(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 643 167 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
25.02.2015 Bulletin 2015/09

(21) Application number: **11801826.6**

(22) Date of filing: **21.11.2011**

(51) Int Cl.:
B44D 3/12 *(2006.01)* ***B65D 43/00*** *(2006.01)*

(86) International application number:
PCT/IB2011/002760

(87) International publication number:
WO 2012/069904 (31.05.2012 Gazette 2012/22)

(54) LID FOR A CONTAINER FOR FLUID COLORING PRODUCTS

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COUVERCLE POUR UN CONTENANT DESTINÉ À DES PRODUITS COLORANTS FLUIDES

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **22.11.2010 IT UD20100211**

(43) Date of publication of application:
02.10.2013 Bulletin 2013/40

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EP 2 643 167 B1

Printed by Jouve, 75001 PARIS (FR)

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a lid for a container for fluid coloring products, such as for example coloring liquids, bases for paints, varnishes, enamels, inks or other fluid coloring substances. The lid comprises an elastic and impermeable membrane, which can be perforated by one or more delivery needles through which, into the container, coloring pigments can be introduced without needing to first remove the lid from the container. The elastic membrane automatically re-closes, becoming impermeable again, when each delivery needle is removed.

BACKGROUND OF THE INVENTION

[0002] A lid is known, for example from GB-A-2175282, for a container for fluid coloring products, for example a base for paint, which is provided with an elastic and impermeable membrane, shaped like a disc, made of elastomer material, about 2 mm thick, and able to be perforated by one or more metal needles. Each needle is able to deliver a dosed quantity of coloring pigments inside the container to obtain the desired coloring product. The elasticity of the material the membrane is made of allows the holes, made temporarily by the insertion of each needle, to re-close automatically when the needle is removed, restoring its original impermeability to the membrane.

[0003] The known lid comprises an annular support made of plastic material provided with a circular internal shoulder, U-shaped to define a circumferential cavity in which the peripheral part of the membrane is disposed. A clamping ring nut, also annular, is fixed inside the annular support and keeps the peripheral part of the membrane clamped inside the circumferential cavity of the annular support.

[0004] Furthermore, the clamping ring nut is provided, in its upper surface, with an annular groove with which it is able to cooperate with a corresponding annular ridge, protruding toward the bottom from the body of the annular support. The coupling of the annular ridge with the annular groove allows the known lid to be stacked on top of another similar lid.

[0005] The known lid, however, has the disadvantage of having the stacking elements made on two distinct pieces. In fact, the lower ridge is made on the annular support, whereas the corresponding upper groove is made on the ring nut, and it is therefore necessary to adequately prepare both the molds to make the two pieces and require a greater accuracy in the tolerances of the two pieces which must match properly.

[0006] Another disadvantage of the known lid concerns the clamping of the membrane on the support element. In fact, the membrane must be provided with a reinforcement edge, perpendicular to its operating surface and facing toward the bottom, which is inserted into the circumferential cavity of the support element. This also implies an increase in production costs of the lid in its entirety.

[0007] A second lid is also known, similar to the one described above, in which the support element is laterally provided with a circumferential tooth, or undercut, able to cooperate permanently and irremovably with the internal wall of the container, or with a hole made in the upper part of the container. Furthermore, in the lower part of the support element there is a deep circumferential groove, which can certainly function as a stacking element, but inside which a certain quantity of product contained in the container may be deposited, disadvantageously, thus compromising the final result of the homogenization of the base and the colorant.

[0008] Another disadvantage of the second known lid is the presence of the circumferential tooth, which makes the lid, once coupled with the container, unable to be removed without being damaged.

[0009] One purpose of the present invention is to achieve a lid for a container for fluid coloring products which is simpler and cheaper to make and which allows easy stacking with other identical lids.

[0010] Another purpose of the present invention is to achieve a lid which is also applicable to the relative container and can be removed from it simply, even by the final user.

[0011] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0012] The present invention is set forth and characterized in the independent claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0013] In accordance with the above purposes, a lid for a container for fluid coloring products according to the present invention comprises a support element, substantially annular in shape and provided with an internal shoulder, on which the peripheral part of an impermeable and elastic membrane rests, and a clamping element, for example an annular ring nut, disposed inside the support element to keep the membrane clamped against the internal shoulder.

