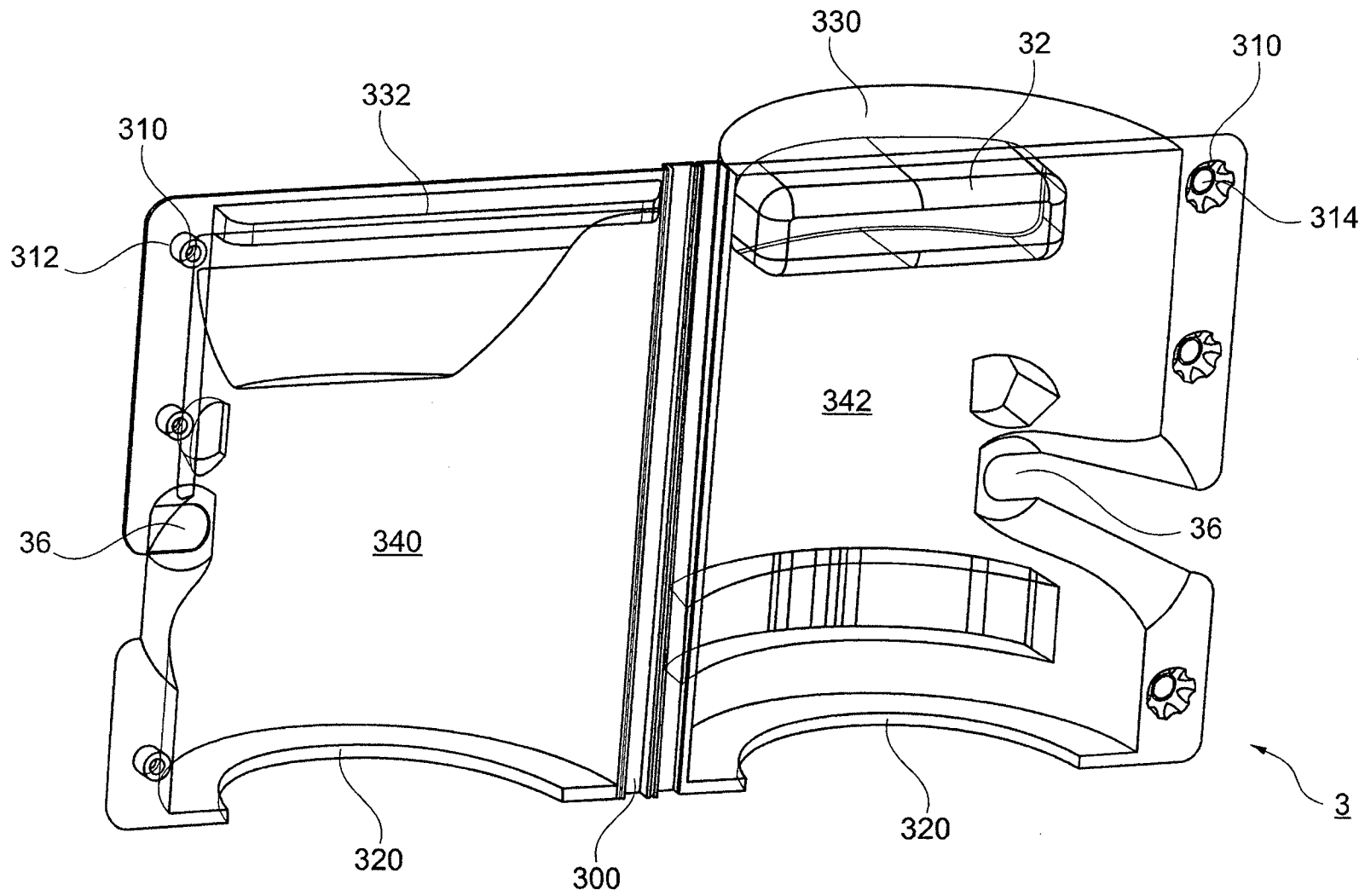


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/071129

A. CLASSIFICATION OF SUBJECT MATTER INV. A61M16/20 F17C13/06 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A61M F17C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 16 November 2012		Date of mailing of the international search report 23/11/2012
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Stängl, Gerhard

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/071129

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International application No

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Bescheinigung

Certificate

Attestation

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The attached documents are
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Patentanmeldung Nr.

Patent application No.

Demande de brevet n°

11186984.8 / EP11186984

The organization code and number of your priority application, to be used for filing abroad under the Paris Convention, is EP11186984.

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
p.o.

 
U. Ingmann

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Bezeichnung der Erfindung / Title of the invention / Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se référer à la description.)

Cover for a valve cap of a gas cylinder

In Anspruch genommene Priorität(en) / Priority(Priorities) claimed / Priorité(s) revendiquée(s)
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Linde AG

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Cover for a valve cap of a gas cylinder

Technical Field

10 The present invention pertains to a cover for a valve cap of a gas cylinder, preferably to a cover for a valve cap of a portable gas cylinder containing medical gases.

Technological Background

15 In the field of the distribution of medical gases it is known to distribute gases by means of gas cylinders. Specialty medical gases such as helium or nitrous oxide or standard medical gases such as oxygen and medical air are distributed to the respective hospitals or treatment centers in gas cylinders. In an alternative distribution channel, the gas cylinders are directly delivered to the home of a patient in order to be used in homecare applications. The gas cylinders are then either
20 connected to a piping system in the hospital or in an emergency vehicle, or are directly used at the administration site, for example directly at a patient's bed.

In the latter case, the gas cylinders are preferably relatively small such that they are easily portable. The provision of portable gas cylinders obviates the need to provide gas outlets of a
25 hospital pipeline system at the patient's bed and/or offers the possibility to relocate the respective patient easily within the hospital without interrupting the gas supply because the gas cylinder can be moved together with the bed of the patient. Furthermore, portable gas cylinders can be easily suspended in the vicinity of the bed of the patient by means of a hook provided at the gas cylinder which can be connected to a structure of the patient's bed.

