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(54) **PRESSURE ELEMENT FOR A LIQUID CONTAINER**

DRUCKELEMENT FÜR FLÜSSIGKEITSBEHÄLTER

ELEMENT PRESSEUR POUR CONTENANT DE LIQUIDE

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(56) References cited:
EP-A1- 0 167 482
WO-A1-2006/068586
WO-A2-01/42090
BE-A- 539 623

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Description

Technical field of the invention

[0001] The present invention relates to a pressure element intended to be used in a liquid container comprising a rigid outer shell, a bag which is disposed inside the outer shell, wherein said bag is made of flexible material impermeable to liquid and has an aperture, a discharge means which is connected to the aperture and which when the liquid container is in the position of use passes through the upper half of the shell, and a pressure element which is disposed in the shell, exerts pressure on the liquid in the bag and is placed between the bottom of the outer shell and the bottom of the bag.

State of the art

[0002] A liquid container of the kind indicated above is previously known from PCT/SE2005/001932, but in that case the pressure element, normally in the form of a compression spring, exerts a permanent pressure on the liquid contained in the bag made of flexible material. This results in disadvantages, e.g. the connection between the bag and the discharge means is more likely to begin to leak if it is subject to liquid pressure for a long time. The permanent pressure exerted by the pressure element subjects the shell to stress which may even cause deformation of the shell. If the pressure element is in an active state, it is also difficult to effect rational handling when a liquid container of the kind indicated above is put in order.

[0003] WO 01/42090 discloses a pressure element in the form of a spring which can be retained in its compressed position by a latch attached to the shell.

Objects and features of the invention

[0004] A primary object of the present invention is to provide a pressure element of the kind indicated above whereby the user directly activates the pressure element when the liquid container is to be put to use.

[0005] A further object of the present invention is that activation of the pressure element should be effected in an easy and user-friendly manner.

[0006] Another object of the present invention is that the pressure element should be extremely compact in an unactivated state.

[0007] At least the primary object of the present invention is achieved by a pressure element that is provided with the features indicated in the independent claim set out below. Preferred embodiments of the invention are defined in the dependent claims.

Brief description of the drawings

[0008] A pressure element and an embodiment of a liquid container are described below with reference to the attached drawings, in which:

Fig. 1	depicts a perspective view of a pressure element according to the present invention, with the pressure element in an expanded state;
Fig. 2	depicts a section through the pressure element according to Fig. 1;
Fig. 3	depicts a section through the pressure element according to Fig. 1, but with the pressure element in a pressed-together state;
Fig. 4	depicts on a larger scale a detail which is circled in Fig. 3;
Fig. 5	depicts a plan view of a first plate forming part of the pressure element;
Fig. 6	depicts a section through A-A in Fig. 5;
Fig. 7	depicts on a larger scale a detail which is circled in Fig. 6;
Fig. 8	depicts a plan view of a second plate forming part of the pressure element;
Fig. 9	depicts a section through B-B in Fig. 8;

Fig. 10 depicts on a larger scale a detail which is circled in Fig. 9;

Fig. 11 depicts a perspective view of a pressed-together pressure element according to the present invention and a shell for a liquid container , but omitting the flaps which constitute the upper portion of the shell;

Fig. 12A-Fig. 12D depict schematically how a pressure element according to the present invention and a flexible bag for liquid are introduced into the shell of a liquid container;

Fig. 13 depicts a perspective view from beneath of a liquid container;

Fig. 14A-Fig. 14C depict the use of a liquid container;

Fig. 15 depicts a perspective view from beneath of a liquid container, said said liquid container being equipped with a first embodiment of indicating means;

Fig. 16 depicts a perspective view from beneath of a liquid container , said liquid container being equipped with a second embodiment of indicating means;

Fig. 17 depicts a perspective view of a pressure element in expanded state, said pressure element being equipped with a measuring band;

Fig. 18 depicts a perspective view of the pressure element according to Fig. 17 where a roller for the measuring band is visible;

Fig. 19 depicts a side view of a pressure element according to Fig. 17, the pressure element being in a pressed-together state;

Fig. 20 depicts a side view of a pressure element according to Fig. 17, the pressure element being in an expanded state; and

Fig. 21 depicts a perspective view from beneath of a liquid container, the shell of said liquid container being equipped with a display for the measuring band.

Detailed description of a preferred embodiment of the invention

[0009] The pressure element 6 depicted in Figs. 1-4, which constitutes the very core of the present invention, comprises a plate 1 which in the position of use is an upper plate, two compression springs 2 in the form of coil springs, and a plate 3 which in the position of use is a lower plate. The plates 1 and 3 are situated centrally to one another. Figs. 1 and 2 depict the pressure element 6 in an expanded state, Fig. 3 in a pressed-together state.

[0010] Figs. 5-7 depict the upper plate 1 comprising a first disc-shaped element 4 and two sets of first ribs 5. Each compression spring 2 cooperates with one set of first ribs 5. In the embodiment depicted, each set comprises seven first ribs 5 which have a certain extent perpendicular to the disc-shaped element 4. Each set of first.ribs 5 connects to a first central portion 7 which has a certain extent perpendicular to the first disc-shaped element 4. The first ribs 5 of each set extend like spokes from the first central portion 7. The first ribs 5 and the first central portion 7 are formed integrally with the first disc-shaped element 4. The first ribs 5 and the first central portion 7 provide general reinforcement for the first disc-shaped element 4. As may most clearly be seen in Fig. 7, each of the first central portions 7 is provided with a number of recesses 8 which extend axially, i.e. the recesses 8 have an extent perpendicular to the main plane of the upper plate 1. The number of recesses 8 corresponds to the number of second ribs 16 in each set, see below.

[0011] The upper plate 1 also comprises a first part 9 of a releasable locking means pertaining to each first central portion 7. The first part 9 of the locking means comprises a first hooklike means 10 and an activation means 11. In the embodiment depicted, the first hooklike means 10 is formed integrally with a flexible part of the central portion 7, and the activation means 11 is formed integrally with the first hooklike means 10. In the embodiment depicted, the activation means 11 takes the form of a lug which has an extent which is in principle parallel with the first disc-shaped element 4. The size of the lug 11 is such that the user will be able to insert a finger in the lug 11.

[0012] Figs. 8-10 depict the lower plate 3 comprising a second disc-shaped element 15 and two sets of second ribs 16. Each compression spring 2 cooperates with one set of second ribs 16. In the embodiment depicted, each set comprises five second ribs 16 which have a certain extent perpendicular to the second disc-shaped element 15. Each

set of second ribs 16 connects to a second central portion 17 which has a certain extent perpendicular to the second disc-shaped element 15. The second ribs 16 of each set extend like spokes from the second central portion 17. The second ribs 16 and the second central portion 17 are formed integrally with the second disc-shaped element 15. The second ribs 16 and the second central portion 17 provide general reinforcement for the second disc-shaped element 15.

[0013] The lower plate 3 also comprises a second part 18 of the releasable locking means pertaining to each second central portion 17. The second part 18 of the locking means takes the form of a second hooklike means 18. In the embodiment depicted, the second hooklike means 18 is formed integrally with the second central portion 17 but is generally relatively rigid, unlike the first hooklike means 10, which is fastened to a flexible part of the first central portion 7. The lower plate 3 also comprises two first apertures 19 situated on a longitudinal centreline of the lower plate 3 and at some distance from one another.

[0014] The construction and function of the pressure element 6 will now be described with reference to Figs. 1-4. As may be seen most clearly in Figs. 1 and 2, the pressure element 6 comprises, as already mentioned above, a plate 1 which in the position of use is an upper plate, two compression springs 2, and a plate 3 which in the position of use is a lower plate. Each of the compression springs 2 takes the form of a helicoidal wire. The diameter of the compression springs 2 is such that the wire turns situated at the respective ends encompass the free ends of the respective ribs 5 and 16. The free ends of the respective ribs 5 and 16 thus define the position of the compression springs 2 on the upper plate 1 and the lower plate 3. In this context it should be noted that the first and second central portions 7 and 17 are situated in the centre of the compression springs 2, resulting in no torque when the engagement means are activated. This makes it possible, for example, to save material in the plates 1, 3.