[0014] According to one characteristic of the present invention, the support element is provided in its upper part with an annular groove, and comprises in its lower part a corresponding annular protuberance aligned with the annular groove. In this way, in the same support element both the elements are present which allow several lids to be easily stacked one on top of the other.

[0015] According to a secondary characteristic of the present invention, anchoring means are provided to keep the membrane in a desired position with respect to a rest-

ing plane of the internal shoulder of the support element. The anchoring means comprise teeth and/or pegs, made on the support element and/or the clamping element, and able to cooperate with the membrane.

[0016] Furthermore, to keep the membrane constantly on a determinate work plane, both during the holing operations by the needles and also during the removal of the needles, the support element and the clamping element are both provided with one or more annular ribs, preferably concentric with each other, and a plurality of radial ribs.

[0017] According to another secondary characteristic of the present invention, at least the ribs, both annular and radial, of the support element are pointed toward the bottom, to prevent the formation of lumps of coloring product contained in the container.

[0018] According to another secondary characteristic of the present invention, the support element comprises an external wall, substantially cylindrical and perpendicular to the resting plane of the internal shoulder, which is able to couple with a corresponding internal wall of the container on which the lid is mounted.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a plan view of a lid for a container for fluid coloring products according to the present invention;
- fig. 2 is a section from II to II in fig. 1;
- fig. 3 is an enlargement of the detail III in fig. 2, limited to the lid;
- fig. 4 is a first variant of the lid in fig. 1;
- fig. 5 is a second variant of the lid in fig. 1
- fig. 6 shows schematically a plurality of lids according to the present invention, identical to the one in fig. 1, stacked on top of each other.

[0020] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one form of embodiment can conveniently be incorporated into other forms of embodiment without further clarifications.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF

EMBODIMENT

[0021] With reference to figs. 1, 2 and 3, a lid 10 for a container 11 for fluid coloring products, according to the present invention, comprises a support element 12, for example made of plastic material, annular in shape, which is shaped for example by molding so as to have an internal cavity 13, an external wall 15, substantially cylindrical in shape, or slightly flared, smooth and therefore without undercuts, and an internal shoulder 16, having a resting plane 17 substantially perpendicular to the external wall 15. The latter is able to couple, for example through interference, with an internal wall 19 (fig. 2), also cylindrical, of the container 11. The latter can be of any known type, such as for example of the type described in the Italian patent application for industrial invention n. UD2010A000126, which Applicant filed on 24.06.2010.

[0022] To facilitate the coupling between the lid 10 and the container 11, the lower part of the wall 15 is slightly flared toward the bottom, for example by a few degrees (from 5° to 10°), and is connected to the lower surface of the support element 12.

[0023] The support element 12 is also provided with an upper peripheral edge 20 (fig. 3), substantially perpendicular to the external wall 15 and which defines the external diameter of the lid 10. The lower surface of the upper peripheral edge 20 may also advantageously function as an abutment surface to rest a tool on, such as for example a screwdriver, if it were desired to remove the lid 10 from the container 11.

[0024] The lower surface of the peripheral edge of a membrane 22 is rested on the resting plane 17; the membrane 22 is impermeable, elastic, disc-shaped and with a thickness of about 2-3 mm. The material the membrane 22 is made of is a known type, for example an elastomer easily holed by one or more needles, for example metal, each having a diameter of about 4 mm. The membrane 22 has elastic properties such as to allow the holes made by the needles to automatically re-close when the latter are removed, and thus return to its condition of impermeability both in a static situation, for example during storage in a warehouse, and also in a dynamic situation, for example during the mixing of the fluid coloring products contained inside the container 11 when, for example, the lid 10, already holed, has to resist to cycles with a sinusoidal form and with frequencies from 50 to 1000 rpm and with differences of 40 to 60 mm.

[0025] A clamping ring nut 23 is disposed in the internal cavity 13 of the support element 12 and is fixed to it by means of a circumferential tooth 25 inserted, for example in snap-in fashion, into a corresponding annular compartment 26, with a V-shaped cross section, of the support element 12. The clamping ring nut 23 holds the membrane 22 constantly in the desired position, pressing the peripheral edge of the latter against the internal shoulder 16.

[0026] Furthermore, attachment means may be provided to keep the membrane 22 in the desired position with respect to the support element 12. The attachment means, in a preferential form of embodiment shown in fig. 3, comprise an adequate number (for example a dozen) of pointed teeth 24, distributed along the lower surface of the clamping ring nut 23 and/or the resting plane 17 and facing toward the membrane 22, to penetrate in-

side it.

