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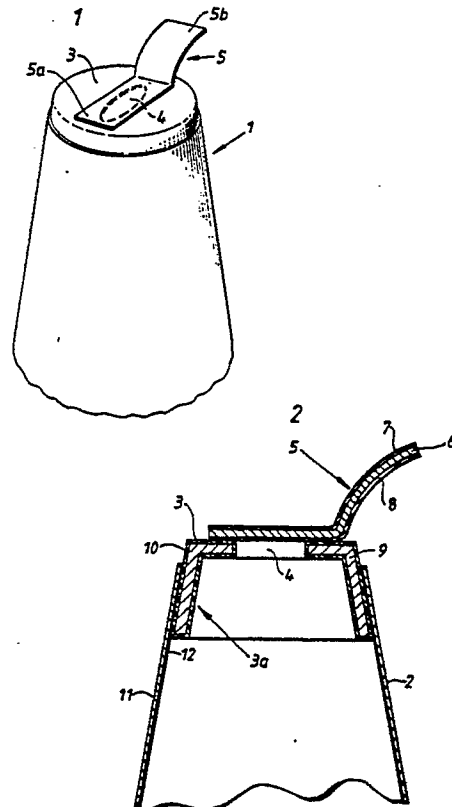
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A packing container for liquid, especially pressurized contents.

A packing container comprising an end wall (3) and an emptying opening (4) incorporated in the end wall which is covered by means of a cover strip (5) applied detachably to the outside of the end wall. The cover strip (5) as well as the end wall (3) consist of a plastic-coated metallic material and are attached to one another along a sealing joint formed by surface fusion around the whole emptying opening.



## A PACKING CONTAINER FOR LIQUID, ESPECIALLY PRESSURIZED CONTENTS

The present invention relates to a packing container of non-returnable character for liquid, especially pressurized, contents, which comprises at least one plane end wall, an emptying opening incorporated in the end wall and an outer cover strip which is applied over the emptying opening to the outside of the end wall.

In packing technology frequently non-returnable packages of a can character are used for the packaging of liquid, especially pressurized, contents such as beer, refreshing beverages and similar carbonated products. These known can packages generally consist of a cylindrical can body provided with a base, the upper end of the can body being closed with the help of a, substantially, plane end wall which is seamed onto the cylindrical can body. The cylindrical can body generally consists of plastic or metal, e.g. iron or aluminium, whereas the plane end wall as a rule always consists of sheet aluminium.

To make the package conveniently openable it is provided in most cases with some type of opening arrangement which on the one hand should make the package readily openable and on the other hand should allow a smooth emptying of the contents from the opened package.

A very usual opening arrangement on such known can packages has a weakened or openable part in the plane end wall which by means of a pull-ring fixed to the weakened or openable part is adapted so that it can be completely pulled off to expose an emptying opening through which the contents of the package can be made accessible. One problem, not infrequently encountered in this, intrinsically simple and in most cases well-functioning, opening arrangement is that the openable end wall has to be manufactured from a relatively soft material, preferably aluminium, which is both soft and easy to process, but which from a point of view of manufacture is a very energy-consuming and thus cost-demanding metal. For the sake of making the package more economical, therefore, it is necessary, among other things, to recover and reuse as much as possible of the aluminium content of the package used, which, however, is counteracted or seriously obstructed by the fact that the part of the end wall of the package pulled off on opening of the package, including the pull-ring, in most cases is thrown away and thus is completely lost after a single use. To the economic loss also comes that the wasted portion of the end wall represents a substantial environmental problem, since it can remain lying about in nature for a very long time before it breaks down through corrosion, and constitutes during this time, because of

its sharp edges, a hazard to humans and animals.

Another opening arrangement on known can packages of the type which has been described above consists of an emptying opening incorporated in the end wall of the drum which is covered by a cover strip or similar closure device glued detachably onto the outside of the end wall. This known opening arrangement too is relatively simple and easy to manufacture and as a rule functions well, but it has the disadvantage, among other things, especially in the case of can packages for pressurized contents, that it requires environmentally doubtful and expensive glue to provide the joint between cover strip and package end wall with the required tightness and durability.

The abovementioned inconveniences are avoided in accordance with the present invention in that a packing container of the type described in the introduction has been given the characteristic that the cover strip as well as the said end wall are made of a material comprising a layer of metal and at least one outer coating of weldable plastics and that the cover strip is connected to the end wall along a sealing joint around the whole emptying opening which is liquid-tight, but can be broken up, formed by surface fusion of plastic coatings facing one another on the cover strip and the end wall respectively.

In accordance with a particularly preferred embodiment of the invention the sealing joint between the cover strip and the end wall of the package is produced by inductive heating in a manner known in itself of the metal layers incorporated in the cover strip and the end wall respectively, which has been found to bring about that the package can be closed in a rapid and simple manner and that the actual closing process can be easily monitored both with regard to heating period and temperature and that the sealing joint will be tighter and more durable than, for example, in the case of glueing.