[0015] Changing the pressure element 6 from an expanded state, see Figs. 1 and 2, to a pressed-together state, see Fig. 3, is effected by the upper plate 1 and the lower plate 3 being moved towards one another, thereby compressing the compression springs 2. This movement thus takes place in a direction transverse to the main plane of the plates 1 and 3. When the movement of the upper plate 1 and the lower plate 3 towards one another has proceeded far enough, the first hooklike means 10 will come into engagement with the second hookline means 18, see Fig. 4. The first hooklike means 10 will thus only spring sideways when it passes the second hookline means 18 and will thereafter spring back so that the engagement depicted in Fig. 4 is established. This sideways resilience is made possible by the first hooklike means 10 being disposed on a flexible part of the first central portion 7. During the final phase of the pressing together, the second ribs 16 of the lower plate 3 will be accommodated in the recesses 8 of the first central portions 7 of the upper plate 1, see Fig. 4. The result is increased mutual stability between the plates 1 and 3 when they are in a pressed-together state.

[0016] As may be seen in Fig. 3, mutually adjacent wire turns of the compression springs 2 will pile up on one another in the height direction, but the height of the pressed-together pressure element 6 is relatively small. By way of non-limitative example it may be indicated that the height is normally 1.5-2 cm.

[0017] As may be seen in Fig. 3, an activation means 11 is accommodated in a relating first aperture 19 when the pressure element 6 is in a pressed-together state. The significance of this will be explained below.

[0018] Fig. 11 depicts the pressure element 6 according to the present invention and a shell 20 forming part of a liquid container. The shell 20 comprises two long sides 21 (only one of which is visible), two short sides 22 (only one of which is visible) and a bottom 23. The shell 20 normally comprises also flaps which constitute the upper portion of the shell 20, but these flaps have been omitted for the sake of clarity. As may be seen in Fig. 11, the bottom 23 of the shell 20 is provided with two second apertures 24, the significance of which will be explained below. These apertures 24 may be defined by the bottom 23 of the shell being provided with perforations corresponding to the contours of the second apertures 24, said second apertures 24 being created by removal of the portions of the bottom 23 which are encompassed by the perforations.

[0019] Figs. 12A-12D depict schematically how a pressed-together pressure element 6 according to the present invention is introduced into a shell 20 of a liquid container. This entails the pressure element 6 being inserted downwards into the shell 20, see Fig. 12B, until it rests against the bottom 23 of the shell 20. Thereafter a flexible bag 25 is inserted downwards into the shell 20, see Fig. 12C. At this stage, a discharge cock 26 is retracted in the bag 25. Fig. 12D shows the stage when the flexible bag 25 is fitted in the shell 20, with an upper portion 28, normally in the form of flaps, of the shell 20 symbolising the fact that the shell 20 constitutes an enclosed space in which the pressure element 6 and the flexible bag 25 are accommodated.

[0020] Fig. 13 shows the underside of the liquid container, with the activation means 11 of the pressure element 6 situated centrally to the second apertures 24 of the shell 20. This means that the user will now have access to the activation means 11. Moving the activation means 11 towards one another, e.g. by means of the thumb and forefinger, will result in cessation of the engagement between the first and second first hooklike means 10 and 18 and in the compression springs 2 moving the upper plate 1 upwards, a movement which generally takes place in a direction transverse to the main plane of the plates 1 and 3.

[0021] Figs. 14A-14C illustrates schematically the use of the liquid container when the pressure element 6 has been put into an active state. Here there is also in the shell 20 a third aperture 27 which may be formed by removal of a portion

encompassed by a perforation. A discharge cock 26 connected to the bag 25 has been caused to extend out through the third aperture 27. A glass 30 has been placed under the discharge cock 26 and in this context it should be noted that the liquid container and the glass 30 rest on the same support.

[0022] Fig. 14A depicts a situation in which the flexible bag 25 is in principle full. The pressure element 6 has expanded somewhat as compared with the pressed-together locked state. In Fig. 14B, about one-third of the content of the flexible bag 25 has been consumed, resulting in the pressure element 6 having expanded correspondingly. In Fig. 14C, a further portion of the content of the flexible bag 25 has been consumed, resulting in further expansion of the pressure element 6. The expansion of the pressure element 6 normally proceeds until in principle all the content of the flexible bag 25 have been discharged via the discharge cock 26. Arrangements are made to ensure that the pressure force of the compression springs 2 is sufficient at all stages of use of the liquid container. As the pressure force is greatest when the compression springs 2 are compressed, the weight of the contents of the flexible bag 25 will also be balanced and the pressure which causes the contents of the flexible bag 25 to flow out through the discharge cock 26 will in principle be constant throughout the use of the liquid container.

Conceivable modifications of the invention

[0023] In the embodiment described above, the compression springs 2 depicted in the form of coil springs have in principle a circular cylindrical outer contour. Within the scope of the present invention, it is also possible to conceive of using compression springs with a conical outer contour. With suitable conicity, compression of these compression springs will result in mutually adjacent wire turns not piling up on one another in a height direction but the possibility in the ideal case of their being in a single plane, thereby further reducing the axial extent of the spring in a pressed-together state.

[0024] In the embodiment described above of a liquid container , the pressure element 6 is loosely resting on the bottom 23 of the shell 20. Within the scope of the present invention, it is conceivable for the pressure element to be fastened adhesively to a shell blank, said fastening being effected to the portion of the blank which will constitute the bottom of the shell. A further alternative is for the pressure element to be fastened, e.g. by adhesive bonding, to the bottom of the bag before the bag is inserted downwards into the shell.

[0025] In the embodiment described above, the releasable locking means take the form of mutually cooperating hooklike means, but it is possible within the scope of the present invention to conceive of the releasable locking means being configured in various different ways. By way of non-limitative example it may be mentioned that the plates may be mutually connected by a holding-together means which comprises a fracture indication whereby the holding-together means is caused to break, preferably manually, when the pressure element is to be put into an active state.

Claims

1. A pressure element (6) intended to be used in a liquid container comprising a rigid outer shell (20), a bag (25) which is disposed inside the outer shell (20), wherein said bag (25) is made of flexible material impermeable to liquid and is provided with a discharge means (26) which in the state of use of the liquid container runs through the shell (20), said pressure element (6) being intended to be placed between the bottom of the outer shell (20) and the bottom of the bag (25), **characterised in that** the pressure element (6) comprises two plates (1, 3), that at least one force-generating means (2) is disposed between the plates (1, 3), that the force-generating means (2) endeavours to urge the plates (1, 3) away from one another in a direction transverse to the main plane of the plates (1, 3), and that the pressure element (6) has releasable locking means (10, 18) for holding the plates (1, 3) in a pressed-together state.

2. A pressure element (6) according to claim 1, **characterised in that** the force-generating means takes the form of at least one compression spring (2).

3. A pressure element (6) according to claim 1 ore 2, **characterised in that** the force-generating means takes the form of two compression springs (2).

4. A pressure element (6) according to any one of claims 1-3, **characterised in that** the releasable locking means comprises two hooklike means (10, 18), that the one hooklike means (10) is anchored in the one plate (1), and that the second hooklike means (18) is anchored in the other plate (3).

5. A pressure element (6) according to claim 4, **characterised in that** the one hooklike means (10) is provided with an activation means (11) and is fastened flexibly to the one plate (1).