[0027] According to a variant, shown in fig. 4, instead of the pointed teeth 24 or in addition to them, the internal shoulder 16 of the support element 12 is provided with a series of pegs 27 facing toward the top and inserted into corresponding holes 28 made on the upper part of the peripheral edge of the membrane 22. Preferably, the pegs 27, and consequently the corresponding holes 28, are angularly equidistant from each other, and their number is comprised between four and twelve.

[0028] According to another variant, shown in fig. 5, the pegs 27 are made on the clamping ring nut 23 instead of on the support element 12, and face toward the bottom to be inserted in any case into the corresponding holes 28 of the membrane 22.

[0029] To render the lid 10 stackable easily and safely with other identical lids 10, the support element 12 is provided in the upper part with an annular groove 29 and, in the lower part, with a corresponding annular protuberance 30 (figs. 2, 3 and 4), having a width substantially equal to the width of the annular groove 29. By width, we mean the size of the cross section.

[0030] The annular protuberance 30 has its lateral sides slightly flared toward the bottom (for example from 5° to 15°), to facilitate its insertion into a corresponding annular groove 29 of another lid 10, when the lids 10 are stacked one on top of the other (fig. 6).

[0031] The annular groove 29 is very deep, in the range of about 9 mm, so that the thickness of the support element 12 is substantially uniform, thus facilitating the molding thereof.

[0032] Furthermore, to keep the membrane 22 substantially flat along its whole surface, also during the operations of inserting and removing the needles, the support element 12 is provided with two annular ribs 31, concentric to the internal cavity 13, and with five radial ribs 32, angularly offset by 72° one with respect to the other. Similarly, the clamping ring nut 23 is provided with two annular ribs 33, overlapping the annular ribs 31, and with five radial ribs 35, angularly equidistant from each other but offset by 36° with respect to the radial ribs 32 below.

[0033] The annular ribs 33 and the radial ribs 35 are all pointed toward the top, to prevent the delivery needles from jamming on them when they are lowered toward the membrane 22 to perforate it, and also to guide them. The angle at the vertex of the annular ribs 33 and the radial ribs 35 is about 35°.

[0034] The annular ribs 31 and the radial ribs 32 are instead all pointed toward the bottom, so that the fluid material contained inside the container 11 does not adhere to the walls of the ribs, and hence does not form lumps when it dries, lumps which could impede the proper functioning of the needles. The angle at the vertex of the annular ribs 31 and the radial ribs 32 is comprised between about 25° and about 30°.

[0035] The lid 10 may also optionally comprise an upper layer 40, consisting of a film or a disc, made of plastic material or metal, for example aluminum, very thin, with a thickness of some tenths of a millimeter, for example of the type described in the Italian patent for industrial invention n. 1370076, granted to Applicant on 26.01.2010. The upper layer 40 is attached to the upper part of the ring nut 23 and functions as an element to recognize the perforation, with the property of indicating, clearly and visibly, if the lid 10 has been perforated or is still whole.

[0036] The upper layer 40 may also be personalized by the producer or the client, for example with the insertion of messages on the use of the distribution system, or by affixing the trade mark of the product or other information.

[0037] It is therefore clear that the lid 10 as described heretofore is simple to make and that the support element 12 on which the membrane 22 rests is also provided with means that allow to stack the lid, consisting in this case of the annular groove 29 and the corresponding annular protuberance 30.

Claims

1. Lid for a container for fluid coloring products, comprising a support element (12), substantially annular in shape and provided with an internal shoulder (16) on which the peripheral part of an impermeable and elastic membrane (22) rests, and a clamping element (23) disposed inside said support element (12) in order to keep said membrane (22) clamped against said internal shoulder (16), **characterized in that** said support element (12) is provided in its upper part with an annular groove (29) and in its lower part comprises a corresponding annular protuberance (30) aligned with said annular groove (29).

2. Lid as in claim 1, **characterized in that** said internal shoulder (16) of said support element (12) comprises a resting plane (17) on which the lower surface of the peripheral part of said membrane (22) rests, and **in that** anchoring means (24, 27, 28) are provided to keep said membrane (22) in a desired position with respect to said resting plane (17).