30

The gas cylinders which are used in the medical field are typically fitted with a specific valve structure which is fixedly secured to the outlet portion of the gas cylinder such that the user can start administering the gas from the gas cylinder immediately without the need for mounting any valve components to the gas cylinder such as a pressure regulator. At the same time, the supplier

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of the gas cylinder can be sure that the valve structure is tailored to the specific specifications of the respective gas. In order to improve the mechanical integrity and in order to safeguard the delicate valve structure, the gas cylinder usually carries a valve cap around the valve structure wherein this valve cap is typically fixedly attached to the gas cylinder and/or to the valve structure.

5

Such a conventional valve cap of a gas cylinder usually has several openings through which the valve structure can be accessed such that a gas outlet and a hand wheel for opening and closing the valve are accessible whilst the valve cap remains fixedly attached to the gas cylinder. In preferred embodiments of these conventional caps, the openings are formed such that a user is additionally enabled to read a manometer and/or to connect a gas conduit to a separate low pressure gas outlet.

10

It should be noted that if a valve structure of a gas cylinder should ever be broken off whilst the gas is still present under high pressure in the cylinder, the gas in the cylinder would, upon escaping, tend to give the gas cylinder rocket propulsion. As this condition is very dangerous and needs to be avoided by any means, the above-mentioned valve caps of the gas cylinders are fixedly attached to the gas cylinders or valve structures and are dimensioned to provide adequate mechanical resistance against the occurrence of damages to the valve structure.

15

In addition, conventional valve caps may serve as a handle for conveniently carrying the gas cylinder. In order to serve as a handle, the valve cap may comprise a specific handle portion such as – for example – a cutout in the wall of the valve cap which enables a user to easily carry the portable gas cylinder. In a further embodiment of the conventional valve caps, it is additionally supplied with a hook which is intended to suspend the gas cylinder from a respective structure.

20

25

Such a standard valve cap for a portable gas cylinder, in particular a gas cylinder containing oxygen, is described, for example, in US 5,429,152. The valve cap is intended to remain on the gas cylinder and cannot be removed from the gas cylinder.

30

However, valve caps which are conventionally used for safeguarding and protecting the valve structure necessarily have certain openings which are used to access the respective gas outlets, hand wheels for operating the valve structure as well as observing manometers of the valve structure. Accordingly, the valve structure is always open such that dust and dirt may easily enter

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and compromise the functionality of the gas cylinder and/or may contaminate the gas product stored in the gas cylinder itself.

5 In order to avoid contamination of the valve structure it has been common practice to cover the valve structure of the gas cylinder by placing a plastic bag, a shrink bag or a shrink film around it in order to avoid dust and moisture to enter the valve structure. However, placing the films around the valve structure is cumbersome and cannot be easily automated. Furthermore, it is difficult for the end user to remove the films before using such that this solution does not prove comfortable for the end user.

10

In addition, due to the open structure of the valve cap, it cannot be controlled whether the gas cylinder has been tampered with before it is actually used for the first time to administer the gas to a patient. Accordingly, it is attempted to seal-off the valve structure by means of the aforementioned plastic bag, shrink bag or shrink film.

15

Such a tamper-proof arrangement is also of relevance for all other gases such as industrial gases in order to make sure that the customer receives the gas in the form as originally filled into the gas cylinder by the supplier.

20 Summary

Accordingly, it is an objective of the present invention to improve the reliability of the valve structure in a gas cylinder having a valve cap.

25 The above-mentioned objective is solved by means of a cover for a valve cap of a gas cylinder with the features of claim 1. Advantageous embodiments of the invention are mentioned in the dependent claims.

30 Accordingly, the cover for a valve cap of a gas cylinder includes a cavity which is dimensioned to receive at least portions of the valve cap of the gas cylinder. According to the invention, the cover is made from a substantially rigid material.

In the cavity, portions of the valve cap can be received. However, depending on the geometry of the valve cap it is also contemplated that the entire valve cap is received in the cavity.

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By means of the provision of a cover which is made from a substantially rigid material which covers at least portions of the valve cap of the gas cylinder, it becomes possible to improve the reliability of the valve structure because the valve cap of the gas cylinder is prevented from becoming
5 contaminated and tampered with because it is surrounded by the cover.

The provision of the rigid structure greatly affects the applicability of the cover to the valve cap such that this can be done in an automated manner – or at least with a significant reduction of manual labor. The cover can be placed around the valve cap and covers not only the valve cap but
10 – by securely covering the openings in the valve cap – also covers the valve structure. Because the material of the valve cap is substantially rigid, the cover provides a robust structure even when extending over the openings which are provided in the valve cap. Furthermore, because it is made from a rigid material, it will not be possible for a third party to tamper with the gas cylinder without this attempt being noticed. The rigid structure cannot easily be moved away in order to access the
15 hand wheel and/or the gas outlets unlike in the case of a flexible plastics bag, shrink bag or shrink film. Furthermore, the rigid cover prohibits any third party to access the openings in the valve cap and, thus, to reach with their hands and/or tools within the valve cap to tamper with the valve structure.

20 In this context it is to be noted that the valve cap which covers the valve unit of the gas cylinder is often also referred to as a “guard”, a “cap” or a “Valve Protection Carry Handle” (VPCH).

The cover is preferably made from a thermoformable material, preferably a thermoformable plastics material, and is preferably made from PET (Polyethylene Terephthalate), PVC (Polyvinyl
25 Chloride), PCTFE (Polychlorotrifluoro ethylene) laminated to PVC, COC (Cyclic Olefin Copolymers), COP (Cyclic Olefin Polymers), preferably in multilayered combinations with PP (Polypropylene), PE (Polyethylene), or PETg (glycol-modified polyethylene terephthalate). By the provision of this material, a cost effective production of the cover can be achieved. With this type of material it is also possible to manufacture the cover such that it closely resembles the outer
30 proportions of the valve cap of the gas cylinder. The manufacturing process of molding and trimming a thermoformable plastics sheet such as to make a final product is well-known such that the cover can be manufactured easily, reliably and economically. In fact, the thermoforming process is even more economical than an injection process. Nevertheless, the cover could also be manufactured using an injection molding process such that the cover is injection molded.