Patentansprüche

1. Druckelement (6), welches für die Verwendung in einem Flüssigkeitsbehälter vorgesehen ist, der eine starre äußere Hülle (20) und einen Beutel (25) aufweist, der innerhalb der äußeren Hülle (20) angeordnet ist, wobei der Beutel (25) aus einem flexiblen, für Flüssigkeit undurchlässigen Material hergestellt und mit einer Auslasseinrichtung (26) ausgestattet ist, die im Gebrauchszustand des Flüssigkeitsbehälters durch die Hülle (20) hindurch verläuft, wobei das Druckelement (6) für die Anordnung zwischen dem Boden der äußeren Hülle (20) und dem Boden des Beutels (25) vorgesehen ist, **dadurch gekennzeichnet, dass** das Druckelement (6) zwei Platten (1, 3) aufweist, dass zumindest eine Krafterzeugungseinrichtung (2) zwischen den Platten (1, 3) vorgesehen ist, dass die Krafterzeugungseinrichtung (2) die Tendenz hat, die Platten (1, 3) in einer Richtung senkrecht zur Hauptebene der Platten (1, 3) auseinanderzudrücken und dass das Druckelement (6) eine lösbare Verriegelungseinrichtung (10, 18) für das Zusammenhalten der Platten (1, 3) in einem zusammengedrückten Zustand aufweist.

2. Druckelement (6) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Krafterzeugungseinrichtung die Form zumindest einer Druckfeder (2) hat.

3. Druckelement (6) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Krafterzeugungseinrichtung die Form von zwei Druckfedern (2) annimmt.

4. Druckelement (6) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die lösbare Verriegelungseinrichtung zwei hakenförmige Teile (10, 18) aufweist, dass das eine hakenartige Teil (10) in der einen Platte (1) verankert und das zweite hakenartige Teil (18) in der anderen Platte (3) verankert ist.

5. Druckelement (6) nach Anspruch 4, **dadurch gekennzeichnet, dass** das eine hakenartige Teil (10) mit einer Aktivierungseinrichtung (11) versehen und flexibel an der einen Platte (1) befestigt ist.

Revendications

1. Élément presseur (6) destiné à être utilisé dans un contenant pour liquide comprenant une enveloppe extérieure rigide (20), un sachet (25) qui est disposé à l'intérieur de l'enveloppe extérieure rigide (20), dans lequel ledit sachet (25) est constitué d'un matériau souple imperméable aux liquides et est muni d'un moyen de vidange (26) qui, dans l'état d'utilisation du contenant pour liquide, traverse l'enveloppe (20), ledit élément presseur (6) étant destiné à être placé entre le fond de l'enveloppe extérieure (20) et le fond du sachet (25), **caractérisé en ce que** l'élément presseur (6) comprend deux plaques (1, 3), **en ce que** au moins un moyen générateur de force (2) est disposé entre les plaques (1, 3), **en ce que** le moyen générateur de force (2) s'efforce d'écarter les plaques (1, 3) l'une de l'autre dans une direction transversale au plan principal des plaques (1, 3), et **en ce que** l'élément presseur (6) possède des moyens de verrouillage libérables (10, 18) destinés à maintenir les plaques (1, 3) en état d'être comprimées l'une contre l'autre.

2. Élément presseur (6) selon la revendication 1, **caractérisé en ce que** le moyen générateur de force prend la forme d'un ressort de compression (2).

3. Élément presseur (6) selon la revendication 1 ou 2, **caractérisé en ce que** le moyen générateur de force prend la forme de deux ressorts de compression (2).

4. Élément presseur (6) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le moyen de verrouillage libérable comprend deux moyens semblables à un crochet (10, 18), **en ce qu'**un moyen semblable à un crochet (10) est ancré dans une plaque (1) et **en ce que** le second moyen semblable à un crochet (18) est ancré dans l'autre plaque (3).

5. Élément presseur (6) selon la revendication 4, **caractérisé en ce qu'**un moyen semblable à un crochet (10) est muni d'un moyen d'actionnement (11) et est fixé, de manière élastique, à une plaque (1).

