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NOTICE OF ENTITLEMENT

I, ERNST HERRMANN of,9428 Walzenhausen SWITZERLAND being the applicant in respect of Application No. 34906/93 state the following:-

The person nominated for the grant of the patent is the actual inventor

The person nominated for the grant of the patent is the applicant of the basic application listed on the patent request form.

The person nominated for the grant of the patent is the applicant of the application listed in the declaration under Article 8 of the PCT.

The basic application(s) listed on the request form is the first application(s) made in a Convention country in respect of the invention.

By my Patent Attorneys,
WATERMARK PATENT & TRADEMARK ATTORNEYS

9th March 1995

Registered Patent Attorney

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(57) Claim

1. Safety closure of moulded synthetic material, particularly for wine bottles comprising in combination a rigid head provided with an inside thread, a separable portion connected to the rigid head by a circular tear-off safety zone, the separable portion comprising an upper ring and a lower skirt, the skirt having a truncated conical form narrowing in the direction of the ring and a height greater than the one of the head, the separable portion comprising opening means for breaking said portion in a substantially longitudinal direction.

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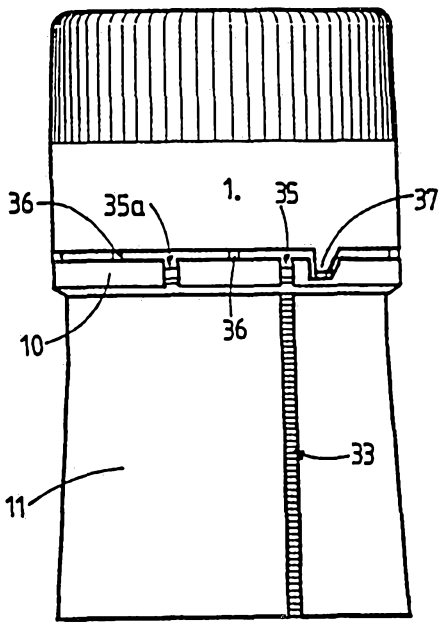

(57) Abstract

A cork with a rigid top (1) and a tear-off tamper-evident portion (10, 11). The removable portion (10, 11) is in the form of a skirt with an upper ring (10) and a lower tapering portion (11) which narrows towards the ring (10). Said ring (10) is connected to the cork top (1) by a tearable portion (17) and a generatrix of the skirt (11) is provided with a pull tab (33).

(57) Abrégé

Il comporte une tête (1) rigide et une partie de garantie déchirable (10, 11). La partie séparable (10, 11) se présente sous la forme d'une jupe présentant une bague supérieure (10) et une portion tronconique (11) inférieure allant en se rétrécissant en direction de la bague (10). Cette bague (10) est reliée à la tête (1) du bouchon par une zone déchirable (17) et une génératrice de la jupe (11) est munie d'une amorce de déchirure (33).

SAFETY CLOSURE

The present invention has for its object a safety closure of plastic material, which is to say a closure which will not permit the opening of the receptacle that it closes without this opening being made visible, for example, by tearing or the separation of a portion of this closure.

The present invention relates more particularly, but not exclusively, to a safety closure adapted to close wine bottles.

Traditionally, wine bottles are closed by corks, then wrapped, these wrappings totally enclosing the top of the bottle and extending for several centimeters along the neck of the bottle. These wrappings are generally of colored tin or provided with inscriptions or decorations.

Good quality cork becoming more and more scarce and more and more expensive, metal screw closures have been provided for bottles of wine. These closures comprise a ring of low height, two to three millimeters, pinched in below the rim on the neck of the bottle and a pre-weakened rupture line permitting separating this ring of the closure during its unscrewing, thus ensuring the safety function. These metallic closures comprise a sealing joint of plastic material or cardboard covered with a metal sheet, generally of aluminium and giving, as a closure, complete satisfaction at least for white wines.

These metallic closures nevertheless have substantial drawbacks which are:

- not giving to the closed bottle the appearance of a traditional bottle whose neck is covered by wrapping for three to four centimetres.

- complicating or even preventing the recycling of empty bottles because the metallic ring which detaches from the closure during unscrewing remains on the neck of the bottle and can be removed only with great difficulty.

The objection of the present invention is the provision of a safety closure, particularly for the closure of wine bottles, permitting the replacement of cork and giving to the closed bottle the traditional appearance while avoiding during its opening leaving a part of the closure fixed to the neck of the bottle.

With the above object in view, the present invention provides a safety closure of moulded synthetic material, particularly for wine bottles comprising in combination a rigid head provided with an inside thread, a separable portion connected to the rigid head by a circular tea-off safety zone, the separable portion comprising an upper ring and a lower skirt, the skirt having a truncated conical form narrowing in the direction of the ring and a height greater than the one of the head, the separable portion comprising opening means for breaking said portion in a substantially longitudinal direction.

The accompanying drawing illustrates schematically and by way of example an embodiment of closure according to the present invention.

Figure 1 is an axial cross section of a first embodiment of closure in service position closing a bottle.

Figure 2 is an elevational view of the closure shown in Figure 1.

Figure 3 is an elevational view of the closure shown in Figures 1 and 2, its skirt being partially torn off.

Figures 4-6 are views similar to Figures 1-3 of a second embodiment of the closure.

Figs. 7 and 8 show a practical form of execution of the closure according to the invention.

Fig. 9 shows a variant of the closure of the skirt which is not provided with longitudinal tearing-off means.

Fig. 10 shows a variant of the closure comprising tearing-off means on the skirt.

Figs. 11 and 12 are detail views of skirt variants.

The safety closure for bottles with screw threads, and particularly for bottles of wine, as shown in Figs. 1-3, is injection formed from plastic material, generally food quality polyethylene.

This closure comprises a rigid head 1 which can be provided on its periphery with ribs or other formations facilitating its gripping and its rotation. The internal cylindrical surface of this head is provided adjacent its front surface 2, with a screw-thread 3 adapted to co-act with a screw-head 4 carried by the external surface of the neck 5 of the bottle. The internal surface of this head closely matches the external surface of the neck down to the lower edge of its cylindrical bulge 6.

The bottom of the head 1 receives a sealing joint 7 constituted by a ring of compressible plastic material covered on at least its exposed surface with a metallic sheet, generally a sheet of aluminium. The exposed surface of this sheet or these metallic sheets can be covered with a film of plastic material, on a metalized plastic sheet or a plastic sheet, generally a tinned plastic sheet, generally of PET. This joint 7 is maintained in position between the bottom of the head 1, whose thickness is

slightly greater at the center than at the periphery, and the screw-thread 3 of the head.