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Preferably, the cover is provided in the form of a blister pack and/or a clamshell pack. These forms of packages enable an efficient production of the cover while ensuring that the integrity of the valve structure within the valve cap is maintained as long as the valve cap is received in the cover.

5

In a preferred embodiment of the present invention, the cover comprises two half-shells which form the cavity for receiving portions of the valve cap when folded upon themselves. At the same time, the provision of two half-shells enables the cover to be formed to closely resemble the outer contours of the valve cap already because undercuts can be formed more easily.

10

In order to further improve the tamper-proof characteristics of the cover, the two half-shells are preferably interconnectable by means of at least one tamper-proof connector to form a tamper-proof cover. The tamper-proof connector is preferably made such that it can only be connected once and such that it is destroyed as soon as it is attempted to open the once closed connection again. By means of this tamper-proof connector it is ensured that a user can easily determine whether the gas cylinder is in the intended state, i.e. in the state it has left the facilities of the respective supplier, or whether the gas cylinder has been tampered with. This is of importance for all different fillings of a gas cylinder such as for medical gases, industrial gases as well as any other gases.

20

Preferably, the two half-shells are connected via a foil hinge. The provision of a foil hinge enables even easier application of the cover to the valve cap because it can be easily folded around the valve cap.

25

Preferably, the two half-shells can be interconnected by means of a tamper-proof connector, such as a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band, such that the cover can effectively be applied around the valve cap of the gas cylinder but cannot be removed anymore without being destroyed. When such a cover is applied to the valve cap once the gas cylinder has been filled at a filling site of a gas supplier or gas distributor, the end-user, e.g. the employee in the hospital, the end-user in a homecare application or the end user in an industrial application, can easily determine whether the gas cylinder is in its originally filled state or whether it has been tampered with. When the cover is fully intact and in place, the end-user can be certain that the gas cylinder and its contents have not been tampered with. Furthermore, the end-

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user can also be certain that the filling amount of the gas cylinder has not changed because it was not possible to release gas from the gas cylinder without having access to the valve structure.

In an alternative, the cover comprises more than two parts which form the cavity when connected.

- 5 By means of providing not only two half-shells but more than two parts of the cover for forming the cavity to receive at least portions of the valve cap, the cover may be adapted to specific geometries of the valve cap more easily. In particular, the division line between the respective parts of the cover can be defined such that the cover can be easily applied around the valve cap.

- 10 Preferably, the at least two parts are interconnectible by means of at least one tamper-proof connector to form a tamper-proof cover and/or wherein at least two parts are connected via a foil hinge and/or a tongue.

- 15 In a further preferred embodiment, the cavity is formed such that it fully surrounds the valve cap of the gas cylinder when applied to the valve cap. By fully enclosing the valve cap of the gas cylinder, the safety standard is further raised. Furthermore, by fully covering the valve cap of the gas cylinder, contamination of the valve structure situated inside the valve cap of the gas cylinder can be avoided.

- 20 The cover may be made in one piece, preferably by thermoforming a thermoformable plastics sheet, in order to increase its reliability and in order to reduce the cost of manufacturing. Of course, the one-piece cover could also be made by injection molding.

- 25 To be in a position to easily carry the gas cylinder, it is preferred that a handle portion is formed in the cavity, wherein this handle portion of the cover resembles a handle portion of the valve cap. Accordingly, a user can carry the gas cylinder by carrying it at the handle portion which is provided at the valve cap by gripping the handle portion of the cover. However, at the same time the contents of the valve cap are still secured because the cover is present as an outer layer. In other words, the user can determine whether the cover is still intact or whether the contents of the gas
30 cylinder have been tampered with.

In order to make surer that the cover is securely fitted to the gas cylinder, preferably a collar is formed in the cover which is intended to be arranged at a bottom portion of the valve cap. In an even more preferred embodiment, the collar defines an opening which has a diameter which is

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smaller than the largest diameter of the valve cap. By the provision of this collar it will become impossible to remove the cover from the valve cap by simply pulling it away from the gas cylinder without breaking at least the collar off the cover. Preferably, the collar is intended to encircle the valve unit between the valve cap and the actual gas cylinder such that the cover, in its closed and
5 applied state, cannot be removed from the valve cap without being destroyed.

In yet another preferred embodiment, the cover is formed to hermetically enclose the valve cap of the gas cylinder when it is being applied to the valve cap. By means of this hermetic enclosure it is made sure that no third party can access any relevant portions of the valve structure without
10 removing and – thus – destroying the cover.

The cavity defined by the cover is preferably suitable for receiving the valve cap of the gas cylinder in its entirety and the contours of the inside of the inner cavity preferably resemble the outer contours of the valve cap of the gas cylinder such that the cover sits closely and firmly on the valve
15 cap of the gas cylinder. This has the advantage that contamination of the valve cap of the gas cylinder as well as the valve unit situated inside the valve cap can be safely avoided, and that it is avoided that the rigid cover is destroyed once the gas cylinder is tossed around because the wall thickness of the cover is not of relevance anymore but it is rather completely supported by the wall of the valve cap as such.

20 Preferably, the cover covers all openings of the valve cap of the gas cylinder such that contamination and inadvertent operation and tampering with the valve unit located inside the valve cap but usually accessible through the openings in the valve cap can be surely avoided.

25 In another preferable embodiment, the cover comprises a cavity which closely resembles or fits into the contours of a handle in the valve cap of the gas cylinder. By means of the provision of such a cavity it becomes possible carrying the gas cylinder in one hand even if the cover is still in place.

30 Preferably, the cover includes openings and/or cutouts for receiving a hook or any other fastening means situated at the valve cap of the gas cylinder.