Fig. 1

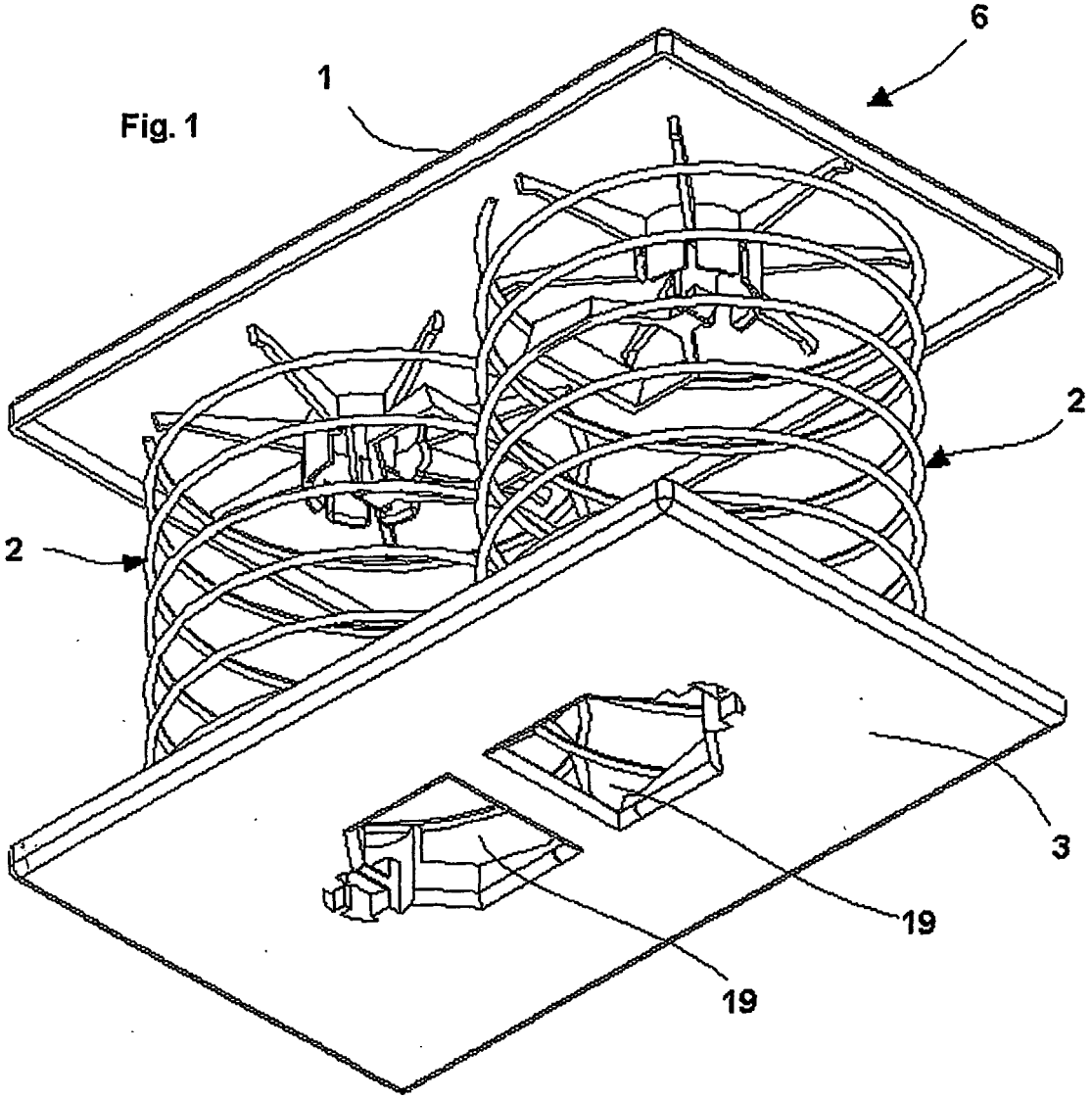


Fig. 2

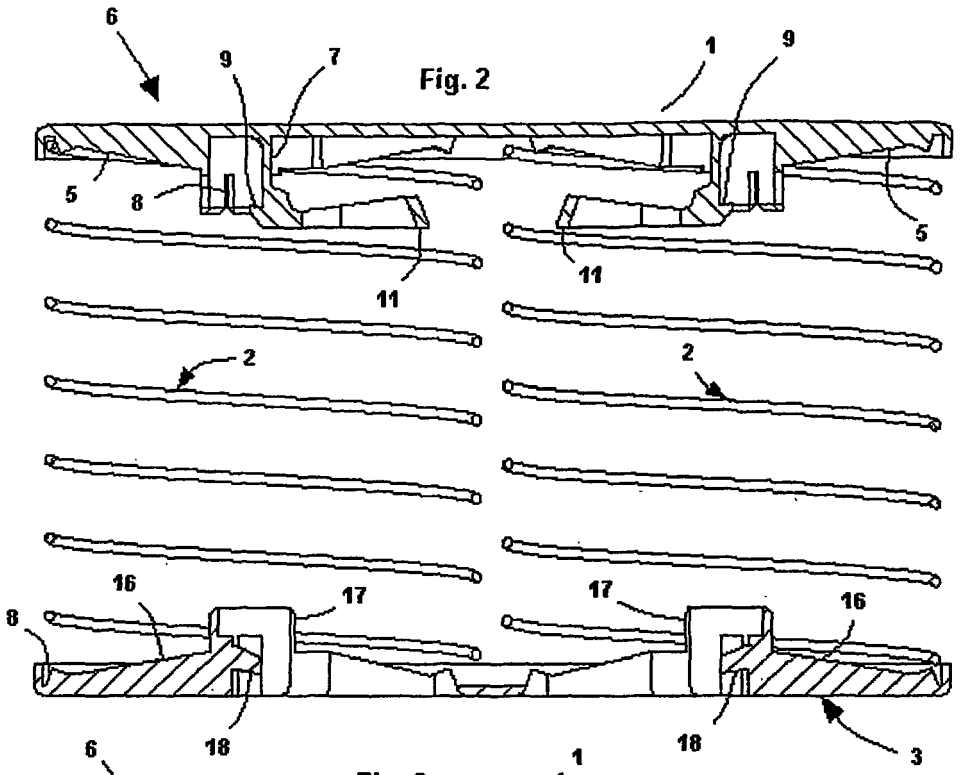


Fig. 3

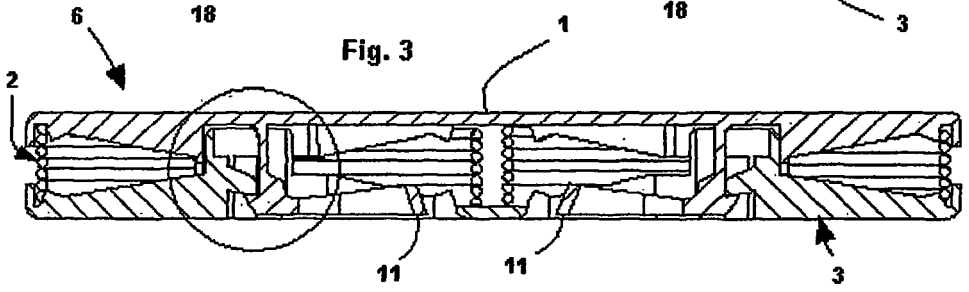


Fig. 4

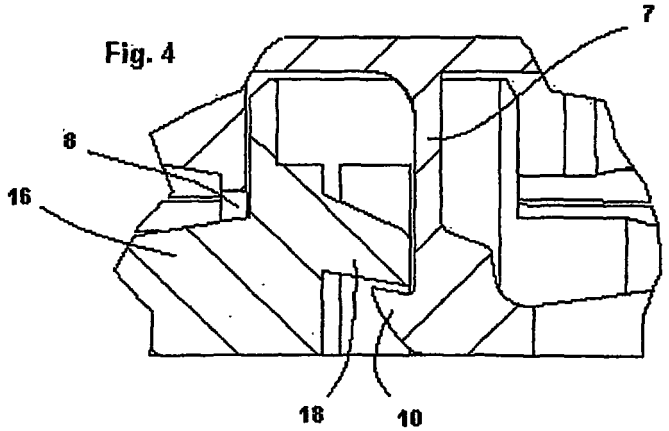


Fig. 5

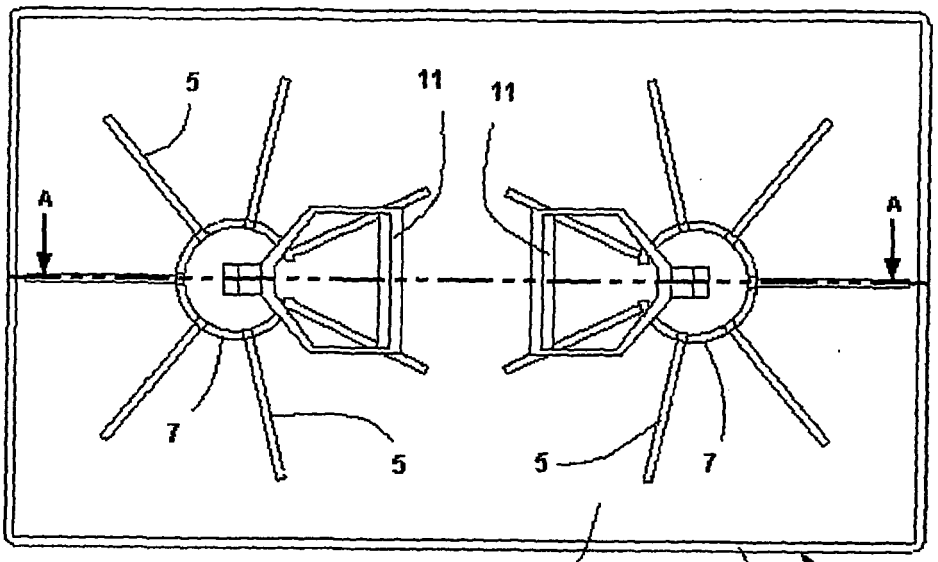


Fig. 6

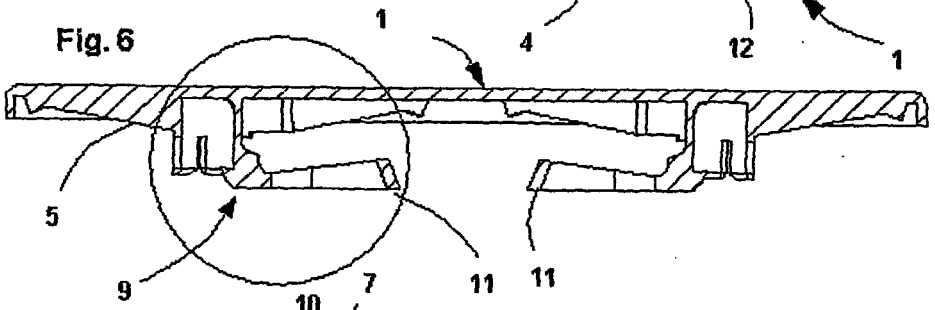


Fig. 7

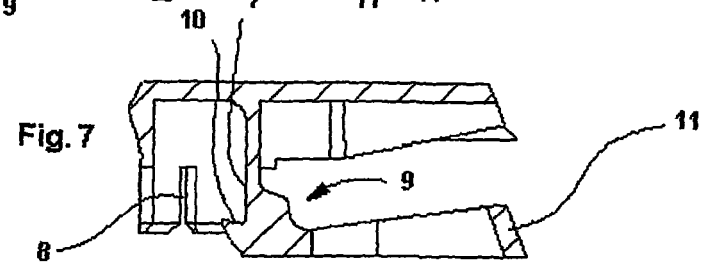


Fig. 10

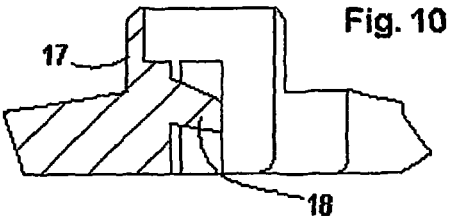


Fig. 9