The internal surface of the bottom of the head can have a circular rib, of a diameter less than the internal diameter of the head, permitting in screwed service position to apply the joint forcibly against the neck of the bottle, this joint then matching the shape of the upper free surface of this neck.

The beginning of the screw-thread 3 constitutes an axial abutment defining the screwed position of the closure on the bottle, which axial abutment in the closed position comes into contact with the upper portion of the bulge 6 of the neck.

The distance separating the bottom of the head from the beginning of the screw-thread 3 corresponds to the thickness of the joint 7 in its compressed condition increased by the distance separating the frontal portion of the neck 5 with the upper portion of its bulge 6. When the closure is thus screwed down onto the neck, the joint 7 is sufficiently compressed and deformed to ensure complete sealing of the bottle.

In service position screwed on the neck 5 of a bottle, the lower edge 8 of the head 1 of the closure is located substantially in the plane containing the lower surface 9 of the cylindrical bulge 6 of the bottle.

The closure according to the invention also comprises a neck or skirt comprising an upper ring 10 of an internal diameter less than that of the flange 8 of the head 1, and thus less than the external diameter of the bulge 6 of the neck. This ring 10, generally a truncated conical shaped

opening in the direction of the head 1 of the closure is integral with a truncated conical wall 11 opening in the direction opposite to the head 1 of the closure. This truncated conical wall 11 closely matches the part of the neck 5 of the bottle located just below the bulge 6 and extends for two or three centimeters or more as needed, particularly for appearance.

The neck or skirt formed by the ring 10 and the truncated conical wall 11 is connected to the head 1 of the closure by a thin web or membrane 17 of plastic material of a thickness of about 0.2 to 0.4 mm, preferably 0.3 mm, while the rest of the skirt has a thickness of the order of 1 mm and the lower edge of the head 1 a thickness generally greater that 1 millimeter.

The skirt has on its periphery an opening 12 completely or partially sectioning at least the ring 10 and thus creating a tear line, which, as will be seen later, will permit separating the ring 10, and hence the safety skirt from the head of the closure.

On the same generatrix as the opening 12, the skirt has a decrease of its thickness to about 0.3 mm constituting a tear-line 13 extending over a distance less than the height of the skirt. This portion 13 of less thickness is followed, still on the same generatrix of the skirt, by a slot 14 constituting a total sectioning of the skirt to its lower open end.

The bottom of the skirt, or of the truncated conical wall 11, comprises a tear-tab 15 situated in immediate proximity to the slot 14. For a closure screwing on normally in a conical direction, this tear-tab 15 is lo-

cated to the left of the slot 14. It would be located on the other side of the slot 14 for a closure of opposite threading.

Generally, such a closure is produced by injection of plastic into a mold comprising a core having the shape of the neck of the bottle. It is therefore necessary to obtain demolding of the closure which will not involve tearing of the skirt, the skirt having a certain elasticity letting it stretch to clear the portion of greatest diameter of this core. This can be obtained if desired by demolding at a certain temperature permitting this stretching. However, such a solution is not satisfactory because it is then necessary during closure of the bottles that this skirt will stretch elastically to pass below the bulge 6 of the neck 5 and that it then shrinks to match closely this neck and that the ring 10 locks the closure on the bottle by bearing against the overall surface of the bulge 6. It is necessary that this emplacement of the closure takes place without tearing of the thin web or membrane 10 connecting the head 1 to the skirt.

To obtain sufficient radial elasticity of the skirt, the latter comprises over all or a portion of its height at least two or three, but preferably six or more, longitudinal regions 16 of a thickness reduced to about 0.3-0.4 mm. The external surface of the skirt is smooth, while its internal surface is thus channeled. These channelings are, however, invisible from outside the closure, the pigmentation and the coloration of the plastic material being sufficient.

Thus, thanks to these channels or portions of reduced thickness of the skirt, there is conferred on the latter the radial elasticity sufficient that it can expand, and particularly such that the ring 10 expands during emplacement of the closure on a bottle without the film or membrane connecting the ring 10 to the edge 8 of the head 10 becoming damaged. Moreover it is not possible simply to decrease uniformly the thickness of the skirt to confer the necessary radial elasticity because, to separate the closure from the core during fabrication, it is necessary not only to pull on the head, but also to push the skirt by its lower portion to prevent it from separating from the head. This skirt must thus have high rigidity in the axial direction.

To obtain the necessary elasticity of the skirt, given the material used and the difference in diameter between the external surface of the bulge 6 and of the adjacent portion of the neck of the bottle, one can change the number and size of these zones of reduced thickness 16. To obtain the same elasticity, the greater the number of zones 16, the more their width should be reduced, and vice versa.

To emplace the closure on the bottle, the closure is axially fitted over the neck of the bottle until the bulge 6 of the bottle snaps over the ring 10 of the closure and the screw threads of the bottle and of the closure touch, then the closure is screwed on, which compresses the joint 7 and therefore effects the hermetic seal of the bottle and simultaneously the retraction of the ring 10 below the enlargement 6 of the neck preventing any unscrewing of the

closure without damaging it.

This closure thus permits effecting sealed closing of the bottle, guaranteeing its integrity because it is not possible to remove the closure without damaging it. Moreover, this closure of plastic material is hygienic and advantageously replaces cork even as to the organoleptic qualities of the wine. Finally, thanks to the skirt 10, 11, the external appearance of the closed bottle is that of a traditional bottle.

To remove the closure, it suffices to pull on the tab 15 effecting the rupture of the skirt along the slot 14 and beginning the rupture 13, then the separation of the skirt from the head by tearing off the membrane connecting the ring 10 to the head 1.

It will be noted that upon pulling on the tab 15 to effect the separation of the skirt from the head, the closure is not unscrewed, on the contrary it is screwed on more tightly.

Then, the skirt being separated from the head, the closure can be unscrewed and of course re-screwed for closing the bottle temporarily if necessary.

This closure therefore has also the advantages of leaving nothing about the neck upon opening, the skirt being torn off and separated from the closure and from the bottle which permits recycling of this bottle. Finally , the head of the closure can be used to re-close the bottle.

The plastic material of the closure can, of course be tinted throughout its thickness white or red as conventional tin closures. These closures can also be printed,

by serigraphy or typography, so to impart thereto decoration or the name of the proprietor or of the wine dealer.

This closure therefore provides for the first time an ecologically sound alternative, a good appearance to the bottle, and organoleptic similarity to conventional corks and tin caps.

In a modification, the head of the closure needs not have screw-threads and could be used with bottles having no screw-threads. The maintenance of the closure on the bottle is then ensured only by the ring 10 which during closure is emplaced below the bulge 6 of the bottle.