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Brief Description of the Figures

In the following, the present disclosure is further exemplified by means of the Figures of the
 5 drawings in which:

- Figure 1 is a schematic, perspective view of an exemplary cover placed on a valve cap of a gas cylinder;
- 10 Figure 2 is a schematic, perspective view of the cover for a valve cap of a gas cylinder in an opened state, showing the inner cavity of the cover;
- Figure 3 is a schematic, perspective view of the cover in a closed condition;
- 15 Figure 4 is a schematic side view of the cover placed on a valve cap of a gas cylinder; and
- Figure 5 is a schematic perspective view of the opened cover of Figure 2 taken from a different perspective.

20 Detailed Description of the preferred Embodiments

In the following discussion of the preferred embodiments, similar elements are identified with identical reference numerals, and repeated description of the respective elements may be omitted in order to avoid redundancies in the specification.

25

Figure 1 shows, in a schematic perspective view, an assembly of a gas cylinder 1 with a valve cap 2 wherein the valve cap 2 is intended to enclose a valve structure or valve unit associated with the gas cylinder 1. In Figure 1, this valve structure is not explicitly shown but it is assumed to be located inside of the valve cap 2. The valve cap 2 is fixedly attached to the gas cylinder 1, e.g. by means of a set of screws 26 of the valve cap 2. In the embodiment shown in Figure 1, the valve cap 2 comprises at least two half-shells which are connected by means of the screws 26 such that a clamping action and/or form fit between valve cap 2 and gas cylinder 1 is achieved such that the valve cap 2 is fixedly attached to the gas cylinder 1.

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A cover 3 for covering the valve cap 2 of the gas cylinder 1 is provided, wherein the cover 3 includes a rigid material and forms a cavity for receiving the valve cap 2 of the gas cylinder 1. In the embodiments shown in the Figures, cover 3 comprises at least two half-shells 30, 32, wherein the two half-shells 30, 32 form the cavity when they are connected to one another such that the
5 valve cap 2 can be fully received in the cavity.

The gas cylinder 1 is preferably a portable gas cylinder which is typically used in homecare applications and emergency applications in hospitals or to supply gas when a patient is transported within a hospital. In order to qualify to be portable, the volume of the gas cylinder 1 is preferably in
10 a range of between 1 and 15 liters such that the weight of the gas cylinder 1 can still be handled by medical personnel, preferably singlehanded.

The valve cap 2 is fixedly attached to the gas cylinder 1 and is intended to safeguard and protect a valve unit of the gas cylinder 1. The valve unit is fully received inside of the volume defined by the
15 valve cap 2 and serves to output gas from the gas cylinder 1 to the respective users. The valve unit, therefore, includes at least one gas outlet and typically at least one hand-wheel for opening and closing the valve. In preferred embodiments, the valve unit furthermore includes a low pressure output wherein the low pressure is achieved by means of an internal pressure regulator. In further preferred embodiments, a manometer is provided in order to monitor the pressure of the
20 gas received in the gas cylinder 1.

In order to access the respective gas outputs, hand-wheels and manometers, openings 20 are present in the valve cap 2. Through these openings 20 the different elements of the valve unit can be accessed by a user in order to operate the gas cylinder 1.
25

A hook 22 is also present and is directly attached to the valve cap 2, wherein the hook 22 is intended to hang the gas cylinder 1 to a structure while in use.

The valve cap 2, furthermore, comprises a handle portion 24 which allows a user to carry the gas
30 cylinder 1 conveniently by simply gripping the handle portion 24 with one hand.

The cover 3 preferably covers the entire valve cap 2 such that it fully surrounds the valve cap 2. Preferably, all openings 20 of the valve cap 2 are fully covered by the cover 3 in order to make sure that the valve unit is protected during transport from being contaminated. Furthermore, such a

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full cover provides a tamper-proof arrangement which ensures that the gas cylinder 1 is fully filled when it arrives at the respective customer and to make sure that nobody has tampered with the contents of the gas cylinder 1.

- 5 Preferably, the cover 3 includes at least one opening or cavity 34 at the position where the handle 24 of the valve cap 2 is located. In particular, the cover 3 preferably closely resembles the outer contours of the valve cap 2 particularly at the handle 24 such that the gas cylinder 1 can be easily carried by gripping it at the handle 24 even if the cover 3 is in place.
- 10 The cover 3, furthermore, includes a cut-out 36 at a position where the hook 22 of the valve cap 2 is provided such that the hook 22 can still be used.

As can be seen in Figure 1, the cover 3 closely resembles the outer contours of the valve cap 2. The close resemblance of the cover 3 to the valve cap 2 has, inter alia, the advantage that the cover 3 cannot be easily removed and that the cover 3 receives structural integrity from the directly supporting valve cap material.

Figures 2 and 5 show the cover 3 in its opened state. The cover 3 comprises a first half-shell 30 and a second half-shell 32 which are connected with respect to one another by means of a foil hinge 300 and/or at least one tongue.

Preferably, the first half-shell 30, the second half-shell 32 as well as the foil hinge are manufactured by deep-drawing a suitable material or by casting the respective material integrally. In other words, the two half-shells and its connection are preferably made in one piece from a sheet of a suitable plastics material such as a sheet of PET (Polyethylene Terephthalate) or PVC (Polyvinyl Chloride). Other suitable materials include PCTFE (Polychlorotrifluoro ethylene) laminated to PVC, or COC (Cyclic Olefin Copolymers), or COP (Cyclic Olefin Polymers) which are provided in order to improve the moisture barrier, preferably in multilayered combinations with PP (Polypropylene), PE (Polyethylene), or PETg (glycol-modified polyethylene terephthalate).

In an alternative, an injection molding process could be used for manufacturing the cover 3 as well.

The foil hinge 300 is used to pivot the two half-shells 30, 32 with respect to one another in order to close the cover 3 in the form as it is shown in Figure 3 and to form the cavity which is dimensioned

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to receive the valve cap 2 of the gas cylinder 1. In an alternative or further development which is not shown in the Figures the two half-shells 30, 32 are connected via tongues.

