Fig. 1

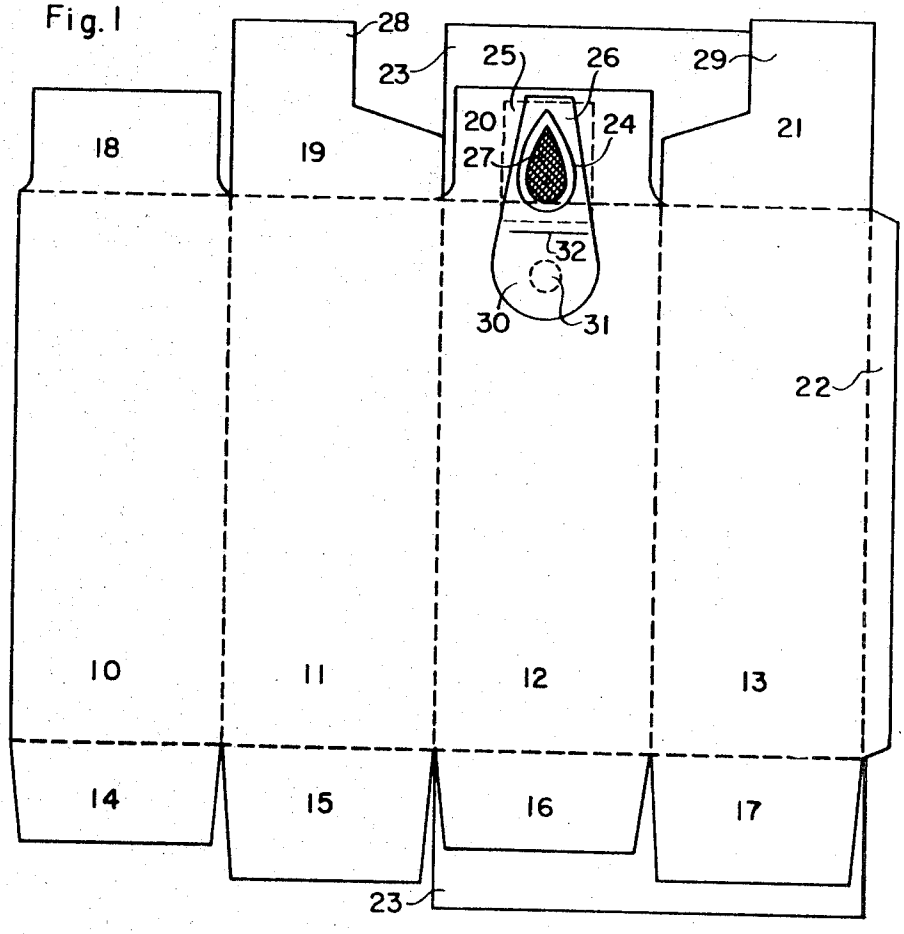
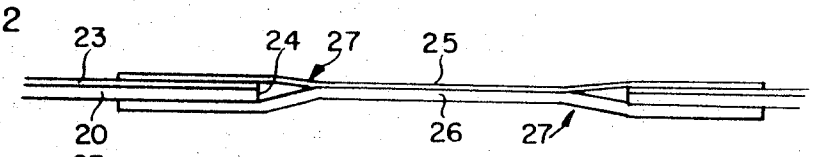


Fig. 2



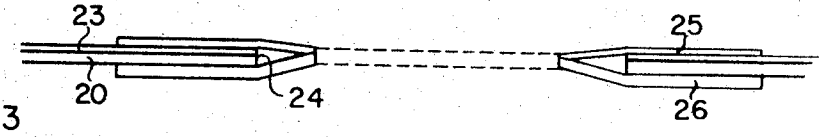


Fig. 3

United States Patent

[11] 3,613,986

[72] Inventor **Od Wikar Christensson**
Stockholm, Sweden

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[73] Assignee **CEKA Packaging Limited**
Zurich, Switzerland
[32] Priority **Oct. 29, 1968**
[33] **Sweden**
[31] **14603/68**

[54] **ARRANGEMENT IN PACKAGES FOR LIQUIDS WITH POUR OPENING**
11 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** ..... **229/17 R,** 229/51 AS
[51] **Int. Cl.** **B65d 5/70**
[50] **Field of Search** ..... 229/17 R, 37 R, 51 AS, 7 R, 7 S, 51

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Primary Examiner—Donald F. Norton
Attorney—Larson, Taylor and Hinds

ABSTRACT: A tubular cardboard liquid container having a plastic liner. End flaps form a flat top and a flat bottom. On an innermost top flap is formed a pouring opening comprising a hole through the cardboard and the plastic liner and a pair of additional plastic layers, one on the inside of the opening and one on the outside of the opening, the two layers welded to each other at the opening. A grip tongue is provided for tearing away the parts of the two additional plastic layers which are welded together at the opening to form the pour opening.