Figs. 4-6 show a second embodiment of closure according to the invention. In this embodiment the closure again comprises the head 1 whose bottom 2 is provided with a joint 7 and whose internal wall is provided with threading 3. This head 1 is connected to a detachable portion constituted by a ring 10 and a skirt 11, both truncated conical but in opposite directions as in the first embodiment.

In this second embodiment, the tearable zone connecting the head 1 to the tear off portion 10, 11 is constituted either by a perforated zone, or by bridges 20 connecting the ring 10 to a collarette 21 in the groove with the ring 10 and of the same external diameter as the lower portion of head 1.

Thanks to this tear-off region formed by perforations or bridges 20, the head 1 of the closure can be separated from the rest by unscrewing, giving rise to breakage of the bridges 20.

In this embodiment, the tear tab 15 is situated between two points to begin tearing constituted each by an

opening 22 at least partially dividing the ring 10, a zone of lesser thickness 23 aligned along the generatrix comprising the corresponding opening 22, zone 23 ending in a slot 24.

In this embodiment, the internal walls of the skirt 11 and of the ring 10 are smooth and of substantially constant thickness. The radial elasticity of the ring 10 of the skirt 11 necessary to demold the closure during its fabrication and to emplace it thereafter on a bottle is obtained in this case only by the two beginning points of tearing 22, 23, 24 disposed on each side of the tab 15.

The inclination of the internal surface of the ring 10 is such that the axial force necessary to begin its elastic removal is greater than the force at which the bridges 20 rupture. Thus, the closure is indeed a safety closure, its opening no matter how effected by unscrewing the head 10 and rupture of the bridges 20 or by tearing the tab 15 and separation of the skirt and of the ring from the head, provoking in any case a separation beteen its skirt and its head.

This embodiment of closure has the advantage of permitting its opening in two ways and still permitting the removal of the skirt from the bottle neck without a tool, by simple tearing off of the tab 15.

In a modification, the zones of least thickness 23 of the beginning point of tearing of the skirt can comprise perforations. Generally the resistance to tearing of the zone of least thickness of the beginning point of rupture increases upwardly from the skirt to the ring. This permits obtaining both easy tearing off of the tab to open

the skirt and good securement of the closure on the neck of a bottle immediately after its emplacement.

It will be evident that according to the elasticity of the plastic material used for the production of the closure, and if the zones 23 do not suffice to give the pre-requisite radial elasticity, local thinning of the skirt 11 and of the ring 10 can be provided as in the first embodiment described above.

It will be evident that these local thinnings of the skirt 11 and/or of the ring 10 could open not only as shown on the internal surface of the skirt, but on the external surface thereof.

In a modification, there could be provided in a manner known per se one or several driving formations integral with the head connecting with openings in the skirt. Each drive formation and its corresponding opening has a straight driving side, extending approximately along a generatrix of the closure and an oblique side, forming an angle relative to a generatrix of the closure.

Figs. 7 and 8 show the practical embodiment of the closure according to the invention comprising a rigid head 30 connected to a separable portion 31 by a tear-off safety zone 32. The separable portion is formed as described above by the skirt having a ring 10 and a lower portion 11. The separable portion 31 comprises also a tab 15 for opening said skirt connected to the skirt by points of beginning tear provided with pre-perforations 33 terminating in the direction of the ring 10 by a thicker plane portion 34. The ring 10 itself is interrupted from

35a in the direction of these beginning points of rupture.

The connection between the head 30 and the skirt 31 is effected by separate bridges 36 constituting the tear off safety zone.

In this embodiment, there will be seen the formations for driving and the rotation of the skirt 31 by the head, for its screwing onto a bottle; corresponding male formations 37 and female formations 38 comprising respective portions of the head and of the skirt.

Otherwise this embodiment comprises the same principal characteristics as described with respect to the preceding embodiments.

In the modification, the sealing joint 7 placed at the bottom of the rigid head 30 comprises one or several perforations of small diameter disposed in a central region having a diameter of about 14 mm of the joint. These perforations are such as to prevent outflow of liquid contained in the bottle but permit gas exchange, of air or oxygen, by passage between the contents of the bottle and the exterior on the one hand through these perforations and then by diffusion through the material of the bottom of the head 30. This is particularly useful for the bottling of red wines whose long-life organoleptic properties must still evolve after bottling by slow and controlled contact with the ambient air outside the closed bottle, as is the case with corks.

In the case where the bottles are recuperated, cleaned and prepared for their filling automatically it is possible to provide a working station having a tool enabling to cut or take off the skirt of the closure which remains

on the collar of the bottle. In such cases it is no more necessary for said skirt to be provided with longitudinal tearing off means or beginning of rupture nor with a tag.

Then in a variant the safety plastic closure according to the invention, for wine bottles particularly, comprises in combination a rigid head connected to a removable portion through a safety or guarantee tearing off zone. This separable portion has the shape of a skirt having an upper ring and a lower truncated conical position of a height which is greater than the one of the head, the said tearing off zone connecting said head to said ring. It is evident that in this variant the skirt and the ring forming the part, separable from the head of the closure, can show all the particular characters, lenght, shape and inside notches etc. as described previously except for the longitudinal tearing off means at point of rupture and for the tag.

In all embodiments of the closure the height of the truncated conical skirt is always greater than the height of the head of the closure.

In another variant of the closure it can be provided, as in the first embodiment, with a skirt having a longitudinal tearing off means or beginning of rupture, but the lug 15 would be cancelled improving the esthetical outlook of the closure.

In this case, the tearing-off means comprise an opening 35, as in the embodiment of figure 7, cutting the ring 10 and a preperforated line 33 extending along the whole length of the skirt 11.

In a variant shown at figure 11, the closure shown at figure 10 has a slot 40 near the preperforated line 33 determining with it a pseudo-lug permitting the manual tearing off of the skirt by rupture along said preperforated line 33.

In another variant the pre-cut could be constituated only by a slot 40 the remaining of the skirt being plain and smooth outside as inside.

Figure 12 show a variant of the skirt 11 of the closure in which the pre-cut is constituated by a V shaped groove opening on the internal surface of the skirt. This pre-cut is invisible from the outside of the skirt and increases the outlook of the closure.

Practice has shown that when the thickness of the skirt is of the order of 0,3 to 0,6 mm it is not necessary to provide for inside longitudinal grooves or ribes, the resiliency of the skirt, even without pre-cut and without grooves, being sufficient to set the closure on a bottle.