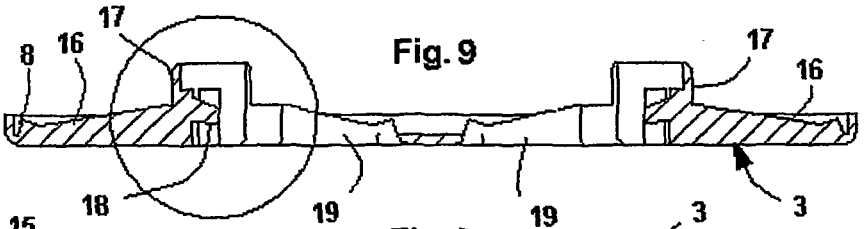


Fig. 8

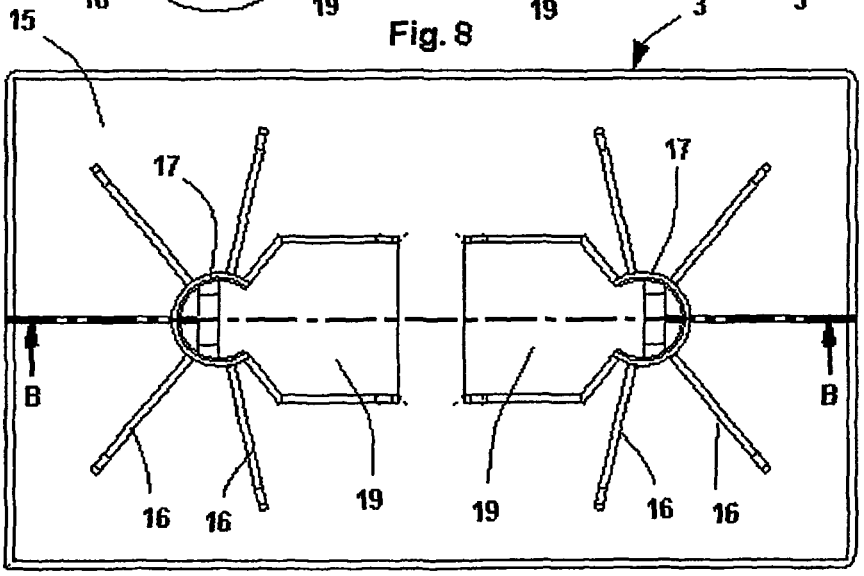
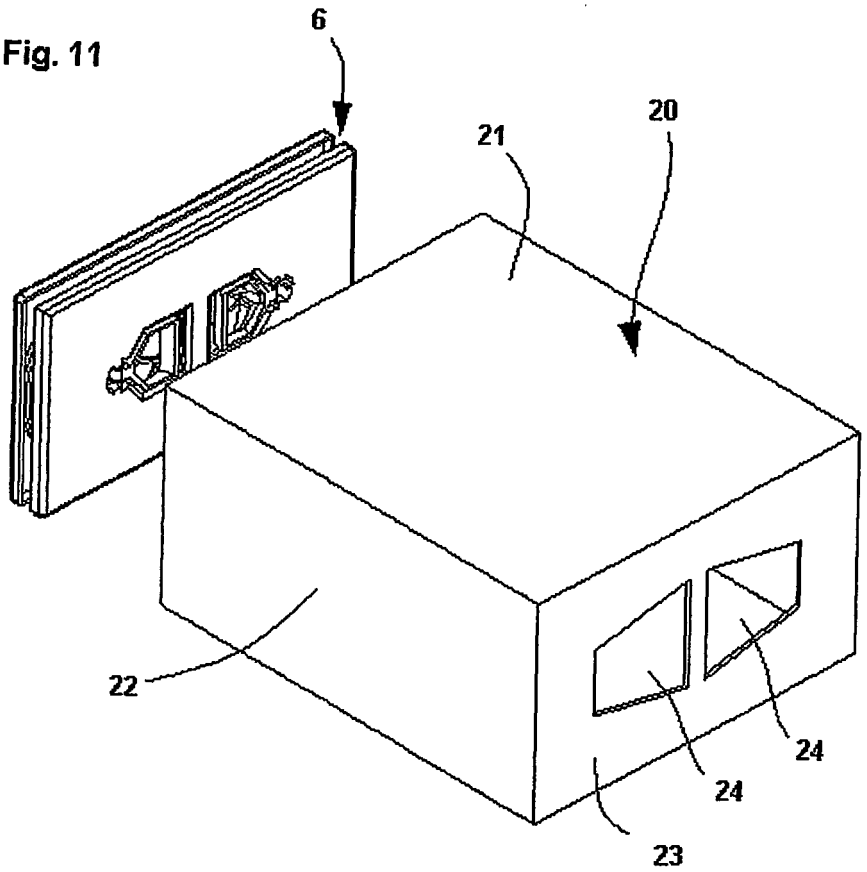


Fig. 11



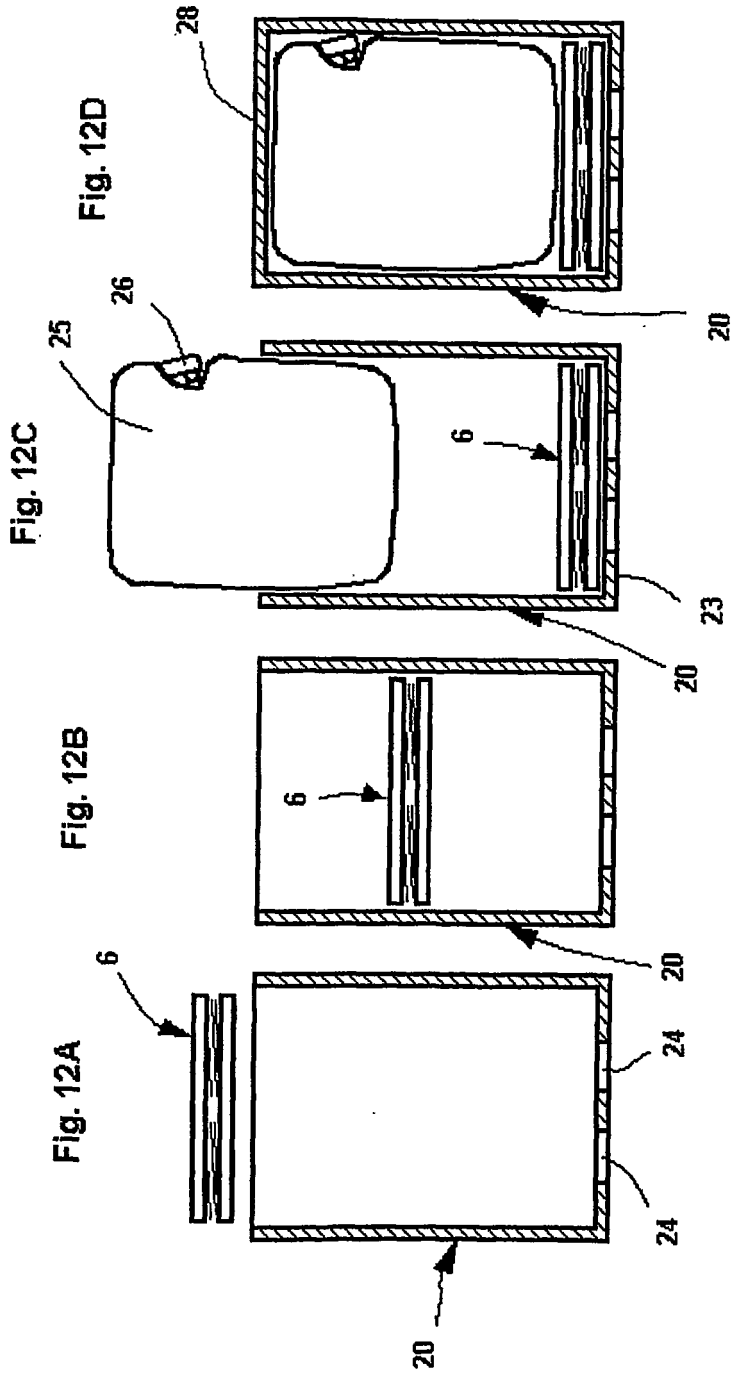

Fig. 12A
6
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Fig. 12B
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Fig. 12C
25
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6
23
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Fig. 12D
28
20

