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(54) **Child-resistant closure**

Kinder Sicherheitsverschluss

Fermeture à l'épreuve des enfants

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Description

The subject invention relates to a container-lid assembly according to the preamble of claim 1. Such a container-lid assembly is known from US-A-4,535,903. Such containers are used for example for packaging products, which should preferably not be accessible to children. Examples thereof are health-affecting chemicals, such as drugs.

When designing child-proof closures for packages containing drugs, consideration must also be given to the fact that geriatric patients should be able to open such packages.

In practice, this means that closures for packages have to be designed such that, if a specific group of children has been shown how to open the container, they are unable to reproduce this action, whereas a less able patient can indeed perform it.

In US-A-4,535,903 a lid is described having a tongue which can be moved outwardly from the circumference of the lid. The circumference of the lid is otherwise flush with the upper part of the container, such that if the tongue is in its retracted position it is not possible to firmly engage the lid and open the lid. By moving the tongue outwardly, such that a part of it protrudes from the lid, an engagement surface is created for grasping and opening the lid.

Although this is a first step to a child-proof container closure it has been shown that if a child once sees opening of the lid through outward movement of the tongue, it can repeat such an action relatively easy.

Because of that the invention aims to provide a further save guard making opening of the package by children nearly impossible whilst keeping opening of the lid relatively easily for other persons, such as geriatric patients.

This aim is realized with a container-lid assembly as described above having the characteristic features of claim 1. Through the provision of manually operative rotatable blocking means it is necessary for a user to first act on these blocking means to make the movement of the tongue possible at all, such that an edge of it can be moved outside of the circumference of the container-lid assembly. These blocking means can be realized on the one hand such that inward movement of the tongue is only possible after or effects repositioning of the blocking means such that at the end of the return movement of the tongue, the tongue is automatically blocked. On the other hand it is possible to design the blocking means such that in the position wherein the tongue can be moved, it is free to move to-and-fro and the blocking means will not automatically return to their blocking position. The last embodiment is of importance if the container-lid assembly is to be used for elder patients wherein the presence of children is not probably. In that case the "unsafe" position of the tongue is not of importance. However, if the presence of children is substantial, the first embodiment is preferable.

The blocking means for the tongue can comprise any means known in the art. To keep operation of both the blocking means and the tongue easily on the one hand, and to make the way of opening of the lid and movement of the tongue as difficult to be understood as possible for children on the other hand, according to a preferred embodiment of the invention, the blocking means comprise the operating means for the tongue. This means that first of all the blocking means have to be manipulated such that the tongue can freely be moved and after that the blocking means act to operate the tongue.

To prevent opening of the lid from the container through introduction of a sharp object, such as a knife, between the lid and the container as much as possible by children, according to a preferred embodiment protruding edges are provided at the upper part of the container between which the lid is received. In contrast to the container-lid assembly according to the US-A-4,535,903, it is not possible to introduce objects such as knifes or screw drivers between the lid and the container resulting in an opening force of the lid.

According to a preferred embodiment of the invention the blocking means comprise a cam being connected with the tongue, wherein the cam and tongue can be slide to-and-fro in the lid. The cam can be engaged by a curved disc being a part of a rotating ring provided in the upper part of the lid and having gripping members. Through rotation of the ring the cam can be positioned in front of a free part of the curved disc such that the tongue together with the cam can freely move to-and-fro. However, if the curved disc is in another position, movement of the cam, and so movement of the tongue is blocked. In this embodiment it is possible to store the container in an unsafe position, i.e. in the position wherein the curved disc permits free movement of the cam, or to store the container in a safe position, i.e. wherein the curved disc is in any other position blocking movement of the cam.

According to another embodiment the blocking means comprise a rotatable blocking disc of which one extremity is provided with operating means and of which the other side is provided on the one hand with means for rotatable engagement with the tongue and on the other hand a non circular curved portion received in a slit provided in the lid. The slit is realized such that transferral of the curved position in the slit can only be realized in predetermined positions. In this way it is possible to operate the tongue through the blocking disc only if this blocking disc is in a predetermined position. In all other positions the movement of the disc and so movement of the tongue is prevented by abutment of the curved part and the boundary of the slit.