In all these embodiments when the skirt 11 has a pre-cut, or when said skirt is thin enough, i.e. of the thickness less than 0,8 mm, it is possible, after having unscrewed and removed the head of the closure, to separate the skirt from the bottle either manually or automatically through a relative axial displacement of this skirt with respect to the bottle towards the bottom of the bottle.

In fact, due to the presence of the ring 10 which is rigid, it is possible by means of a tubular tool slid over the neck of the bottle and resting against this ring 10 to cause a relative axial displacement of the skirt with respect to the bottle. As the diameter of the bottle in-

creases from its neck towards its body, the relative displacement cause the splitting, the opening or the tearing off of the skirt which can then easily be separated from the bottle. Such a tubular tool can be actuated manually or automatically in a working station of a bottle washing installation. To facilitate the opening of the skirt, it can have a pre-cut such as above described or simply a slot or opening in a small length merging out on its lower edge, for example on the slot 40 (figure 11).

Finally, it has to be mentioned that such a closure which weight about 5,5 gr. shows an ecological and energetical balance which is extremely favorable, up to ten times better than a conventional closure made of aluminium of the type of Alu (W-Welt) for example. Tests made by BASF AG Kunstoffe und Umwelt, Dr. K-H Feuerherd, 10.02.93 have indicated the following comparative values for the closure according to the invention (LD-PE) and to aluminium closure marketed under the name of Alu (W-Welt).

for 1000 pieces	LD-PE	Alu (W-Welt)
Energy MJ	260,70	479,36
air dam^3	1'271,51	11'335,68
water dm^3	590,15	1'792,84
Storage cm^3	1'610,40	5'328,12

In all embodiments the closure comprises a head screwed on a neck of a bottle, connected by a safety zone which is tearable of a skirt. This skirt comprises a rigid ring connected to the head of the tearing-off zone and a

trunko-conical portion fitting the neck of the bottle and having a height greater than the one of the head. This skirt may be separated from the neck of the bottle, after having unscrewed the head, either manually or by means of a tool permitting the skirt to slide along the neck of the bottle downwardly and causing the splitting of the skirt by an increase of its diameter. The skirt comprises preferably a pre-cut which in its simplest realisation can be made as a slot or an opening in its wall having a small length and merging on its lower edge. It is also possible to have two neighbour slots to create a tearing-off tag.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Safety closure of moulded synthetic material, particularly for wine bottles comprising in combination a rigid head provided with an inside thread, a separable portion connected to the rigid head by a circular tear-off safety zone, the separable portion comprising an upper ring and a lower skirt, the skirt having a truncated conical form narrowing in the direction of the ring and a height greater than the one of the head, the separable portion comprising opening means for breaking said portion in a substantially longitudinal direction.

2. Closure according to claim 1, wherein the thread of the head is adjacent to its bottom and by the fact that a sealing joint is disposed at the bottom of the head, which joint is formed by a circle of deformable synthetic material covered on its exposed surface with at least one metallic sheet or with one metallised plastic sheet or with a sheet of plastic material.

3. Closure according to claim 1 or claim 2 wherein the skirt comprises as opening means at least one rupture start or tearing off start.

4. Closure according to claim 3, wherein the rupture start of the skirt comprises, aligned along a generatrix of the latter, an opening dividing the ring, a portion of reduced thickness and slot extending to the open end of the skirt.

5. Closure according to claim 3 or claim 4, wherein said closure comprises a tear-tab situated immediately adjacent to the rupture start of the skirt and extending beyond its lower end.

6. Closure according to claim 5, wherein said closure comprises on each side of the tear-tab a rupture start.

7. Closure according to any one of claims 3 to 6, wherein the rupture start or

starts comprise, aligned along a generatrix of the skirt, an opening dividing the ring, a region of reduced thickness and pre-perforation, and a slot extending to the opened end of the skirt.

8. Closure according to any one of claims 1 to 7, wherein the tear zone is constituted by a membrane.

9. Closure according to any one of claims 1 to 7, wherein the tear zone is constituted by a circular pre-perforated zone.

10. Closure according to any one of claims 1 to 7, wherein the tear zone is constituted by separate bridges distributed about the circumference of this zone and connecting the head to the skirt.

11. Closure according to any one of the preceding claims, wherein the skirt comprises axial regions of less thickness of which the width and the number are defined as a function of the required radial elasticity of the skirt.

12. Closure according to claim 11, wherein the thickness of the skirt is comprised between 0.8 and 1.2 mm, while the regions of lesser thickness of the skirt are of the order of 0.2 to 0.4 mm as is the rupture start and the membrane connecting the ring to the head.

13. Closure according to any one of the preceding claims, wherein the skirt has a length greater than 2 cm, preferably between 3 and 4 cm.

14. Closure according to any one of the preceding claims, wherein said closure is of food quality polyethylene tinted throughout.

15. Closure according to any ane of the preceding claims, wherein said closure is provided with inscriptions or decorations on its outer surface.

16. Closure according to any one of the preceding claims, wherein the head of said closure comprises formations facilitating its grasping and its rotation.

17. Closure according to any one of the preceding claims, wherein the smallest internal diameter of said closure is located at the junction of the ring and of the cylindrical wall of the skirt.

18. Closure according to claim 17, wherein the ring is truncated conical expanding in the direction of the head of the closure.

19. Closure according to any one of the preceding claims, wherein the diameter of the intersection of the internal surfaces of the ring and of the skirt is of lesser external diameter than the bulge of a bottle being enclosed by this closure and by the fact that the radial elasticity of the skirt and of the ring permit the spreading of this minimum diameter permitting the passage of the enlargement during closing of the bottle.

20. Closure according to claim 2, wherein the metallic sheet, the metallised plastic sheet or the plastic sheet of the joint is covered with a film of synthetic PET material.

21. Closure according to any one of claims 3 to 7, wherein the region of reduced thickness of the rupture start has in its upper portion, adjacent to the ring, a plain portion of greater resistance than its lower portion.

22. Closure according to any one of claims 3 to 7 or 21, wherein the zone of reduced thickness of the rupture start has a progressive resistance to tearing from the slot towards the ring.

23. Closure according to any one of the preceding claims, wherein the internal surface of the head has a circular rib of a diameter less than the internal diameter of this head.

24. Closure according to any one of the preceding claims, wherein the lower edge of the head comprises at least one drive formation extending into an opening of the ring, this formation and this corresponding opening having a straight drive side extending approximately along a generatrix of the closure and an oblique side forming an angle with respect to a generatrix of the closure.

25. Closure according to any one of claims 2 to 24, wherein the sealing joint placed at the bottom of the head comprises one or more perforations in its central zone whose diameter is such that the liquid contained within the bottle cannot escape but permitting the passage of a gas, particularly air or oxygen.