In an alternative which is not shown in the Figures, the cover 3 comprises more than two parts
5 which form the cavity when connected. Preferably, the at least two parts are interconnectible by means of at least one tamper-proof connector to form a tamper-proof cover and/or wherein at least two parts are connected via a foil hinge and/or a tongue.

In order to close the cover 3 shown in the Figures and keep it in the closed condition, fastening
10 means 310 are provided. The fastening means 310 comprise a bolt 312 as well as a corresponding receiving opening 314. The bolt 312 is dimensioned to be received in the receiving opening 314 such that a fixed connection is formed upon insertion of the bolt 312 into the opening 314.

In an alternative or further development the connection can also be provided in the form of a clip, a
15 thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band.

In the preferred embodiment shown in the Figures, the connection cannot be reopened without destroying the material of the cover 3. In this respect, the dome-shaped material surrounding the openings 314 interacts with a bead 316 of the bolts 312 such that when the bolts 312 are inserted
20 through the openings 314, the dome-shaped material is elastically extended and retracted after the bead 316 has passed the material. Accordingly, the dome-shaped material surrounding the opening 314 rests behind the bead 316. When it is attempted to reopen the cover 3, the dome-shaped portions surrounding the opening 314 are destroyed. In other words, the connection is formed as a frangible connection such that it results in a tamper-proof arrangement.

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The tamper-proof arrangement is particularly suitable for gas cylinders which are used to distribute medical gases or industrial gases because it enables the end-user to determine whether the gas cylinder has been tampered with such that the end user can make sure that the gas cylinder contains the expected gas.

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In order to be received at a handle portion of the valve cap of a gas cylinder, a cavity 32 is present in the cover 3. When considering Figure 2, it becomes immediately apparent that this cavity 32 also serves to carry the gas cylinder singlehanded.

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The interconnection of the bolts 312 with the dome-shaped material surrounding the openings 314 leads to a tamper-proof sealing of the cover once it has been set in place enclosed on the valve cap 2. In fact, as can be seen in Figure 3, the cover 3 can only be removed by destroying either the connection between the bolts 312 and the dome-shaped material around the openings 314, by
5 destroying the foil hinge 300, or by destroying any other portion of the material of the cover 3. In other words, the cover 3 cannot be removed without being destroyed.

Accordingly, the cover 3 serves as a tamper-proof member in the sense that a user can take from the condition of the cover 3 whether it has been tampered with the gas cylinder or whether it is in
10 its intended state.

The two half-shells 30, 32 include, in their bottom portion, a collar 320, wherein this collar 320 is intended to be inserted below the lower portion of the valve cap 2 of the gas cylinder 1 when the cover 3 is in its intended, closed state. The position of the collar 320 of the cover 3 in the closed
15 state of the cover 3 is schematically shown in Figure 1.

The collar portions 320 combine to a full collar once the two half-shells 30, 32 are folded upon one another. This can be clearly seen in Figure 3, in which the bottom portion of the cover 3 including the collar 320 is situated in the upper portion of the Figure. In fact, the opening 322 which remains
20 at the inner diameter of the collar 320 is intended to receive the valve unit but is intended to have a diameter smaller than the lower diameter of the valve cap 2 of the gas cylinder 1.

The top portion of the cover 3 is intended to close the cavity which is formed when the two half-shells 30, 32 are folded upon one another. To this end, an upper portion 330 of the cover 3 is
25 provided in the second half-shell 32, which is intended to cooperate with a protrusion 332 in the first half-shell 30 in order to close the cover 3 when the two half-shells 30, 32 are folded upon one another. The protrusion 332 is intended to be slid below the upper portion 330 of the cover 3 once the first and second half-shells are folded upon one another.

30 The inner cavities 340 and 342 of the respective half-shells 30 and 32 are preferably shaped such that they closely resemble the outer contours of the valve cap 2 of the gas cylinder 1. By this measure, not only an efficient way of transporting the gas cylinder 1 can be achieved but also a higher degree of resistance of the cover can be achieved.

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Claims

1. Cover (3) for a valve cap (2) of a gas cylinder (1), wherein the cover (3) includes a cavity (340, 342) which is dimensioned to receive at least a portion of the valve cap (2) of the gas cylinder (1),

characterized in that

the cover (3) is made from a substantially rigid material.

2. Cover (3) according to claim 1, wherein the cover (3) is made from a thermoformable material, preferably a thermoformable plastics material, preferably made from PET (Polyethylene Terephthalate), PVC (Polyvinyl Chloride), PCTFE (Polychlorotrifluoro Ethylene) laminated to PVC, COC (Cyclic Olefin Copolymers), COP (Cyclic Olefin Polymers), preferably in multilayered combinations with PP (Polypropylene), PE (Polyethylene), or PETg (glycol-modified Polyethylene Terephthalate) or the cover (3) is injection molded.
3. Cover (3) according to claim 1 or 2, wherein the cover (3) is provided in the form of a blister pack and/or a clamshell pack.
4. Cover (3) according to any one of the preceding claims, wherein the cover includes a tamper-proof connecting mechanism (310, 312, 314, 316), preferably in form of a frangible connecting arrangement, more preferably in the form of a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band.
5. Cover (3) according to any one of the preceding claims, comprising two half-shells (30, 32) which form the cavity (340, 342) for receiving portions of the valve cap (2) when folded upon themselves.
6. Cover (3) according to claim 5, wherein the two half-shells (30, 32) are interconnectible by means of at least one tamper-proof connector (310, 312, 314, 316) to form a tamper-proof cover.