To improve ease of use of the container-lid assembly according to a preferred embodiment markings are provided on at least one of the rotating ring, blocking disc, or the upper face of the lid to orientate the rotating ring or blocking disc relative to the lid.

Although the circumference of the lid, such as the protruded edges described above, and the part to which the hinge is connected can be integrally moulded with the container, according to a preferred embodiment below the blocking/operating means a further lid surface is provided connected with blocking means cooperating with corresponding means in the container. In this way it is possible to realize a lid assembly comprising a lid proper and cooperating circumferential edge which can be snapped or connected in any other way known in the art to various types of containers.

The invention will be further elucidated referring to preferred embodiments of the invention shown in the drawings.

In the drawings:

Figure 1 shows a perspective view of a first embodiment of the container-lid assembly according to the invention;

Figure 2 shows in an exploded view schematically the structure of the upper part of the container-lid assembly according to Figure 1;

Figure 3 and 3a show details of the locking structure according to the embodiment of fig. 1, wherein in fig. 3 the lid is shown in closed position in cross section on the container;

Figure 4 the container-lid assembly according to Fig. 3 in open position;

Figure 5 shows in perspective view a second embodiment according to the invention;

Figure 6a and 6b show in cross section the embodiment of figure 5, in fig. 6a in closed position and in fig. 6b in open position;

Figure 7 shows a detail of the second embodiment;

Figure 8 shows a third embodiment shown in perspective of a container-lid assembly according to the invention;

Figure 9 a container-lid assembly according to Figure 8 in cross section in closed position; and

Figure 10 the container-lid assembly in cross section according to figure 8 in open condition.

In Fig. 1 the container-lid assembly is generally referred to with 1. It comprises a container having reference number 2 and being provided with an opening 30 and a lid generally referred to with 3. As is clear from figure 2, lid 3 comprises a circumferential edge 31 to which lid part 32 is connected. From figure 3 it is clear that this lid part has an upper face 4 and a lower face 5. Inbetween, a space is defined for receiving a tongue 6, which can move in and out the lid as is clear from comparison of figures 3 and 4. Cam 7 is provided on tongue 6. Between upper face 4 and lower face 5 a rotating ring 8 is provided, which, as is clear from figure 3a, is provided with a slit 9. In figure 3 slit 9 is shown at the left side of the drawing, such that cam 7 with its protrusion can just move below this slit 9. Rotating ring 8 is provided with engagement ears 10. To realize positioning of ring 8 as shown in figure 3a, markings 11 and 12 are realized on the ring and the upper face of the lid, respectively, as is shown in figure 1. Lid part 32 is provided with a sealing edge 13 snapping, as is clear from figure 3, in a corresponding receiving section 14 of the container. The container furthermore comprises a circumferential groove 15 in which a protrusion 16 of the circumferential edge 31 can be accommodated. As is clear from figure 1, front side 19 of the lid and front side 20 of the container are flush.

The embodiment shown in figures 1 and 4 functions as follows:

During production, container having different sizes are realized of which the neck of opening 30 is always the same. Because different containers always have the same circumferential edge 31, lids can be snapped onto said containers, wherein the protruding part 16 engages the circumferential groove of the container. The lid is connected with this circumferential edge through hinge 18. If the lid is in its snapped position, which is realized through cooperation of parts 13 and 14, a flush transition between the front faces 19 and 20 results if tongue 16 is moved inwardly as is clear from figure 1. Because of that it is not possible for the (young) user to remove the lid from the container. The force of engagement between the lid part 32 and the container is too large. If the lid has to be opened, it is necessary to move tongue 6 outwardly to the position shown in figure 4. In this position it is possible to press under tongue 6 such that the lid is opened. Tongue 6 can only be moved in an outward direction by moving in the leftward direction of cam 7 from the position according to figures 1 and 3. This movement of cam 7 is restricted in all positions by rotating ring 8 except in case wherein slit 9 is moved in leftward direction, i.e. in the position wherein the markings 11 and 12 are in front of each other. After taking of an article from the container, the user can choose whether or not to relock the lid through inward movement of the tongue and rotating of the rotating ring.