26. Closure as claimed in claim 3, wherein the rupture start extends substantially along a generating line of the skirt.

27. Closure according to claim 26, wherein the rupture start comprises an opening cutting the ring as well as the tearing-off line formed by a linear zone of smaller thickness of the skirt.

28. Closure as claimed in claim 26, wherein the rupture start comprises an opening cutting the ring and a preperforated line along the skirt.

29. Closure according to claim 27, wherein the thinned zone of the skirt is made by a V shaped groove opening on the inside wall of the skirt.

30. Closure according to any one of claims 1, 2 or 3, wherein the ring of the skirt is sufficiently thick and rigid to act as an abutment used as a rest to cause an axial displacement of the skirt along the bottle towards its bottom causing thus the opening of the skirt and its separation from the bottle.

31. Closure according to claim 30 wherein the thickness of the skirt is less than 0.7 mm and this it has an internal smooth wall.

32. Closure as claimed in cliam 31, wherein the outside wall of the skirt is smooth except for its zone of rupture.

33. Closure as claimed in any one of the claims 30, 31 or 32, wherein the skirt has at least one slot or cut of small length opening on its lower edge and serving as rupture start.

DATED this 17th day of March, 1995

ERNST HERRMANN

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ABSTRACT OF DISCLOSURE

The invention relates to a closure for wine bottles in particular which comprise a rigid head 1 and a tear-off safety portion 10,11. The tear-off portion 10,11 is in the form of a skirt having an upper ring 10 and a lower truncated conical portion 11 narrowing in the direction of the ring 10. This ring 10 is connected to the head 1 of the closure by a tear-off zone 17 and a generatrix of the skirt 11 is provided with tearing off means 33.