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7. Cover (3) according to claim 5 or 6, wherein the two half-shells (30, 32) are connected via a foil hinge (300) and/or a tongue.
- 5 8. Cover (3) according to any one of claims 1 to 4, comprising more than two parts which form the cavity when connected.
- 10 9. Cover (3) according to claim 8, wherein at least two parts are interconnectible by means of at least one tamper-proof connector, preferably in the form of a clip, a thermal welding, an agrafe, a cramp, a staple, a plastic collar and/or an adhesive band, to form a tamper-proof cover and/or wherein at least two parts are connected via a foil hinge (300) and/or a tongue.
- 15 10. Cover (3) according to any one of the preceding claims, wherein the cavity is formed such that it fully surrounds the valve cap (2) of the gas cylinder (1) when applied to the valve cap (2).
- 20 11. Cover (3) according to any one of the preceding claims, wherein the cover (3) is made in one piece, preferably by thermoforming a thermoformable plastics sheet or by injection molding.
12. Cover (3) according to any one of the preceding claims, wherein a handle portion (32) of the cavity, resembling a handle portion (24) of the valve cap (2), is formed in the cover (3).
- 25 13. Cover (3) according to any one of the preceding claims, wherein a collar (320) is formed in the cover (3) which is intended to be arranged at a bottom portion of the valve cap (2).
14. Cover (3) according to claim 13, wherein the collar (320) defines an opening (322) having a diameter smaller than the largest diameter of the valve cap (2).
- 30 15. Cover (3) according to any one of the preceding claims, wherein the cover is formed to hermetically seal off the valve cap (2) of the gas cylinder (1) when being applied to the valve cap (2).

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16. Cover (3) according to any one of the preceding claims, wherein openings for receiving a hook or any other fastening means situated at the valve cap of the gas cylinder are provided.

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Abstract

The present invention pertains to a cover (3) for a valve cap (2) of a gas cylinder (1), wherein the cover (3) includes a cavity (340, 342) which is dimensioned to receive portions of the valve cap (2)
5 of the gas cylinder (1), wherein the cover (3) is made from a substantially rigid material.

(Figure 1)