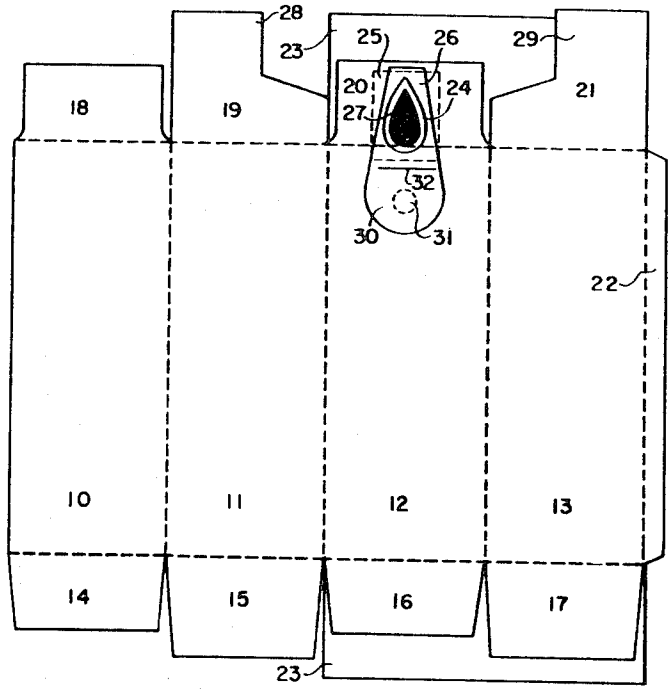
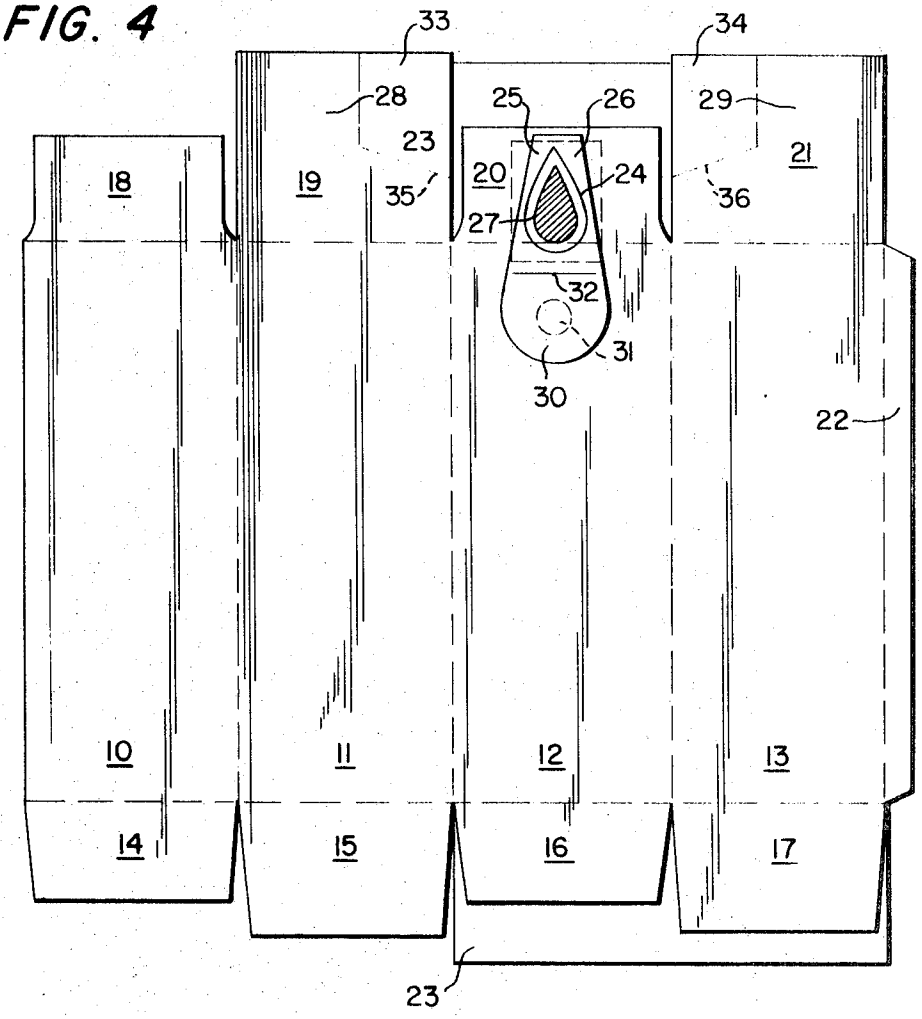