34906/93

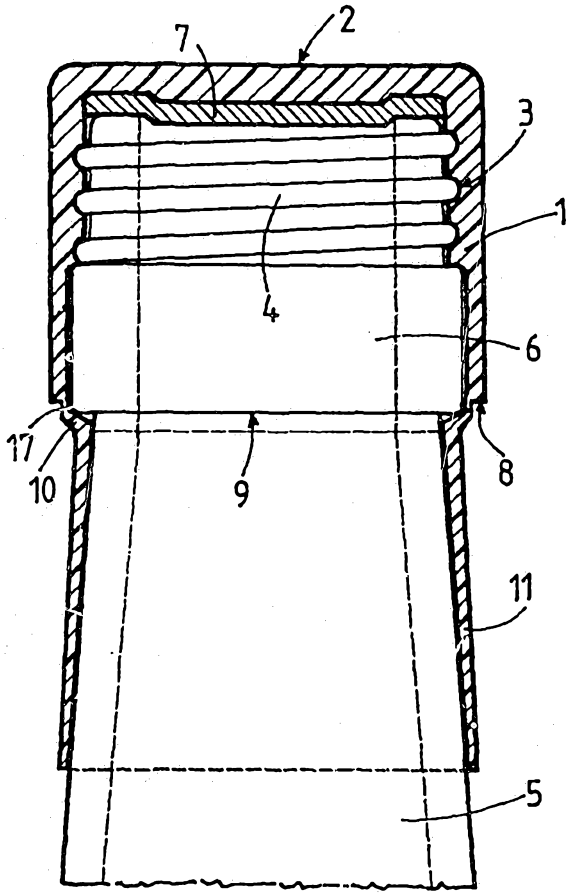


FIG. 1

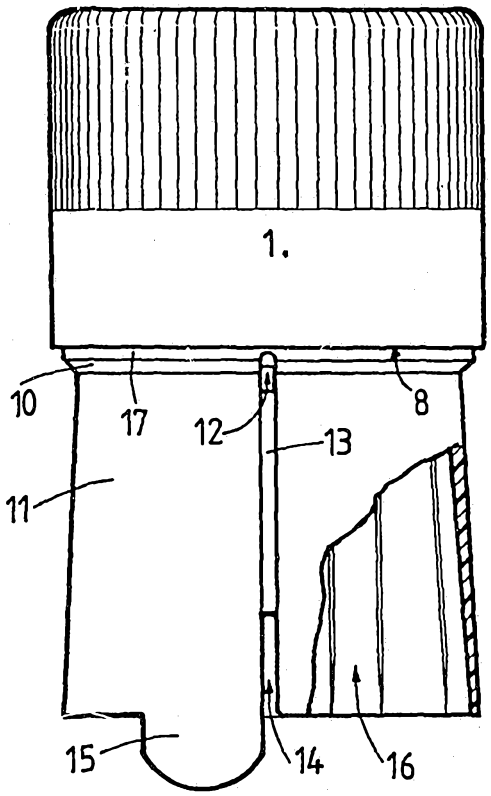


FIG. 2

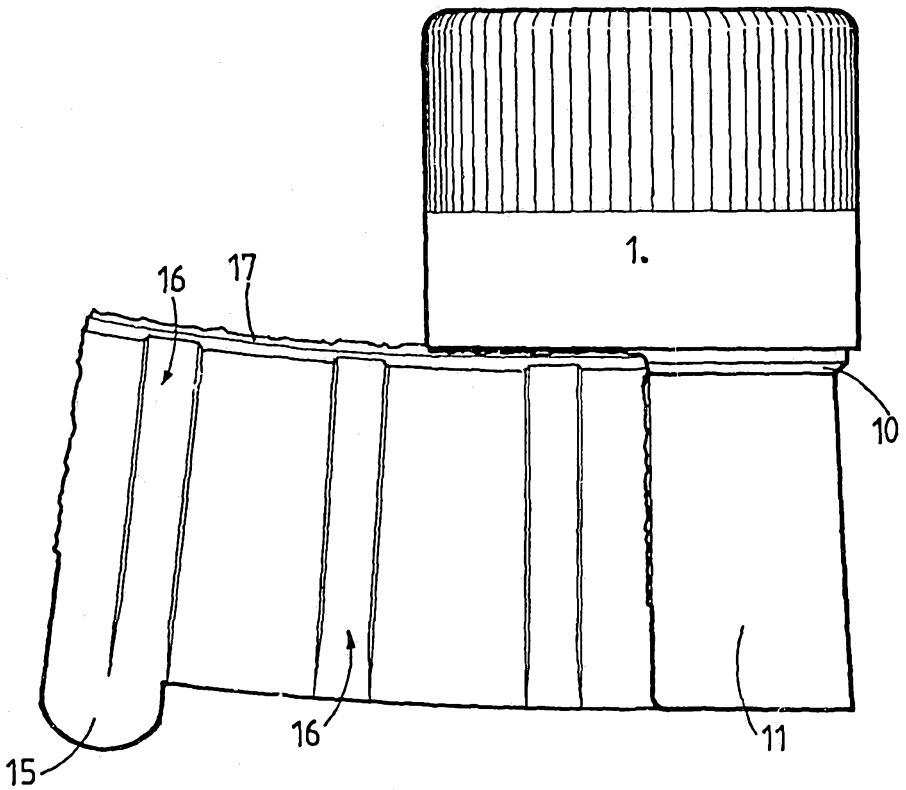


FIG. 3

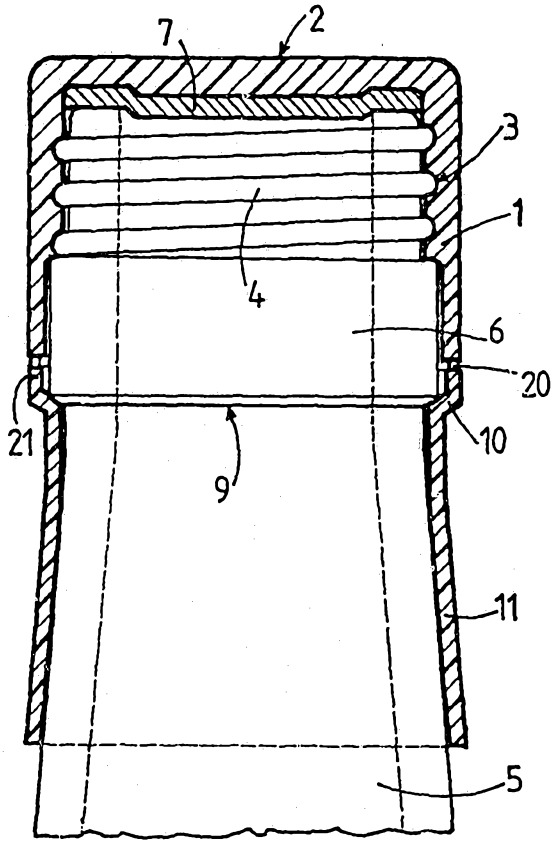
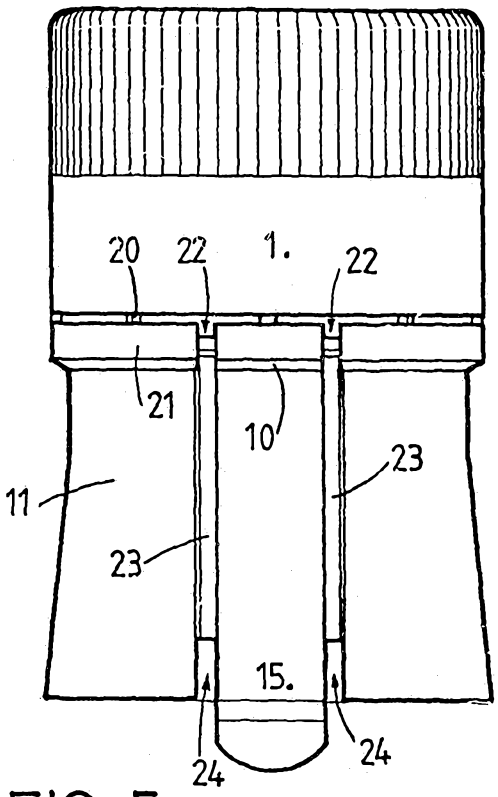


FIG. 4



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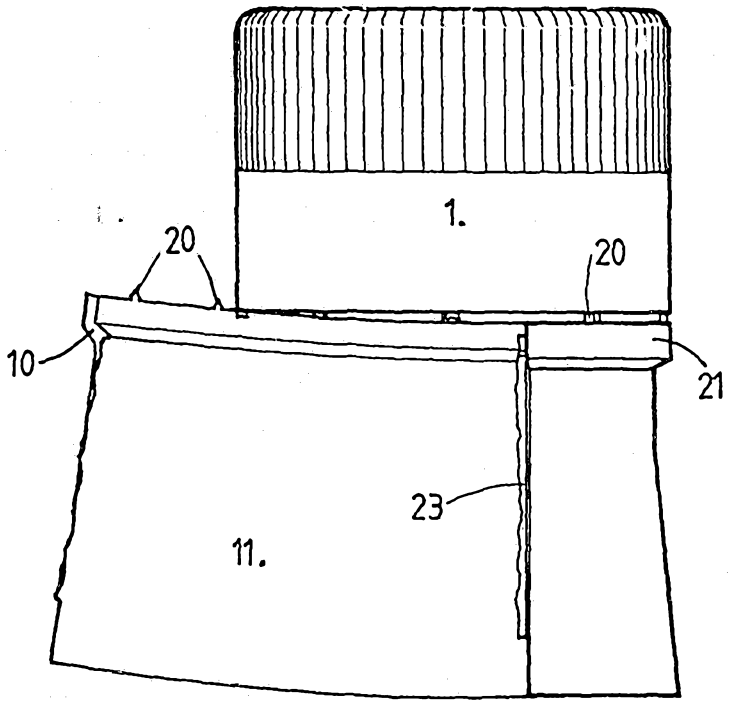