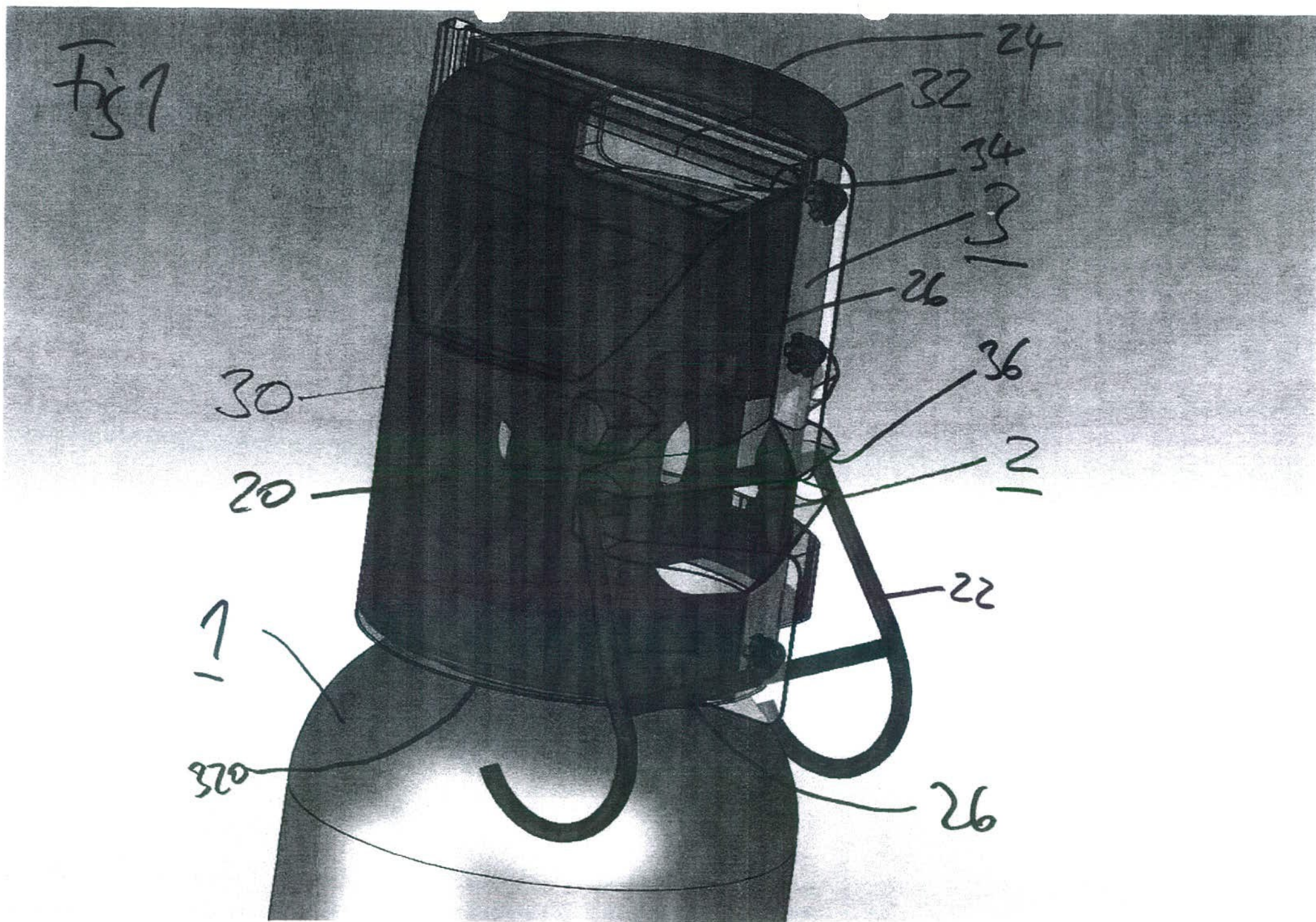


Fig 3

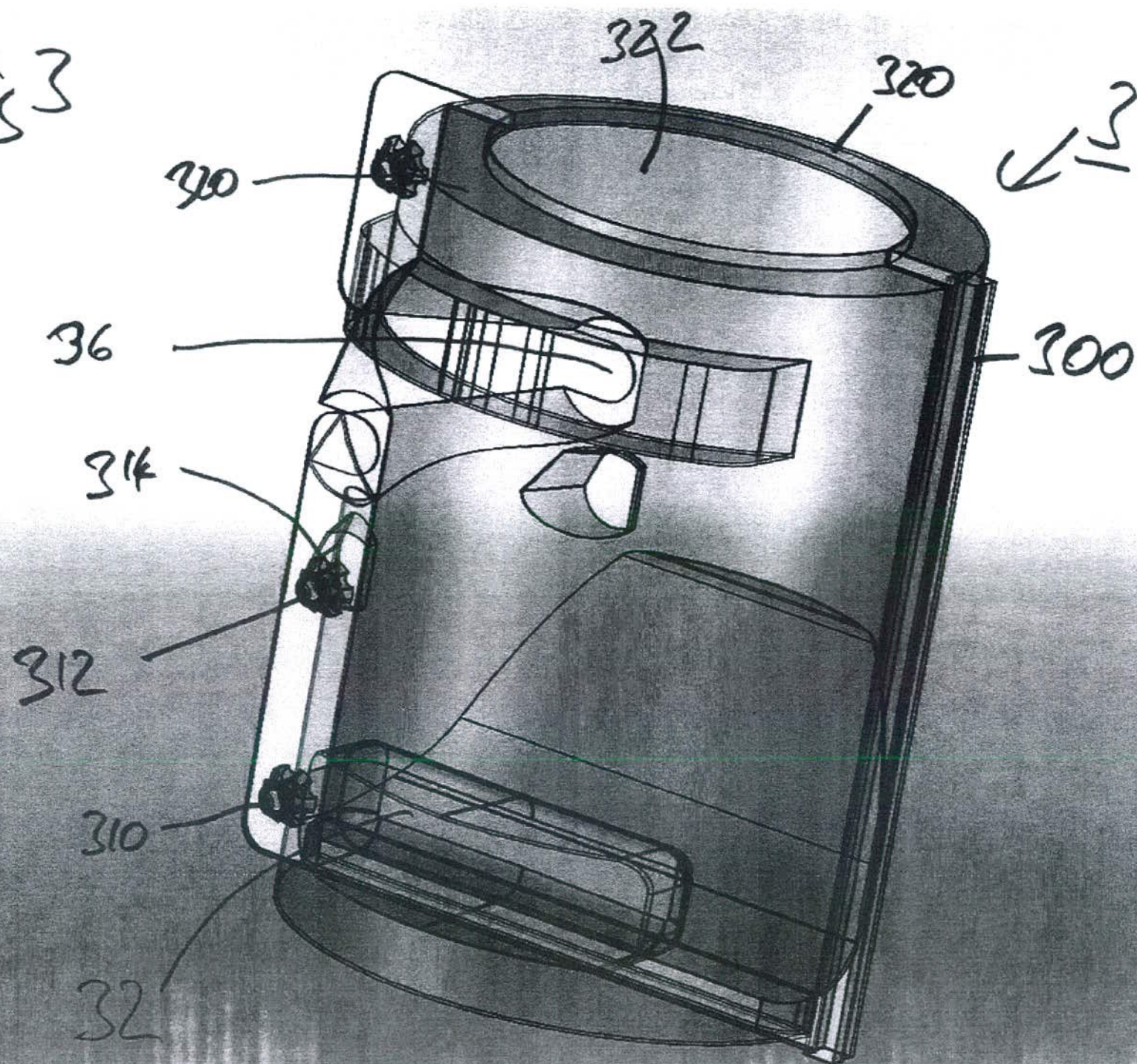
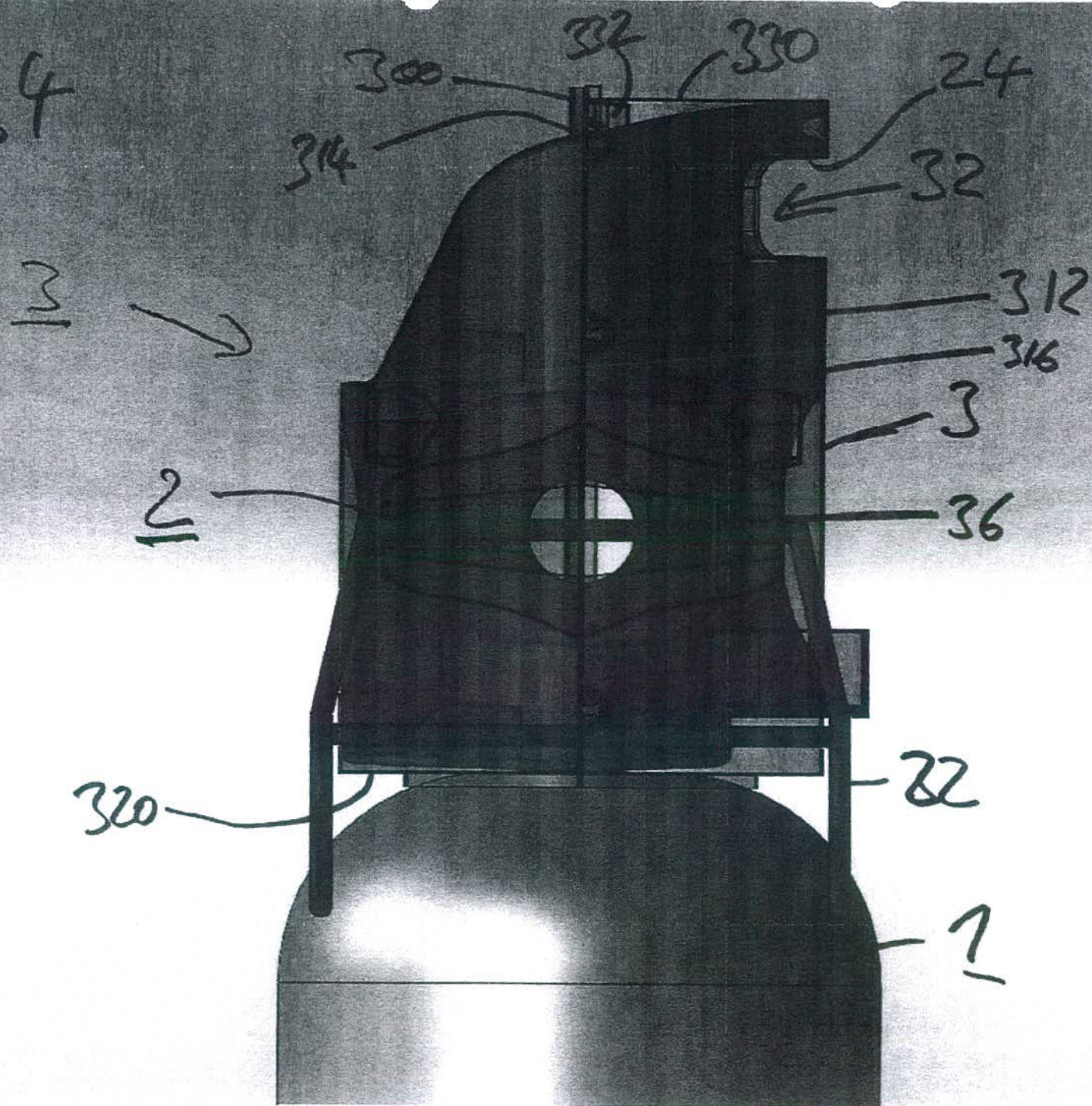