3. Lid as in claim 2, **characterized in that** said anchoring means comprise a plurality of pointed teeth (24), distributed along the lower surface of said clamping element (23) and/or of said resting plane (17) and facing toward said membrane (22), in order to penetrate inside the latter.

4. Lid as in claim 2, **characterized in that** said anchoring means comprise a plurality of pegs (27) protruding toward the top from said internal shoulder (16) and inserted in corresponding holes (28) made in the peripheral edge of said membrane (22).

5. Lid as in claim 2, **characterized in that** said anchor-

ing means comprise a plurality of pegs (27) protruding toward the bottom from the lower surface of said clamping element (23) and inserted in corresponding holes (28) made in the peripheral edge of said membrane (22).

6. Lid as in any claim hereinbefore, **characterized in that** both said support element (12) and said clamping element (23) are provided with one or more annular ribs (31), concentric with respect to each other, and with a plurality of radial ribs (32), and **in that** at least said ribs, both annular (31) and radial (32), of said support element (12) are pointed toward the bottom.

7. Lid as in claim 6, **characterized in that** the angle at the vertex of said ribs (31 and 32) is comprised between about 25° and about 30°.

8. Lid as in any claim hereinbefore, **characterized in that** said support element (12) comprises an external wall (15), substantially cylindrical and perpendicular to said internal shoulder (16), which is able to couple with a corresponding internal wall (19) of said container (11).

9. Lid as in claim 8, **characterized in that** the lower part of said external wall (15) is slightly flared toward the bottom and is connected to the lower surface of said support element (12).

10. Lid as in claim 8 or 9, **characterized in that** said support element (12) also comprises an upper peripheral edge (20), substantially perpendicular to said external wall (15).

Patentansprüche

1. Deckel für einen Behälter für flüssige Färbeprodukte, aufweisend ein im Wesentlichen ringförmig ausgeformtes Stützelement (12), welches mit einer Innenschulter (16) ausgestattet ist, auf welcher der periphere Teil einer undurchlässigen und elastischen Membran (22) aufliegt, und ein Klemmelement (23), welches in dem Stützelement (12) angeordnet ist, um die Membran (22) gegen die Innenschulter (16) geklemmt zu halten, **dadurch gekennzeichnet, dass** das Stützelement (12) in seinem oberen Abschnitt mit einer Ringnut (29) ausgestattet ist und in seinem unteren Abschnitt eine zugehörige Ausstülpung (30) aufweist, welche zu der Ringnut (29) ausgerichtet ist.

2. Deckel gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Innenschulter (16) des Stützelements (12) eine Auflageebene (17) aufweist, auf welcher die untere Fläche des peripheren Teils der Membran (22) aufliegt, und dadurch, dass Verankerungsmittel (24, 27, 28) bereitgestellt sind, um die Membran (22) in einer gewünschten Position relativ zur Auflageebene (17) zu halten.

3. Deckel gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Verankerungsmittel eine Mehrzahl an spitzen Zähnen (24) aufweisen, welche entlang der unteren Fläche des Klemmelements (23) und/oder der Auflageebene (17) verteilt sind und der Membran (22) zugewandt sind, um in diese einzudringen.

4. Deckel gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Verankerungsmittel eine Mehrzahl von Zapfen (27) aufweisen, welche zur Oberseite hin von der Innenschulter (16) hervorragen und in zugehörige Öffnungen (28) eingeführt sind, welche in dem peripheren Rand der Membran ausgebildet sind.

5. Deckel gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Verankerungsmittel eine Mehrzahl von Zapfen (27) aufweisen, welche zur Unterseite hin von der unteren Fläche des Klemmelements (23) hervorragen und in zugehörige Öffnungen (28) eingeführt sind, welche in dem peripheren Rand der Membran (22) ausgebildet sind.

6. Deckel gemäß irgendeinem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** sowohl das Stützelement (12) als auch das Klemmelement (23) mit einer oder mehreren zueinander konzentrischen Ringrippen (31) und einer Mehrzahl von Radialrippen (32) ausgestattet sind, und dadurch, dass zumindest die Rippen, sowohl die Ringrippen (31) als auch die Radialrippen (32), des Stützelements (12) zur Unterseite hin zugespitzt sind.