FIG. 4



INVENTOR
OD WIKAR CHRISTENSSON

BY Larson, Taylor and Hinds
ATTORNEYS

ARRANGEMENT IN PACKAGES FOR LIQUIDS WITH POUR OPENING

For several reasons one has long tried to find new types of packages for liquids, which have had for their purpose to replace the old glass bottles. Thereby, one has especially tried different kinds of packages of cardboard, which have been laminated with or provided with a liner of plastic. These packages, as a rule, must be provided with specific arrangements for their opening in order to pour out the packed liquid.

At present, one is clear about the demands to be put on a good package of the above-mentioned kind. The package must firstly be stable, secondly it must be tight, thirdly it must be pilable, fourthly it must be capable of being opened to top off the contents without splashing. To this, of course, is added that the package must be capable of being produced at a reasonable cost, and destroyed after use so that no unreasonably great store of nondestroyed packages are collected in nature.

Up to this time it has not been possible to produce a package, which, in an acceptable way, satisfied all of these demands. The invention, however, is based upon the idea that the type of package which has already been developed and won acknowledgement when used for powderformed products which should be packed airtightly and in many a case even vacuumtightly, could be especially suitable for satisfying the said demand. The difficulty thereby, rather has been in the provision of an opening arrangement for the package, which is easy to manipulate, which will not splash, which will not be damaged during transport, and which makes it possible to pour off the liquid stored in the package to its full extent.

According to this principle, the present invention is based upon a package of the type rectangular in cross section, which is provided with a stiffening part of cardboard or similar material and a tightening part in the form of a liner of plastic, eventually metallized plastic, whereby said liner is tube-formed and extends so much above the sides of the outer package, that it may be closed by even closing in a satisfactory way, and the outer package is provided at each end with closing flaps, which are bent down along so situated lines that they form together a flat closed surface, extending practically completely perpendicularly to the side surfaces of the package.

This kind of package is previously known. It has been used, for instance, to a very great extent for packing roasted and ground coffee under vacuum, and it has thereby proved to be tight also under the most difficult conditions, and also pilable, and finally also stable. If such a package is used in its normal state for storing liquids, it will, however, not fulfill said demands. It is difficult to open, when it is filled with a liquid, and it is practically impossible to open such a liquid filled package, without splashing.

It has already been proposed in other types of packages, which are provided with a liner, to cut out a tap off hole through the liner as well as through the stabilizing part, which has normally been made of cardboard, and to cover this hole by a piece of plastic on the interior side and a piece of plastic on the exterior side of package, and thereby to join the two pieces of plastic with each other within the range of the hole and with the inner side and the outer side of package within the range around said hole. The idea, thereby, has been that one should with a pointed subject, for instance a knife, a shank of a pair of scissors, a pricker or the like break through double plastic within the range of the hole, this way making possible a pouring of the liquid. Such an arrangement will perhaps function well in many cases, but it is definitely not suitable in other cases, for instance in a package for liquids, occuring within the household, such as milk, juices and the like. In the last-mentioned cases one will, as a matter of fact, be capable of pouring the contents in the form of a nonbubbling squirt, which means under simultaneous feed of air, and the opening should further be of sufficient magnitude and have rather even edges in order that the pouring out squirt should flow evenly. Neither one of these conditions are satisfied in the known opening arrangement. To this is added the fact that this opening arrangement cannot as a rule be placed in such a way on the package, the complete pouring of the contents of the package is made possible.