In figures 5-7 a second embodiment of the container-lid assembly according to the invention is shown. This most preferred embodiment comprises a container, but in contrast to the previous first embodiment, lid 32 is integrally formed with the container. Such an embodiment is interesting if a large number of the same containers has to be produced and can for example be realized by injection moulding. Lid 32 is connected to the container through film hinge 48.

Lid 32 is provided with an internal slit 39 to accommodate tongue 52 having an opening 35. A pin-shaped part 45 of a blocking disc 38 can be introduced in an opening 37 of tongue 52. To elucidate the shape of this pin-shaped part 45, it is separately shown in fig. 7 between blocking disc 38 and lid 32 in dash lines. The flat portion of this pin has reference 46. From fig. 7 it is clear that pin 45 can extend through both the left and right side of opening 45, but can only be displaced from the left side to the right side or v.v. in the position, in

which the flat portion 46 of pin 45 is directed to protrusion 36. Pin 45 is rotatably received in opening 35. Markings 41 and 42 are provided to obtain an indication for a correct position of blocking disc 38.

As described above, transfer of blocking disc 38 is only possible if the flat portion 46 on pin 45 is directed to protrusion 36. In that position the tongue can be moved out of the circumference of the container as is shown in fig. 6a. In that position it is possible to engage the lid and to remove it from the container as shown in fig. 6b. Opposite protruding edges 50 of the container prevent acces of a knife, screw driver and so on for forced opening of the lid.

In figures 8-10 a third embodiment of the invention is shown. In this embodiment, a container 2 is provided having a lid, now indicated with 23. The lid also has a circumferential edge and a lid portion. The circumferential edge is realized in the same way as in the embodiment as described above, whilst the lid part has been given reference number 33. The lid portion 33 is connected to the circumferential edge 31 through hinge 28. The lid part 33 comprises as in the previous embodiments an upper face 24 and a lower face 25 in between a tongue 22 is provided. In the upper face an opening 27 is realized. The tongue is extended with a curved part 29 extending through opening 27. For positioning of the curved part, the upper face of the lid is provided with protruding edges 26.

The embodiment described above functions as follows: Starting from the closed position shown in fig. 9, the user has to exert a force through opening 27 on curved part 29. Because of that tongue 22 will move outwardly, such that a gripping portion is provided through which the lid can be pivoted with respect to the container. In this embodiment after relieving the curved part 29 this will always resiliently move back to the position shown in fig. 9 such that after closing of the lid always automatically safety is ensured.

Claims

1. Child-resistant container-lid assembly comprising a pivotable lid (13, 23, 32) having an engagement tongue (6, 22, 52) slidable between an inward and an outward position, wherein in the inward position the tongue is flush with the adjacent surface of the lid and in the outward position provides an engagement surface for pivoting the lid into an opened position, **characterized in that,** a manually operative rotatable blocking member (8,38) is provided on said lid for blocking the engagement tongue (6,22,52) in said inward position, and upon rotation of said member releasing said tongue to be slidable in the outward position.

2. Container-lid assembly according to claim 1, wherein the container is provided with a circumferential groove (15) accommodating therein protruding edges (16) of the lid.

3. Container-lid assembly according to claim 1, wherein said rotatable blocking member comprises a ring (8) having gripping members (10), the lower side of said ring having a curved surface engaging a cam said cam which is provided on said tongue.

4. Container-lid assembly according to claim 1, wherein said rotatable blocking member comprises a disc (38) which is provided with gripping means, and, on the lower surface with means (45) for rotatable engagement with the tongue and with a non-circular curved part (35) accommodated in a slit provided in the lid, said slit being designed such that movement of the non-curved part in the slit with respect to said means (45) can only be realized a predetermined position of said disc.

5. Container-lid assembly according to claim 1, wherein on at least one of the rotatable blocking member or upper face of the lid markings (11,12,41,42) are provided for orientation of said blocking member with respect to said lid.

6. Container-lid assembly according to claim 1, wherein a lid connecting element (31) is provided, cooperating with locking means on the container.

7. Container-lid assembly according to claim 6, wherein the locking means are snap sealing means.

8. Container-lid assembly according to claim 1, wherein the hinge is a part of a circumferential edge of the lid, said lid being permanently connected to the container.