Fig 4



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POWER OF ATTORNEY / CARTA – PODER

The undersigned (NAME) Rainer Kasseckert
El abajofirmante (NOMBRE)
in the name and on behalf of (COMPANY) LINDE AG
en nombre y representación de (EMPRESA)
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social object and organized under the laws of Germany / Alemania
una compañía existente, que cumple su objeto
social y organizada bajo las leyes de
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con domicilio en (DOMICILIO)

without revoking previous Powers of Attorney, hereby grants to Ernesto Cavelier, TPA 11.519; Helena Camargo Williamson, TPA 76985; Jaime Herrera Rodriguez; TPA No. 71.661; Daniel Posse Velasquez, TPA No. 42.529; Mariana Posse Velasquez, TPA No. 35.752; Juan Guillermo Ruiz Hurtado, TPA No. 40.066; Francisco Urrutia Montoya, TPA No. 27.321; José Alejandro Torres Hernández, TPA No. 75.372; Alvaro José Rodriguez, TPA No. 79.711, domiciled at Cra. 7 No. 71-52 Torre A Of. 504 of Bogota D.C., Colombia a full and sufficient power of attorney to act before the proper Offices and Authorities for all matters relating to the patent related to International Application No. PCT/EP2012/071129 filed on October 25, 2012 (International Publication Number WO 2013/060765), entitled: "COVER FOR A VALVE CAP OF A GAS CYLINDER" which claims priority of Patent Application EP 11186984.8 (filed on 27 October 2011) and maintaining and protecting the same, to which end they may file petitions, make declarations, including declarations of use, pay taxes, prove working and use, bespeak certified copies and receive documents; file and ratify oppositions; submit and produce evidence; appeal; accept transfers and assignments, including assignments of priority rights; request approval and registration of transfer of patents, mergers and changes of name; file amendments, settlements, waivers and consents; withdraw and collect, giving them all such further powers as may be required for the objects stated so as to protect all our Industrial and Intellectual Property rights and interests, including authority to substitute this power and revoke such substitutions, for the territory of Colombia, and we hereby declare as good and valid all that our said attorneys may have done for any of the purposes stated.

sin revocar poderes anteriores, por el presente otorga a Ernesto Cavelier, TPA 11.519; Helena Camargo Williamson, TPA 76985; Jaime Herrera Rodriguez; TPA No. 71.661; Daniel Posse Velasquez, TPA No. 42.529; Mariana Posse Velasquez, TPA No. 35.752; Juan Guillermo Ruiz Hurtado, TPA No. 40.066; Francisco Urrutia Montoya, TPA No. 27.321; José Alejandro Torres Hernández, TPA No. 75.372; Alvaro José Rodriguez, TPA No. 79.711, domiciliados en Cra. 7 No. 71-52 Torre A Of. 504 of Bogota D.C., Colombia poder especial amplio y suficiente para que conjunta o separadamente lo represente ante las entidades, autoridades y personas que correspondan, para todo lo relacionado con la patente correspondiente a la Solicitud Internacional No. PCT/EP2012/071129 presentada el 25 de octubre de 2012 (No. de Publicación Internacional WO 2013/060765), titulada: "COBERTURA PARA UNA TAPA DE VÁLVULA DE UN CILINDRO DE GAS" que reivindica prioridad de la Solicitud EP 11186984.8 (presentada el 27 de octubre de 2011) y para su defensa y mantenimiento, a cuyo efecto podrán elevar solicitudes, hacer declaraciones, inclusive declaraciones de uso, oblar impuestos, justificar explotaciones y uso, solicitar testimonios y recibir documentos; deducir y ratificar oposiciones; ofrecer y producir pruebas; apelar; aceptar transferencias y cesiones, incluyendo cesiones de derechos de prioridad; solicitar la aprobación e inscripción de contratos de transferencia de patentes, inscripción de fusiones y cambios de nombre; enmendar, transar, renunciar, autorizar, desistir y percibir, dándoles en fin todas las facultades necesarias a los objetos indicados para el resguardo de todos nuestros intereses y derechos de Propiedad Industrial e Intelectual, inclusive la de sustituir el presente y revocar tales sustituciones, para el territorio de Colombia, quedando expresamente ratificadas por el presente cualesquiera gestiones anteriormente realizadas por dichos apoderados a los efectos indicados.

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at / en (PLACE) Pullach
SIGNATURE Rainer Kasseckert
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CANT. RENTISTICO	CONCEPTO	Vr.UNDITARIO	Vr.CONCEPTO
1 50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE INVENCIÓN	515.000.00	515.000.00
			\$515.000.00

SON: **QUINIENTOSQUINCE MIL PESOS MONEDA CORRIENTE**

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CANT.	RENTISTICO	CONCEPTO	Vr. UNIDITARIO	Vr. CONCEPTO
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				\$186.000.00

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