The present invention refers to an arrangement in packages for liquids of the kind, containing an outer package of cardboard or similar material, and an inner layer laminated thereto, or a free liner of an airtight material such as plastic or the like, said package being provided with four sides separated from each other by creasing lines, and at each end of each side a closing flap, arranged to be folded down onto the package after closing the liner.

According to the invention, a pour off arrangement is provided in one of the closing flaps, which, when closing the package, is situated most inwardly, and this pour off opening is so arranged, that it may be torn up by a light grip. The closing flap or flaps, respectively placed outside of the innermost closing flaps, thereby are provided with recesses of such a form, that the tap off opening is laid free or may easily be laid free. A hole for forming the tap off opening is cut through the closing flap of the outer package as well as through the plastic laminate layer of plastic liner belonging thereto, and this hole is inwardly as well as outwardly covered by a plastics layer, the inner plastic layer being attached by plastic welding or in similar way to the innerside of the package and within a limited part of the hole welded to the outer plastic layer, and the outer plastic layer being formed to a grip tongue for tearing up the welded together part of the two plastic layers.

According to a specifically advantageous form of execution of the invention, the hole is drop shaped with the pointed end turned onto the upper edge of the closing flap, and with the rounded end of a lapping creasing line, by means of which the closing flap is connected to the side pertaining thereto.

The invention will be further described below in connection with the attached drawing, which shows one form of execution of the invention. However, it is understood that the invention is not limited to this specific form of execution, but that all different kinds of modifications may occur within the frame of the invention.

In the drawing FIG. 1 shows the blank for a package of the kind here concerned, developed in the level, whereas FIGS. 2 and 3 show on an enlarged scale a section through the opening, first in FIG. 2 before it has been torn through, and secondly in FIG. 3 after it has been torn through. FIG. 4 shows a modification of the blank of FIG. 1.

The package, thus, in first place comprises a stiffening part which may be made from cardboard, and a tightening part, which is preferably made from plastic. The stiffening part is cut in the form, shown by lines drawn in full in FIG. 1, and is provided with creasing lines according to the dotted lines in FIG. 1. Thereby, thus, the four sides **10**, **11**, **12** and **13** are separated from each other as well as from the four lower closing flaps **14**, **15**, **16** and **17** and the four upper closing flaps **18**, **19**, **20** and **21**. The side **13**, situated in the drawing most at right is provided with a pasting flap **22** intended to be fasted to the inner side of the side piece **10** when the package is made up in a tube form squared in cross section. Further, the liner **23**, which is already tube formed in advance, is attached to the package, so that it will cover the inner sides of the four side pieces, when the package has been made up into tube form, squared in cross section.

The four closing flaps in the bottom are closed in the traditional way, which means that one will first turn the flaps **14** and **16** inwardly, so that their edges meet each other, and thereafter the two remaining flaps **15** and **17**, one before the other one, whereby the different flaps are attached to each other by pasting. Before folding in the flaps, of course, the extending part of the liner has in the traditional way been plained into a so-called plain closing, which has been welded together. The triangular ears thereby created are automatically folded in at the closing of the outer package. This closing procedure, of course, is known per se.

In one of the interior closing flaps of the upper end of a package, the closing flap **20**, a hole has been cut, going through the cardboard material as well as through the liner, and this was made already at the production of the package blank and the liner or at their combination with each other. This hole has been shown in the drawing to be drop formed, which is very advantageous form of the hole, but one may, of course, also use other forms; for instance the hole may be made rhombic with the greater diagonal turned in the vertical direction or the like. The edges of the hole are shown in FIGS. **1**, **2** and **3** at **24**. On the inner side of the package, a piece of plastic **25** is welded along the edges of the hole **24**, and on the outer side of the package a second piece of plastic **26** is welded to the edges of the hole. The two pieces of the plastic further are pressed onto each other and welded to each other within a surface, which has been marked in FIG. **1** by the line **27**. This kind of a sealing, which may be opened, is previously known although it has not earlier been used in connection with the kind of package here concerned, nor has it been placed in a place of the package where it should be placed according to the present invention. The intention with the earlier known closings of this kind, as a matter of fact, has been that one should stitch them through by some pointed object.