7. Deckel gemäß Anspruch 6, **dadurch gekennzeichnet, dass** der Winkel am Scheitel der Rippen (31 und 32) zwischen ungefähr 25° und ungefähr 30° beträgt.

8. Deckel gemäß irgendeinem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Stützelement (12) eine Außenwand (15) aufweist, welche im Wesentlichen zylindrisch und senkrecht zur Innenschulter (16) ist, und welche mit einer zugehörigen Innenwand (19) des Behälters (11) kuppelbar ist.

9. Deckel gemäß Anspruch 8, **dadurch gekennzeichnet, dass** der untere Teil der Außenwand (15) zur Unterseite hin geringfügig konisch erweitert ist und mit der unteren Fläche des Stützelements (12) verbunden ist.

10. Deckel gemäß Anspruch 8 oder 9, **gekennzeichnet dadurch, dass** das Stützelement (12) weiter einen

oberen peripheren Rand (20) aufweist, welcher im Wesentlichen senkrecht zu der Außenwand (15) ist.

Revendications

1. Couvercle pour un contenant destiné à des produits colorants fluides, comprenant un élément de support (12), de forme sensiblement annulaire et pourvu d'un épaulement interne (16) sur lequel la partie périphérique d'une membrane imperméable et élastique (22) repose, et un élément de bridage (23) disposé à l'intérieur dudit élément de support (12) afin de garder ladite membrane (22) bridée contre ledit épaulement interne (16), **caractérisé en ce que** ledit élément de support (12) est pourvu dans sa partie supérieure d'une rainure annulaire (29) et dans sa partie inférieure comprend une protubérance annulaire correspondante (30) alignée avec ladite rainure annulaire (29).

2. Couvercle selon la revendication 1, **caractérisé en ce que** ledit épaulement interne (16) dudit élément de support (12) comprend un plan de repos (17) sur lequel la surface inférieure de la partie périphérique de ladite membrane (22) repose, et **en ce que** des moyens d'ancrage (24, 27, 28) sont prévus pour garder ladite membrane (22) dans une position souhaitée par rapport audit plan de repos (17).

3. Couvercle selon la revendication 2, **caractérisé en ce que** lesdits moyens d'ancrage comprennent une pluralité de dents acérées (24), réparties le long de la surface inférieure dudit élément de bridage (23) et/ou dudit plan de repos (17) et en regard vers ladite membrane (22), afin de pénétrer à l'intérieur de cette dernière.

4. Couvercle selon la revendication 2, **caractérisé en ce que** lesdits moyens d'ancrage comprennent une pluralité de chevilles (27) faisant saillie vers le sommet depuis ledit épaulement interne (16) et insérées dans des trous correspondants (28) réalisés dans le bord périphérique de ladite membrane (22).

5. Couvercle selon la revendication 2, **caractérisé en ce que** lesdits moyens d'ancrage comprennent une pluralité de chevilles (27) faisant saillie vers le fond depuis la surface inférieure dudit élément de bridage (23) et insérées dans des trous correspondants (28) réalisés dans le bord périphérique de ladite membrane (22).

6. Couvercle selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit élément de support (12) et ledit élément de bridage (23) sont tous deux pourvus d'une ou plusieurs rainures annulaires (31), concentriques les unes avec les autres, et d'une pluralité de nervures radiales (32), et **en ce que** lesdites nervures, à la fois annulaires (31) et radiales (32), dudit élément de support (12) pointent en direction du fond.

7. Couvercle selon la revendication 6, **caractérisé en ce que** l'angle au sommet desdites nervures (31 et 32) est compris entre environ 25° et environ 30°.

8. Couvercle selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit élément de support (12) comprend une paroi externe (15), sensiblement cylindrique et perpendiculaire audit épaulement interne (16), qui est capable de se coupler avec une paroi interne correspondante (19) dudit contenant (11).

9. Couvercle selon la revendication 8, **caractérisé en ce que** la partie inférieure de ladite paroi externe (15) est légèrement évasée vers le fond et est raccordée à la surface inférieure dudit élément de support (12).

10. Couvercle selon la revendication 8 ou 9, **caractérisé en ce que** ledit élément de support (12) comprend également un bord périphérique supérieur (20), sensiblement perpendiculaire à ladite paroi externe (15).