Patentansprüche

1. Kindersichere Behälter-Deckel-Anordnung mit einem schwenkbaren Deckel (13, 23, 32) mit einer Griffzunge (6, 22, 52), die zwischen einer Einwärts- und einer Auswärtsposition verschiebbar ist, wobei in der Einwärtsposition die Zunge bündig mit der benachbarten Oberfläche des Deckels ist und in der Auswärtsposition eine Grifffläche zum Schwenken des Deckels in eine geöffnete Position vorsieht, dadurch gekennzeichnet, daß ein manuell betätigtes drehbares Blockierteil (8, 38) an dem Deckel zum Blockieren der Griffzunge (6, 22, 52) in der Einwärtsposition und nach Drehung des Teils zum Lösen der Zunge vorgesehen ist, damit sie in die Auswärtsposition verschiebbar ist.

2. Behälter-Deckel-Anordnung nach Anspruch 1, wobei der Behälter mit einer Umfangsrille (15) versehen ist, in der vorstehende Kanten (16) des Dek-

kels untergebracht sind.

3. Behälter-Deckel-Anordnung nach Anspruch 1, wobei das drehbare Blockierteil einen Ring (8) mit Greifteilen (10) aufweist, wobei die Unterseite des Rings eine gebogene Oberfläche hat, die in eine an der Zunge vorgesehene Nocke eingreift.

4. Behälter-Deckel-Anordnung nach Anspruch 1, wobei das drehbare Blockierteil eine Scheibe (38) aufweist, die mit einer Greifeinrichtung und auf der Unterseite mit einer Einrichtung (45) zum drehbaren Eingriff mit der Zunge und mit einem nichtrunden gebogenen Teil (35) versehen ist, das in einem in dem Deckel vorgesehenen Schlitz untergebracht ist, wobei der Schlitz so gestaltet ist, daß eine Bewegung des nichtrunden gebogenen Teils in dem Schlitz gegenüber der Einrichtung zum Eingriff nur in einer vorbestimmten Position der Scheibe erfolgen kann.

5. Behälter-Deckel-Anordnung nach Anspruch 1, wobei auf dem drehbaren Blockierteil und/oder der Oberseite des Deckels Markierungen (11, 12, 41, 42) zur Orientierung des Blockierteils gegenüber dem Deckel vorgesehen sind.

6. Behälter-Deckel-Anordnung nach Anspruch 1, wobei ein mit einer Verschlußeinrichtung an dem Behälter zusammenwirkendes Deckelverbindungselement (31) vorgesehen ist.

7. Behälter-Deckel-Anordnung nach Anspruch 6, wobei die Verschlußeinrichtung eine Rastabdichteinrichtung ist.

8. Behälter-Deckel-Anordnung nach Anspruch 1, wobei das Gelenk Teil einer Umfangskante des Deckels ist, wobei der Deckel dauerhaft mit dem Behälter verbunden ist.

Revendications

1. Ensemble conteneur-couvercle à l'épreuve des enfants comprenant un couvercle pivotant (13, 23, 32) ayant une languette d'engagement (6, 22, 52) pouvant coulisser entre une position intérieure et une position extérieure, dans lequel, dans la position intérieure, la languette est dans le même plan que la surface voisine du couvercle, et dans la position extérieure, elle fournit une surface de prise permettant de faire pivoter le couvercle dans une position ouverte, caractérisé en ce qu'un élément de blocage rotatif (8, 38) manoeuvrable manuellement est prévu sur ledit couvercle, en vue de bloquer la languette d'engagement (6, 22, 52) dans ladite position intérieure, et, par rotation dudit élément, de libérer ladite languette, en vue de son coulissement dans la position extérieure.

2. Ensemble conteneur-couvercle selon la revendication 1, dans lequel le conteneur comporte une rainure périphérique (15) destinée à recevoir les bords en saillie du couvercle.

3. Ensemble conteneur-couvercle selon la revendication 1, dans lequel ledit élément de blocage rotatif comprend une bague (8) comportant des organes de préhension (10), le côté inférieur de ladite bague ayant une surface arrondie rencontrant une came pratiquée sur ladite languette.