This is not the case at the present invention. Tests have proven that the surface situated inside of the line **27** in FIG. **1** or FIG. **2** respectively, has by the welding procedure got a tendency to show other rigidity properties than the parts situated between the lines **24** and **27**, and that for this reason it is possible to tear away both of the plastic layers **25** and **26** within the range inside of the line **27**, as if this line represents a perforation line. Especially obvious will this property be, if the tool used for the welding has a pattern, for instance a finely squared pattern or the like, at least on one side of the double plastic foil inside of the range **27**.

In order that the opening of the package shall take place in this way, firstly a surface inside of the line **27** but preferably also the surface inside of the line **24** and most preferably all of the surface about the outer plastics piece **26** should be available from outside. For this reason steps have been formed in the two closing flaps **19** and **21**. The steps are so placed, that they leave the surface of the plastic piece **26** uncovered at the closing of the package, whereas the extending tongue **28** and **29** give completely sufficient attachment for pasting the package tight.

As the intention of the earlier proposed arrangement was, that one should stitch through the plastic material surfaces welded to each other by means of a pointed object, it was also important, that both of these plastics layers should be well attached to the edges of the hole. In the arrangement according to the present invention, on the other hand, the part of the plastic layers representing the welding range shall be torn away by means of the outer plastic layer. In the present case it is therefore better, if the inner plastic layer certainly is well attached to the liner, but if the outer plastic layer is rather loosely attached to the side of the cardboard, for instance by means of some weak gluing or the like. It is even possible, considering the greater thickness of the outer plastic layer, as compared with the thickness of the inner plastic layer, to leave the outer plastic layer completely without any connection with the outer side of the cardboard.

Tearing off the outer layer and the part of the inner layer, following therewith, which is situated inside of the surrounding line **27**, takes place by means of a grip tongue **30**, which is formed in one piece with the outside situated plastic piece **26**. In order that the outside situated plastic piece shall not, when torn off, be torn apart along the edge **24** and the sealing should be unbroken, it is also important that the outer plastic piece **26** is essentially stronger than the inner plastic piece **25**, preferably by being made of a thicker plastic. This thick plastic, however, will not be sufficiently flexible to approach the side **12**, after the package has been closed, but it will show a given tendency to extend outside of the circumference of the package in the same plane as the one, in which the closing flaps **18**, **19**, **20** and **21** are situated. For preventing this disturbance of the rectangular form and the pilability, the tearing tongue **30** is compulsorily turned down along the side **12** and attached thereto by means of glue, paste, a lacquer or some other only weakly attaching medium within a point **31**. It has now proved, that depending on how quickly one releases the tearing off tongue **30** from the side **12**, it may certainly happen, that the release take place not only at the point **31**, but rather often, instead, the cardboard material splits itself up, and its surface layer will follow with the tearing off tongue. In order that such a splitting phenomenon shall not take place at an early state, so that the splitting shall not extend to the opening **24** or **27**, a cutting through **32** is arranged in the cardboard material. This may go completely through the cardboard, but it is more suitable, that it only runs for instance half way through the material of the cardboard.

In order that it shall be possible to empty the package completely it is also important that the opening **27** extends right to the creasing line between the side **12** and the closing flap **20**. The consequence hereof will be that the cut hole **24** should run over the creasing line down to a place within the range of the side **12**, as indicated in the drawing.

Another point of view, which should be observed regarding the placing of the opening **24** is that it should be situated in a place of the package, where the liner is single, that means not double folded or plurality folded. In the plain closing of the liner at the upper end of the package before the closing flaps are folded inwardly, the plain closing ridge should run from the middle of the side **11** to the middle of the side **13** and be folded down in a direction onto the closing flap **18**. If the package is square formed in cross section as shown in the form of execution, thereby, after the two plain closing ears have been folded inwardly, two diagonal limination lines are formed, limiting four fields, each of which being situated opposite to one of the closing flaps. Within the two fields, opposite to the closing flaps **19** and **21**, the liner is threefold and within the field, opposite to the closing flap **18**, the liner is certainly single, but it is in part covered by the plain closing ridge. Only within the field opposite to the closing flap **20**, the liner is single, and therefore the opening **24** has also been provided within this field.