Fig. 13

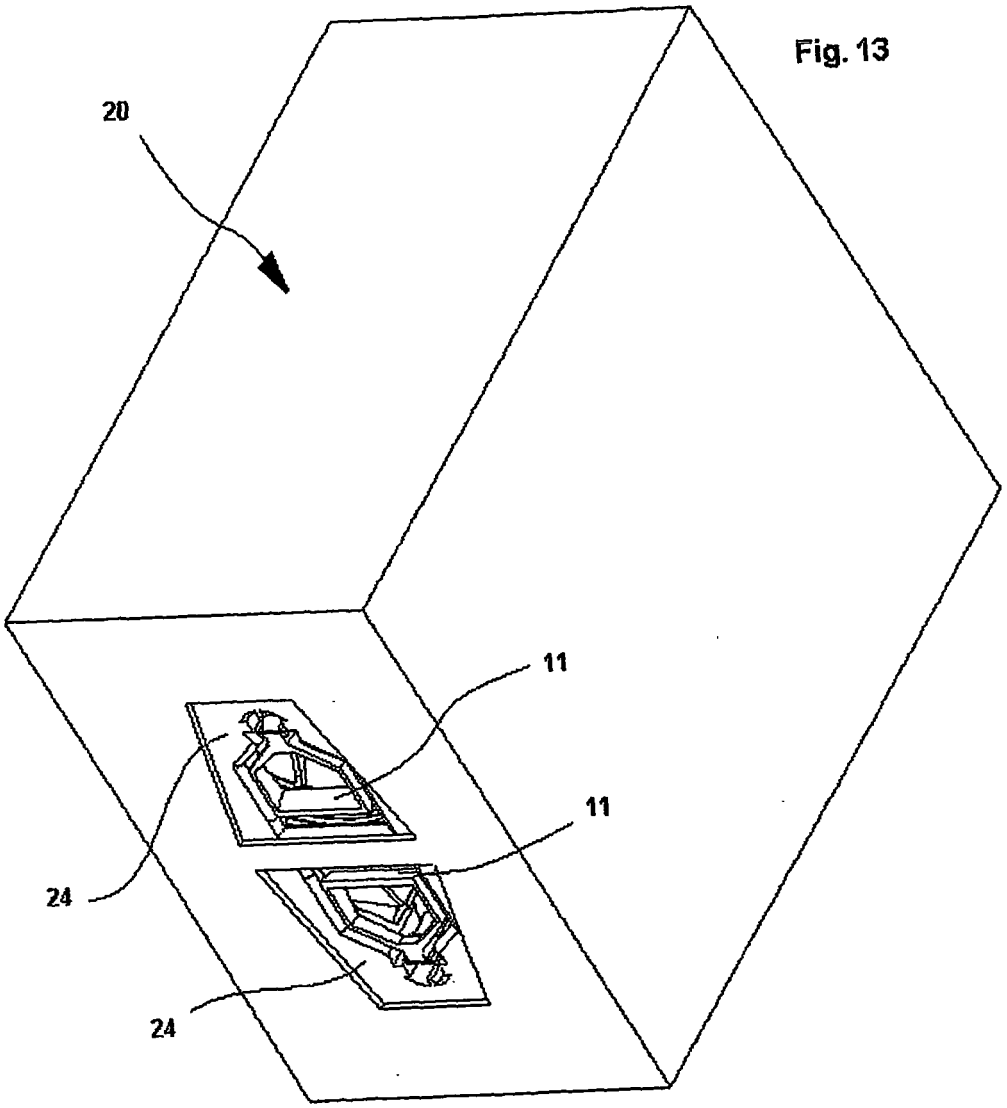


Fig. 14C

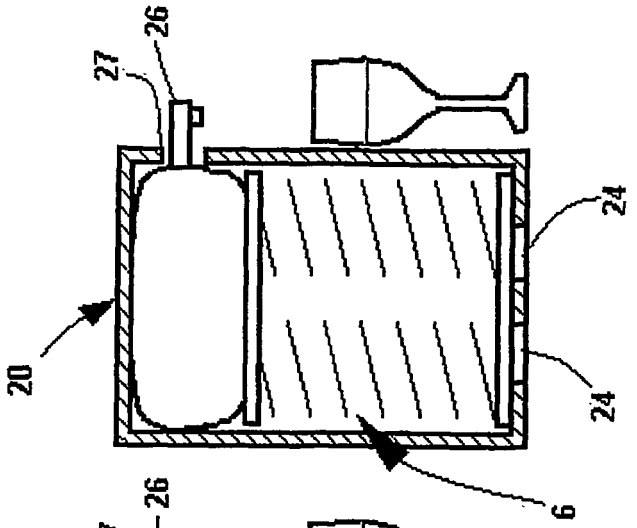


Fig. 14B

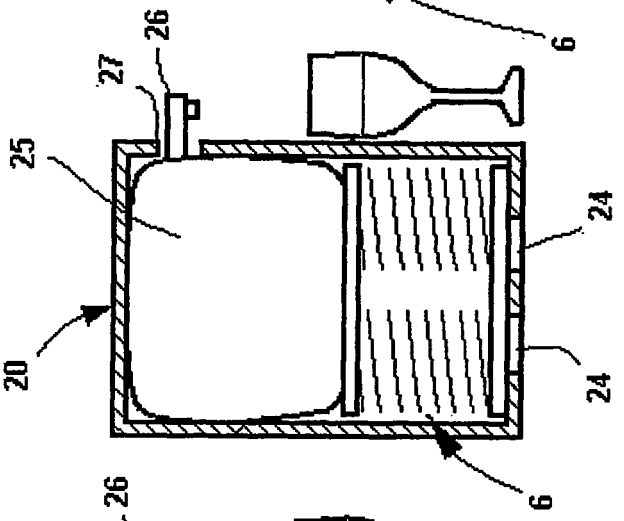


Fig. 14A

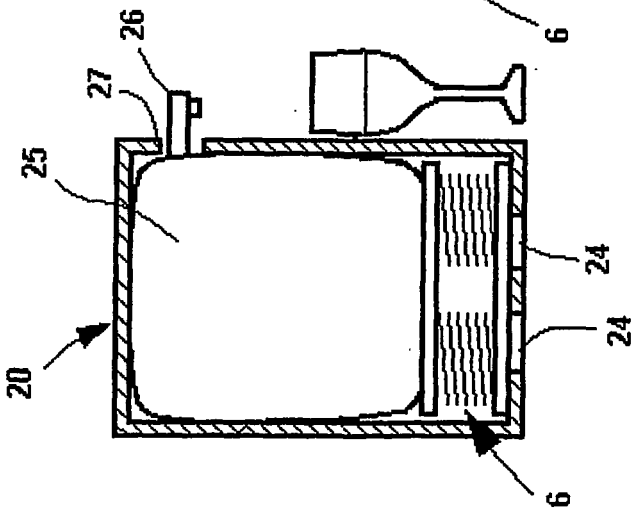


Fig. 15