FIG. 6

FIG. 7

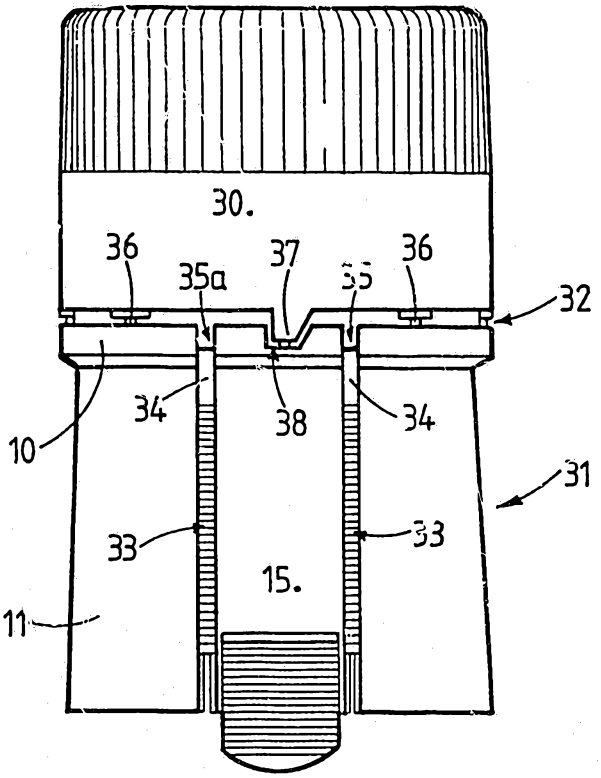
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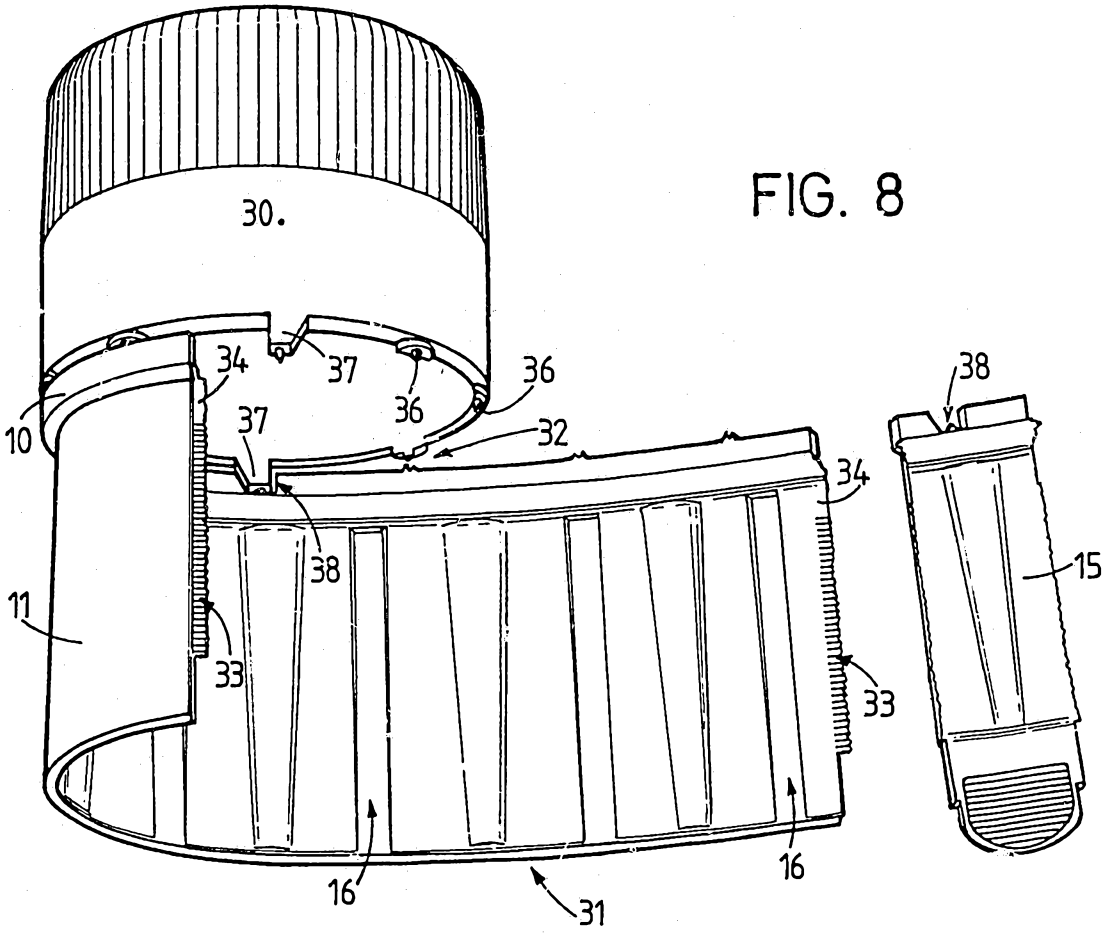
FIG. 8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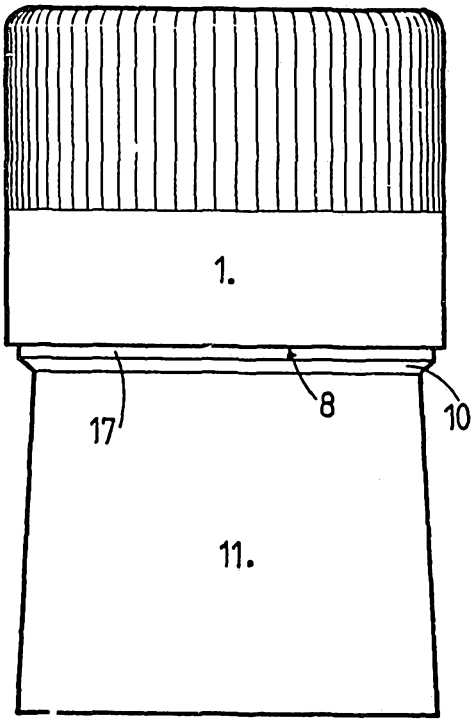