4. Ensemble conteneur-couvercle selon la revendication 1, dans lequel ledit élément de blocage rotatif comprend un disque (38) comportant des moyens de préhension, dont la surface inférieure comporte des moyens (45) de coopération rotatifs avec la languette, avec une portion arrondie non circulaire (35) venant se loger dans une entaille pratiquée dans le couvercle, ladite entaille étant conçue de telle manière que le déplacement de la portion non arrondie dans l'entaille par rapport auxdits moyens ne puisse se produire que dans une position prédéterminée dudit disque.

5. Ensemble conteneur-couvercle selon la revendication 1, dans lequel sur au moins l'élément de blocage rotatif, ou la face supérieure du couvercle (11, 12, 41, 42) sont pratiquées des marques pour l'orientation dudit élément de blocage par rapport audit couvercle.

6. Ensemble conteneur-couvercle selon la revendication 1, dans lequel est prévu un élément de connexion (31) coopérant avec les moyens de verrouillage du conteneur.

7. Ensemble conteneur-couvercle selon la revendication 6, dans lequel les moyens de verrouillage sont des moyens de fermeture par clipsage.

8. Ensemble conteneur-couvercle selon la revendication 1, dans lequel la charnière est une partie d'un rebord périphérique du couvercle, ledit couvercle étant réuni de manière permanente au conteneur.