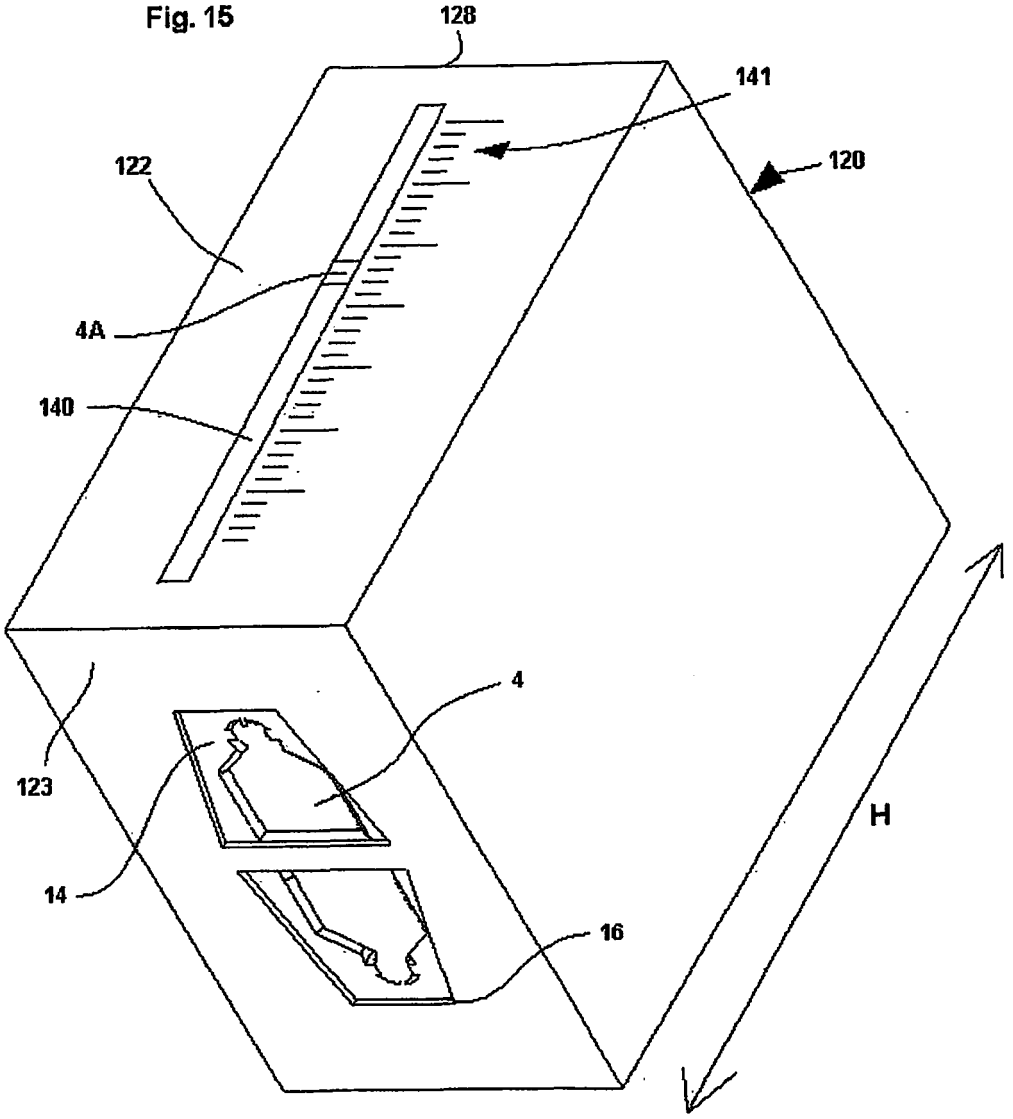


Fig. 16

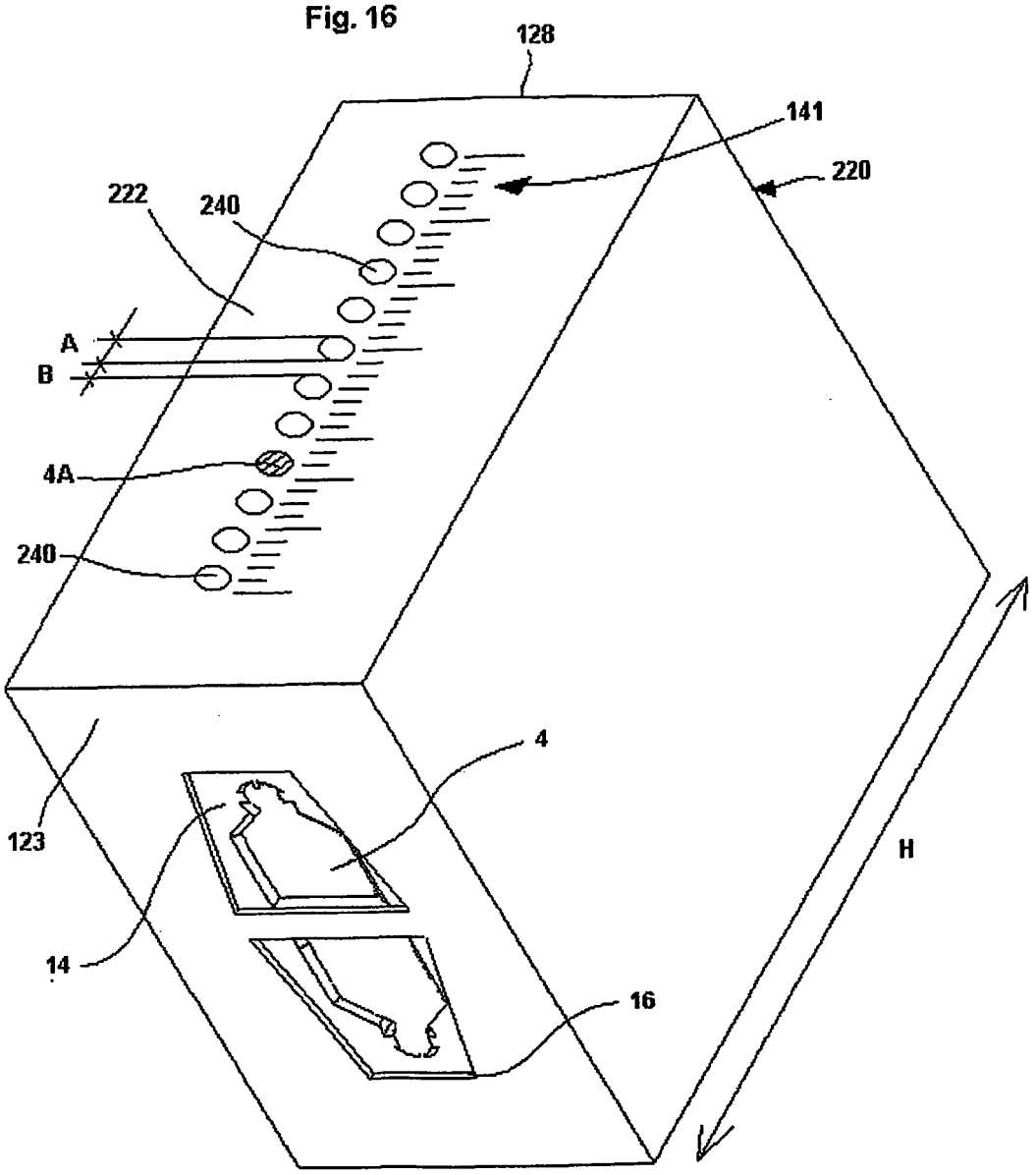


Fig. 17

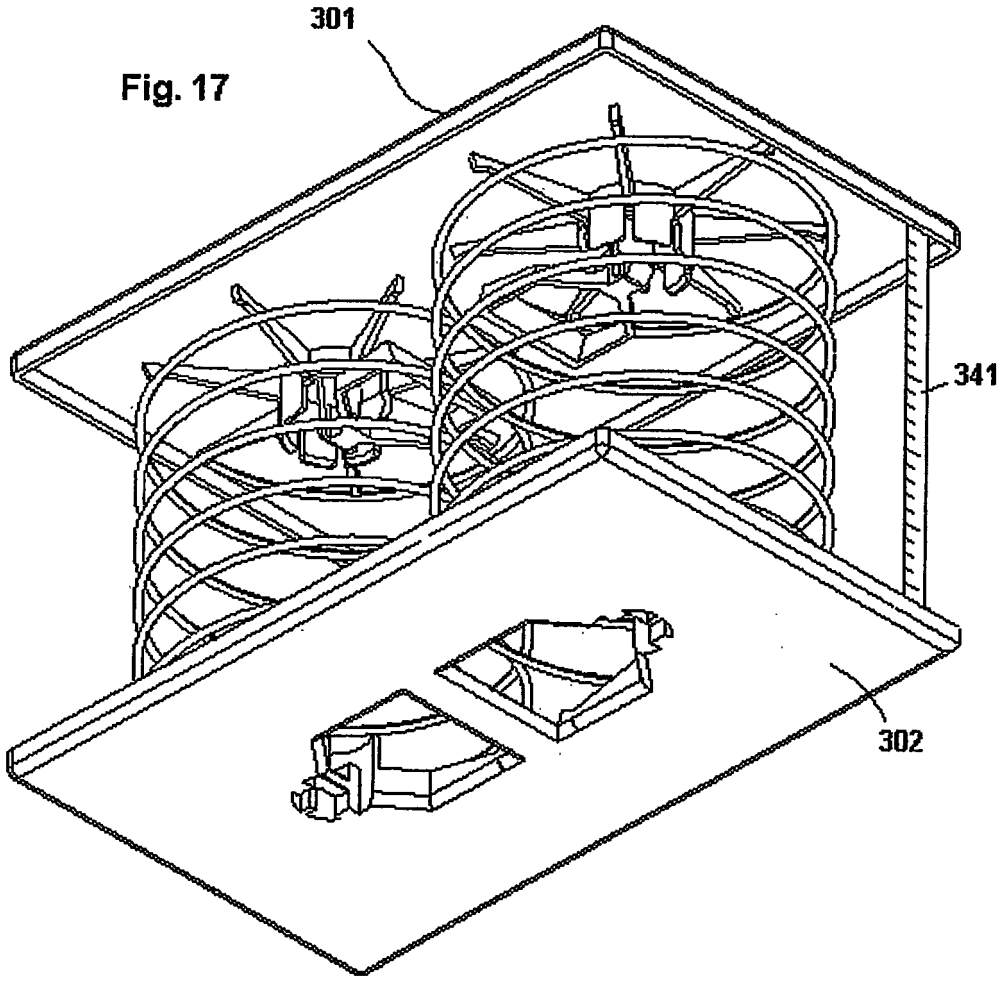


Fig. 19

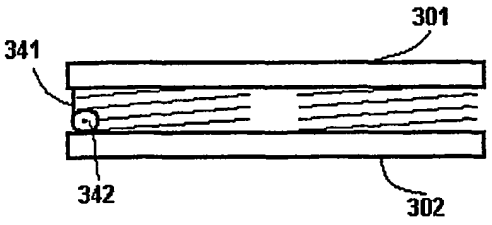


Fig. 20

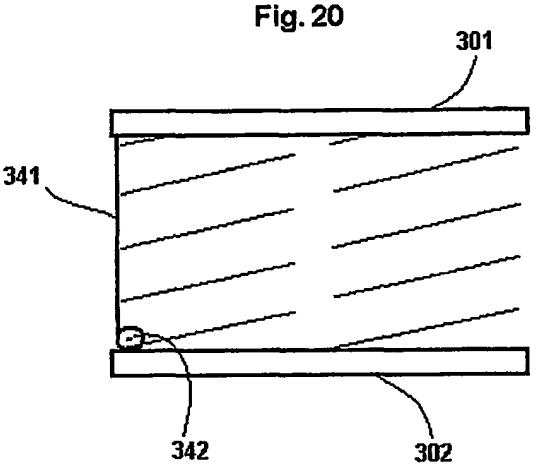