It was mentioned above, that steps were arranged in the closing flaps **19** and **21** in order that the closing arrangement, amongst other containing the plastic piece **26**, should be accessible from outside. This, however, also causes that the damageable plastic in the opening is accessible in such a way, that it may be damaged involuntarily, and leakage may occur. According to a further form of execution of the invention, therefore, the steps are only marked by perforation lines, which makes it easy when opening the package first to tear off the part representing the step from one of the closing flaps **19** and **21**, and thereafter to tear up the tearing tongue **30** and to open the package. FIG. **4** shows the same blank for a package, as also shown in FIG. **1**, modified in accordance with the above. Thus, it is seen that the two closing flaps **19** and **21** are principally square-formed, and that the step is replaced by a perforation line **35** or **36**, respectively, so that the pieces **33** and **34**, respectively, of these two closing flaps can easily be torn away along the perforation lines. They will therefore, as long as the package is tight and nontouched, cover the opening inside of the two lines **24** and **27** and protect the plastic from damage, but they can easily be torn away, and thereafter the package will have identically the form, which will be the consequence of the use of a blank according to FIG. **1**. Of course, when closing a package according to FIG. **4**, the remaining parts of the two closing flaps **19** and **21** should be pasted to the flaps below them, but the parts **33** and **34** of these two closing flaps should be without any glue or paste.

In the form of execution of the package according to the present invention, shown in the figure, the closing flaps **19** and **21** are so high, that they practically completely extend to the creasing line of the other one of said flaps. In such a case, of course, one should only provide perforations and a possibility

of tearing away a part for providing a step in the one closing flap, but the other closing flap should already from the beginning have part of it cut away for providing the step.

The drop form of the opening inside of the line 24 is very advantageous. It makes it possible to get a strong, well-rounded pouring squirt from the lower, broader part of the opening, whereas air may without any difficulty enter through the upper, pointed part of the opening. The upper end of the opening further should also be pointed for the reason, that thereby a natural end for the tearing off is obtained so that there will be no tendency for the tearing to continue outside of the line 27.

I claim:

1. An arrangement in packages for liquid of the type containing an outer package of cardboard and an inner airtight plastic liner, said package being provided with four sides separated from each other by creasing lines, and at each end of each side a closing flap arranged to be folded down flat onto the package after the closing of the liner to form two flat ends of the package a pour opening in one of said flat closing flaps which, when the package ends are closed, is situated innermost, the closing flaps situated outside of the said one flap being of such a form that the pour opening will be accessible, said pour opening comprising a hole cut through the said one closing flap as well as through the plastic liner adjacent thereto, said hole on its inside as well as on its outside being covered by a layer of plastic, the inner plastic layer being attached to the inner side of the package and also within a limited part of the hole being attached to the outer plastic layer, and the outer plastic layer being formed to include a gripping tongue for tearing away the parts of the two plastic layers which are attached to each other within the said opening.

2. An arrangement according to claim 1 in which the hole is drop-shaped with the pointed end turned to the side of the said one closing flap farthest from the side of the package adjacent thereto and with the rounded end overlapping the creasing line between the said one flap and the adjacent side of the package.

3. An arrangement according to claim 2 in which steps are arranged in the outermost closing flaps to expose the said one flap containing the pour opening when the package is closed.

4. An arrangement according to claim 1 in which perforations are arranged in the outer flaps such that when the package end is closed and the outer flaps are torn at the perforation lines, the said one flap is exposed.

5. An arrangement according to claim 1 in which the said inner plastic layer is made of a mechanically less rigid material than the outer plastic layer.

6. An arrangement according to claim 1 in which the grip tongue is folded down against the adjacent side of the package and attached to the side by an attaching means at a spot on the side, which spot may easily be dissolved by mechanical influence.

7. An arrangement according to claim 6 in which a cut is made at least partially through the cardboard material between the said spot and the creasing line between said adjacent side and the said one closing flap, said cut having such a width that if, when releasing the grip tongue from the package side, its materials should be separated into layers, and one of said layers should follow the tearing up of the gripping tongue, this action will be terminated at the said cut.

8. An arrangement according to claim 1 in which the pour hole has such a form that it is wider close to the creasing line between the said one flap and the adjacent side of the package but ends in a point at its end remote from the said adjacent side of the package.

9. An arrangement according to claim 8, in which the said hole is drop-formed.

10. An arrangement according to claim 1, in which a pattern is formed on the two plastic layers where they are attached to each other at the hole.

11. An arrangement according to claim 1, in which the pour opening is located at an area of the package inside of which the liner is a single layer.