fig-1

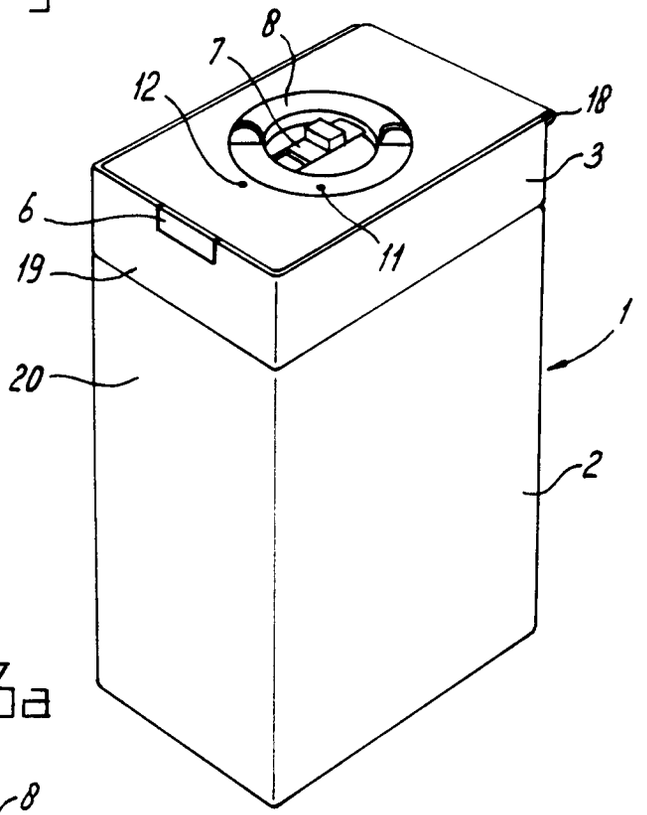

fig-3a

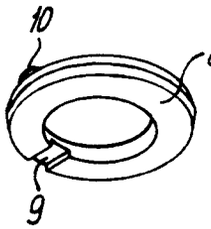

fig-3

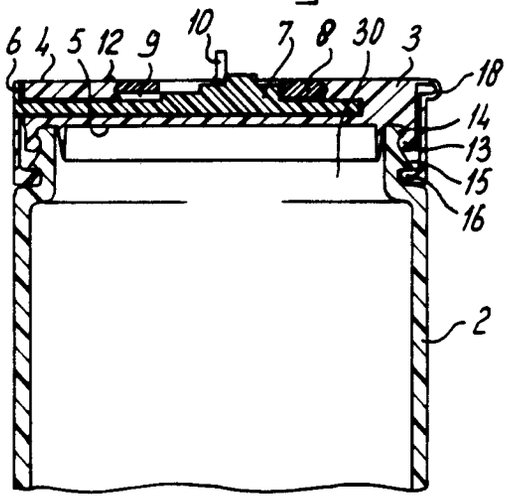

fig-4

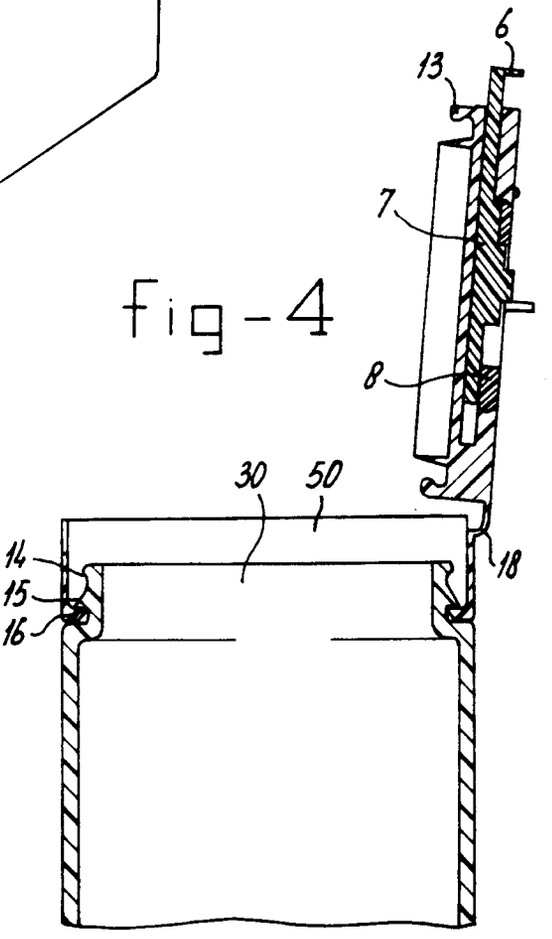