Fig. 18

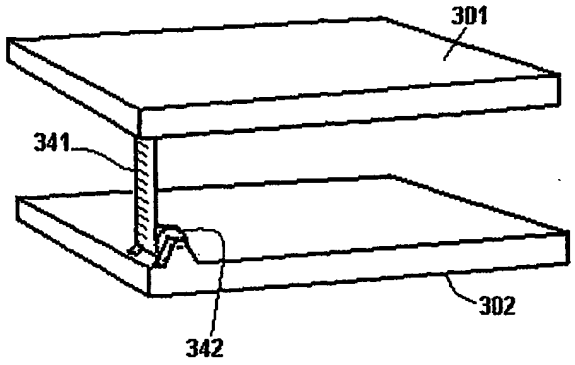
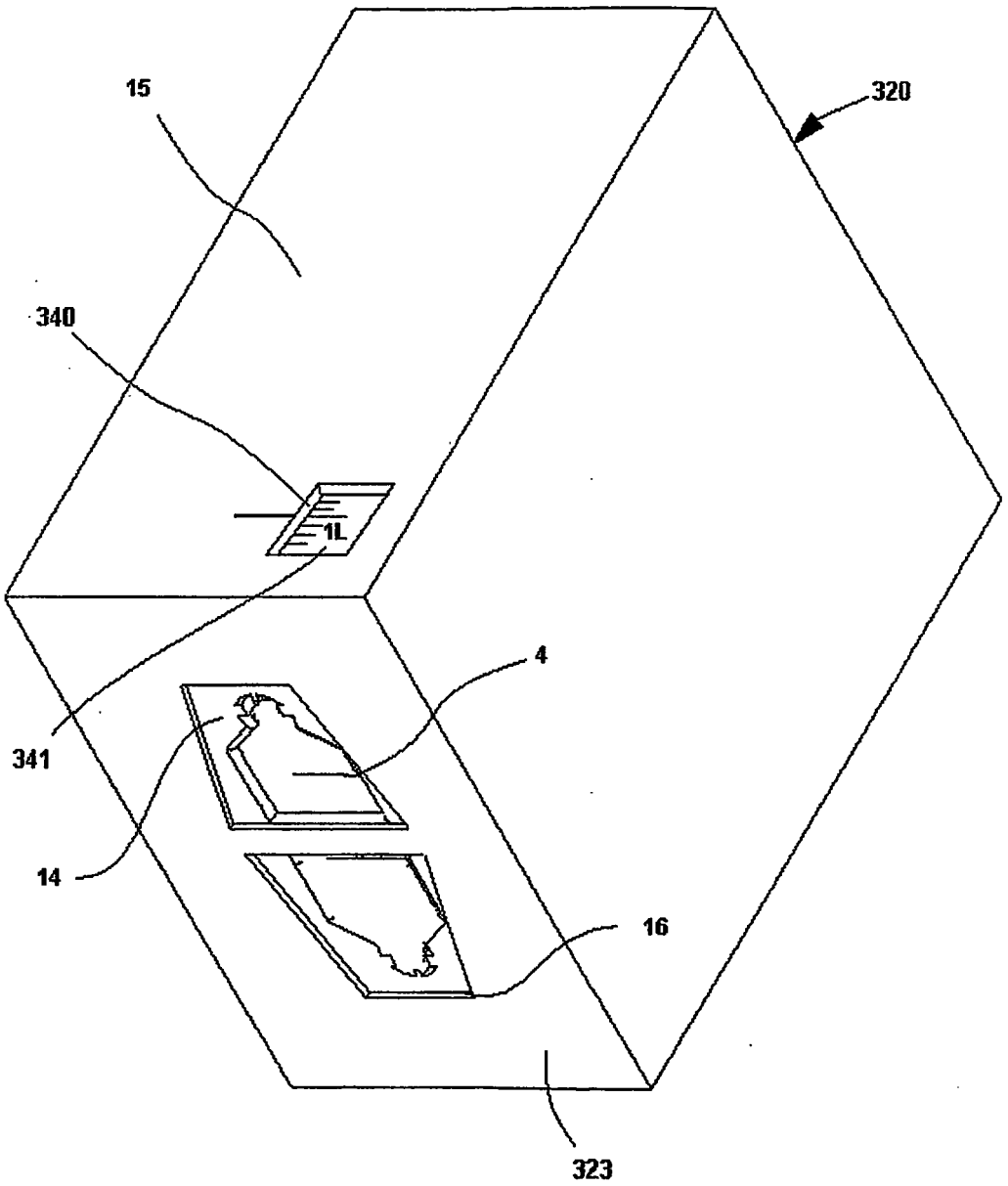


Fig. 21



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- SE 2005001932 W **[0002]**
- WO 0142090 A **[0003]**