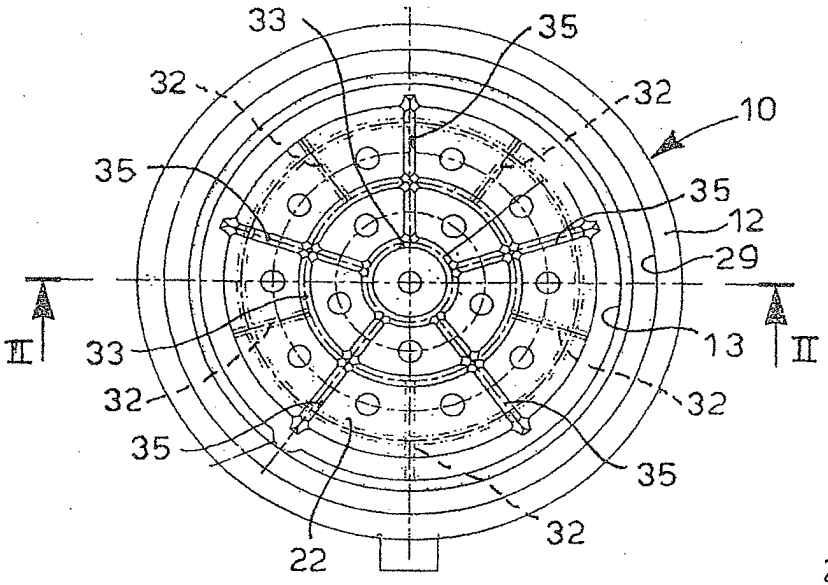

fig. 1

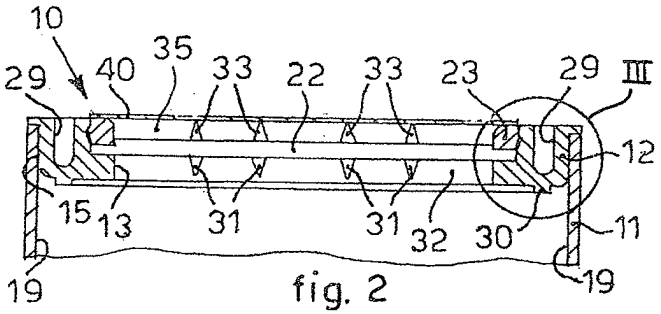

fig. 2

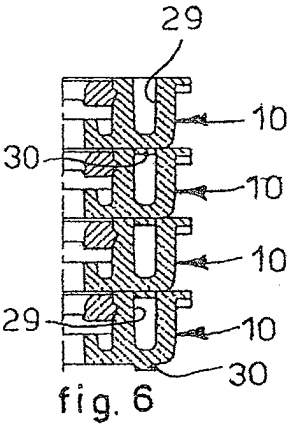

fig. 6

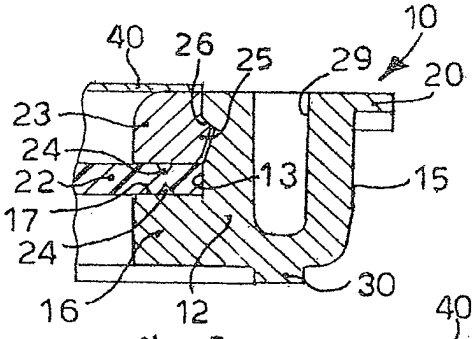

fig. 3

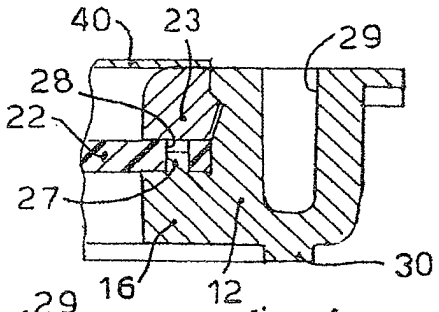

fig. 4

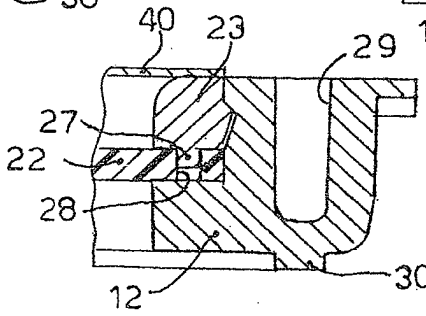

fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- IT UD20100126 A **[0021]**
- IT 1370076 **[0035]**