fig-2

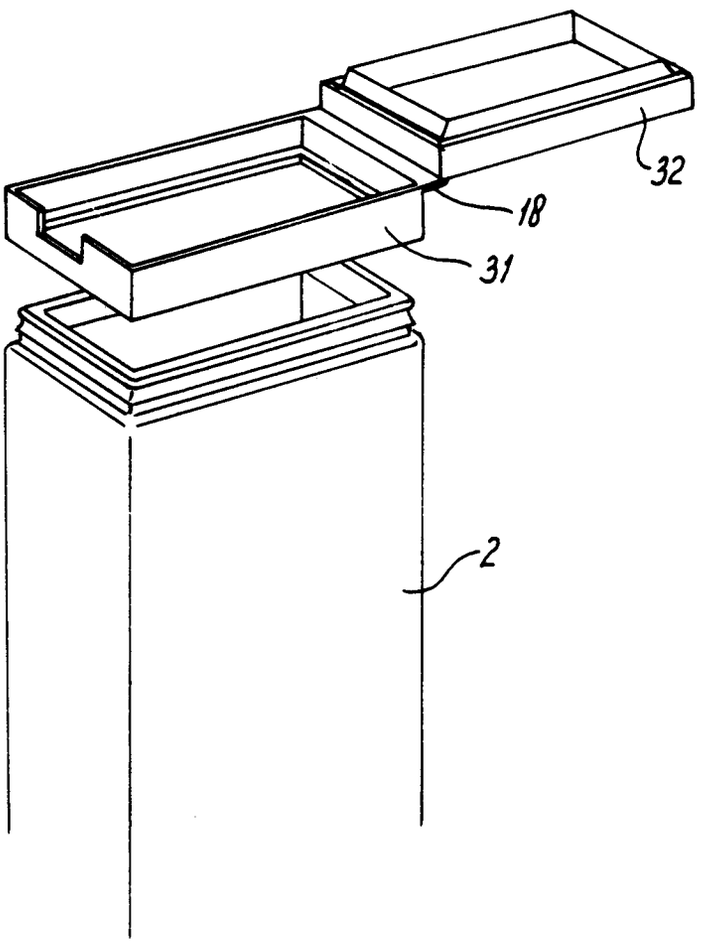

Fig-5

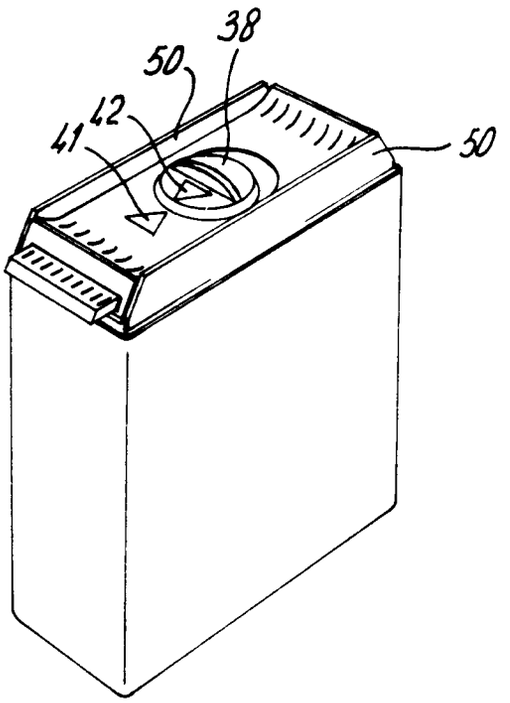

Fig-6a

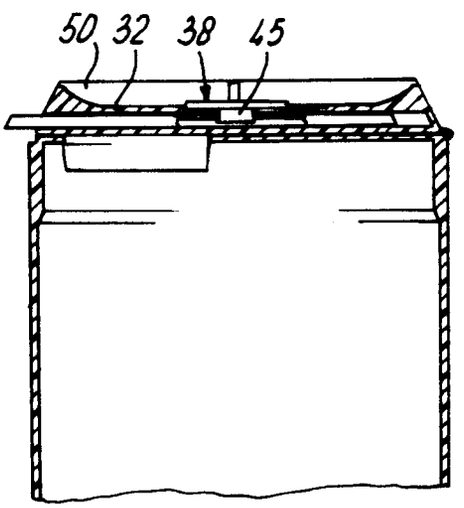

Fig-6b