FIG. 9

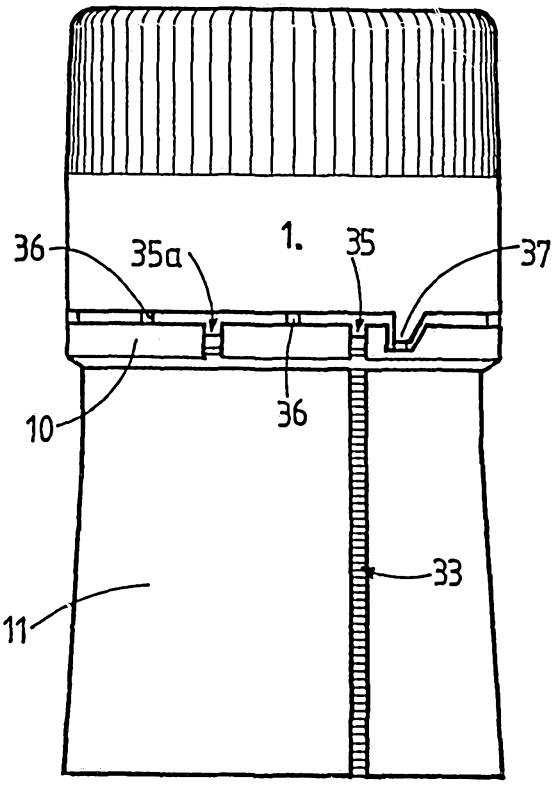

FIG. 10

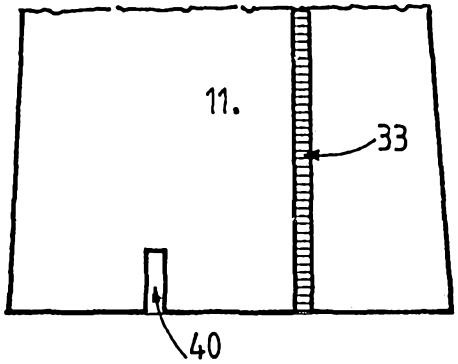

FIG. 11

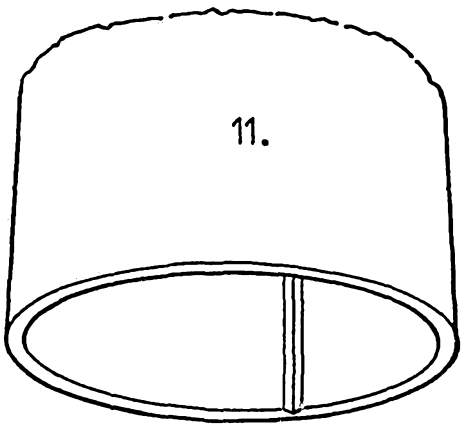

FIG. 12

INTERNATIONAL SEARCH REPORT

International application No
PCT/CH 93/00051

A CLASSIFICATION OF SUBJECT MATTER

Int. Cl.[5] B65D41/34

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)

Int. Cl.[5] B65D

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,4 474 302 (J.R. GOLDBERG) 2 October 1984 see column 3, line 4 - column 6, line 34; figures 1-4	1-9, 14-19, 26-33
A	AU,D,1 546 676 (G. GRAMP) 5 January 1978 see the whole document	1-9, 14-19, 21-24, 26-33
A	EP,A,0 395 212 (CAP SNAP CO.) 31 October 1990 see column 4, line 41 - column 6, line 28; figure 1	1-9, 14-19, 21-24, 26-33

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☐ Further documents are listed in the continuation of Box C ☐ See patent family annex.

* 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 document 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	Date of mailing of the international search report
18 May 1993 (18.05.93)	1 June 1993 (01.06.93)

Name and mailing address of the ISA	Authorized officer
EUROPEAN PATENT OFFICE	
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

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

CH 9300051
SA 70614

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 18/05/93

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A-4474302	02-10-84	AU-A-	3471784	09-05-85
		EP-A-	0141611	15-05-85
AU-D-1546676	05-01-78	None		
EP-A-0395212	31-10-90	US-A-	4911316	27-03-90
		CA-A-	2011600	27-10-90
		JP-A-	3029756	07-02-91
FR-A-1462219		DE-A-	1532475	15-01-70
		GB-A-	1140840	
		NL-A-	6609007	30-12-66
BE-A-556849		None		
US-A-4666052	19-05-87	CA-A-	1280717	26-02-91
DE-A-1482594	09-01-69	None		

RAPPORT DE RECHERCHE INTERNATIONALE

Demande Internationale No PCT/CH 93/00051

I. CLASSEMENT DE L'INVENTION (si plusieurs symboles de classification sont applicables, les indiquer tous) [7]

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

CIB 5 B65D41/34

II. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE

Documentation minimale consultée[8]

Système de classification	Symboles de classification
CIB 5	B65D

Documentation consultée autre que la documentation minimale dans la mesure où de tels documents font partie des domaines sur lesquels la recherche a porté[9]

III. DOCUMENTS CONSIDERES COMME PERTINENTS[10]

Catégorie °	Identification des documents cités, avec indication, si nécessaire, des passages pertinents [12] [13]	No. des revendications visées [14]
A	US,A,4 474 302 (J.R. GOLDBERG) 2 Octobre 1984 voir colonne 3, ligne 4 - colonne 6, ligne 34; figures 1-4	1-9, 14-19, 26-33
A	AU,D,i 546 676 (G. GRAMP) 5 Janvier 1978 voir le document en entier	1-9, 14-19, 21-24, 26-33
A	EP,A,0 395 212 (CAP SNAP CO.) 31 Octobre 1990 voir colonne 4, ligne 41 - colonne 6, ligne 28; figure 1	1-9, 14-19, 21-24, 26-33

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° Catégories spéciales de documents cités:[11]

"A" document définissant l'état général de la technique, non considéré comme particulièrement pertinent

"E" document antérieur, mais publié à la date de dépôt international ou après cette date

"L" document pouvant jeter un doute sur une revendication de priorité ou cité pour déterminer la date de publication d'une autre citation ou pour une raison spéciale (telle qu'indiquée)

"O" document se référant à une divulgation orale, à un usage, à une exposition ou tous autres moyens

"P" document publié avant la date de dépôt international, mais postérieurement à la date de priorité revendiquée

"T" document ultérieur publié postérieurement à la date de dépôt international ou à la date de priorité et n'appartenant pas à l'état de la technique pertinent, mais cité pour comprendre le principe ou la théorie constituant la base de l'invention

"X" document particulièrement pertinent; l'invention revendiquée ne peut être considérée comme nouvelle ou comme impliquant une activité inventive

"Y" document particulièrement pertinent; l'invention revendiquée ne peut être considérée comme impliquant une activité inventive lorsque le document est associé à un ou plusieurs autres documents de même nature, cette combinaison étant évidente pour une personne du métier.

"&" document qui fait partie de la même famille de brevets

IV. CERTIFICATION

Date à laquelle la recherche internationale a été effectivement achevée	Date d'expédition du présent rapport de recherche internationale
18 MAI 1993	01-06-1993
Administration chargée de la recherche internationale	**Signature du fonctionnaire autorisé**
OFFICE EUROPEEN DES BREVETS	PERNICE C.

ANNEXE AU RAPPORT DE RECHERCHE INTERNATIONALE RELATIF A LA DEMANDE INTERNATIONALE NO.

CH 9300051
SA 70614

La présente annexe indique les membres de la famille de brevets relatifs aux documents brevets cités dans le rapport de recherche internationale visé ci-dessus.
Lesdits membres sont contenus au fichier informatique de l'Office européen des brevets à la date du 18/05/93
Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office européen des brevets.

Document brevet cité au rapport de recherche	Date de publication	Membre(s) de la famille de brevet(s)		Date de publication
US-A-4474302	02-10-84	AU-A-	3471784	09-05-85
		EP-A-	0141611	15-05-85
AU-D-1546676	05-01-78	Aucun		
EP-A-0395212	31-10-90	US-A-	4911316	27-03-90
		CA-A-	2011600	27-10-90
		JP-A-	3029756	07-02-91
FR-A-1462219		DE-A-	1532475	15-01-70
		GB-A-	1140840	
		NL-A-	6609007	30-12-66
BE-A-556849		Aucun		
US-A-4666052	19-05-87	CA-A-	1280717	26-02-91
DE-A-1482594	09-01-69	Aucun		

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