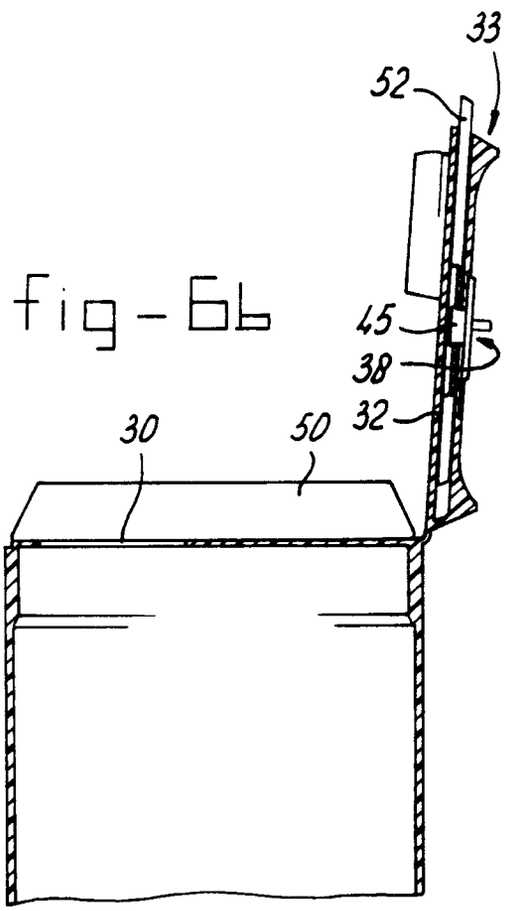

Fig-7

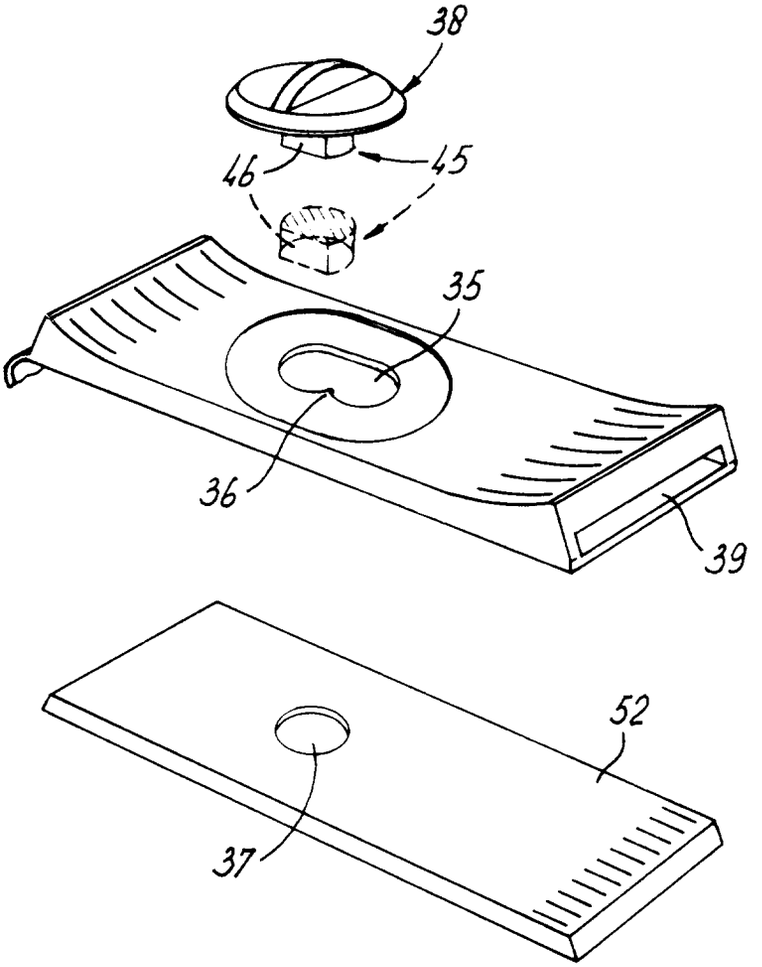

fig-8

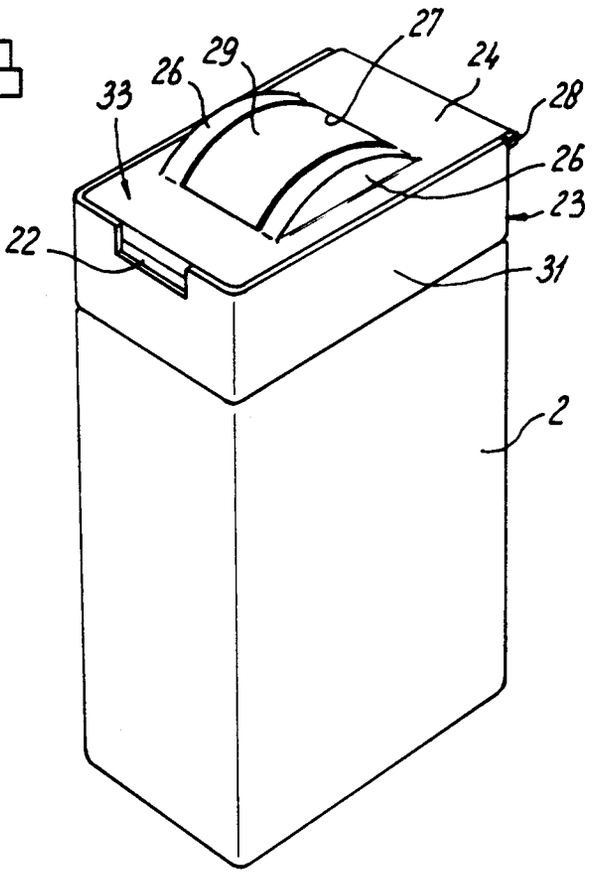

fig-9

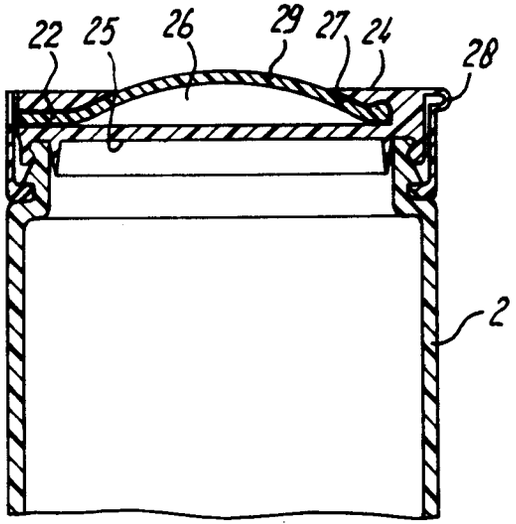

fig-10