Further preferred embodiments and advantages of the invention have been given, moreover, the characteristics specified in the following subsidiary claims.

The invention will now be described in greater detail with special reference to the attached drawing, wherein

Figure 1 shows schematically the top part of a packing container provided with an opening arrangement in accordance with the invention, and

Figure 2 shows a central section of the container according to Figure 1.

Although the invention can be applied to all packages of a can character, it is assumed in the special embodiments referred to here that the

package, which has been given the general reference designation 1, is of the type which is shown in Figure 1 and which consists of an upwards tapered can body 2 provided with any kind of bottom closure and a substantially plane end wall 3 arranged at the upper open end of the can body. The end wall 3 has an emptying opening 4 incorporated beforehand which is covered on the top by means of an outer cover strip 5 applied to the outside of the end wall. The cover strip 5 comprises on the one hand a mounting part 5a, which is connected detachably to the end wall 3 over the emptying opening 4, and on the other hand a readily accessible gripping part 5b by means of which the cover strip 5 is adapted to be removed on opening of the package.

As is evident more clearly from Figure 2, the cover strip 5 is manufactured from a laminated material comprising a central layer of material strong in tension, e.g. iron, and outer coatings 7 and 8 of weldable plastic, e.g. polyester (preferably polyethylene terephthalate). Figure 2 further illustrates that the end wall 3 too is manufactured from a material comprising a central metallic layer 9 with an outer coating 10 of weldable plastics, e.g. polyester (preferably polyethylene terephthalate). The end wall 3 has a downwards directed edge portion 3a serving as a fastening means which extends unbroken around the whole periphery of the end wall and which, at least partially, is inserted in, and is fastened to, the inside of the can body 2 along a liquid-tight and mechanically durable sealing joint around the whole thus inserted part of the edge portion 10 of the end wall.

As pointed out earlier, it is important that the joint between the outer cover strip 5 and the end wall 3, on the one side, should be sufficiently strong to be able to withstand the internal pressure of the package, which in the case of contents such as beer, refreshing beverages and similar carbonated drinks may go up to approx. 7 bar, but that the joint, on the other side, should not be so strong that, on opening of the package, an intentional pulling off of the cover strip is made impossible or is made unnecessarily difficult. In accordance with the invention a desirable optimum joint is obtained in that the cover strip 5 and the end wall 3 are connected with one another along a sealing joint formed by surface fusion between the plastic coatings 8 and 10 respectively facing one another, and it has been found in particular that a sealing joint which functions well and is easily controllable can be obtained if the cover strip 5 and the end wall 3 are joined to one another by inductive heating of metal layers 6 and 9 incorporated in the cover strip 5 and the end wall 3 respectively. Such an inductive heat sealing is both rapid and simple and can be carried out with the help of existing conventional

equipment. The method, among other things, has the further advantage that it can be easily monitored both with regard to heating period and to temperature, so that a mechanically durable sealing joint which is liquid-tight but easily breakable is obtained around the whole emptying opening 4.

The can body 2, which preferably is of the conical shape indicated in Figures 1 and 2, is also manufactured appropriately from a material comprising a thin inner metal layer 11 and at least one outer coating 12 of weldable plastic, preferably polyethylene terephthalate, facing towards the inside of the package, as a result of which the joint between the inserted part of the edge portion 10 of the end wall 3 and the inner plastic coating 12 of the container body 2 can also be achieved by inductive heating in a manner known in itself.

The example of an embodiment of the invention described here is intended solely to illustrate a particularly suitable embodiment, and it is possible, of course, within the scope of the concept of the invention to realize a number of modifications, both with regard to the composition, and to the general design, of the packing container without departing, for this reason from the actual idea of the invention.

### Claims

1. A packing container comprising at least one end wall (3) and an emptying opening (4) incorporated in the said end wall and an outer cover strip (5) which is applied over the emptying opening to the outside of the end wall, **characterized in** that the cover strip (5) as well as the said end wall (3) consist of a material comprising a layer of metal and at least one outer coating of weldable plastic and that the cover strip is connected with the end wall along a sealing joint around the whole emptying opening which is liquid-tight but can be broken up, formed by surface fusion of plastic coatings (8 and 10) facing one another on the cover strip (5) and on the end wall (3) respectively.

2. A packing container in accordance with claim 1, **characterized in** that the sealing joint is achieved by means of inductive heating of metal layers (6 and 9) incorporated in the cover strip and in the end wall respectively.

3. A packing container in accordance with claim 1 or 2, **characterized in** that the metal layer (9) of the end wall consists of iron.

4. A packing container in accordance with any one of the preceding claims, **characterized in** that the metal layer (6) of the cover strip consists of iron.

5. A packing container in accordance with any-

one of the preceding claims,  
**characterized in** that the said plastic coatings are constituted of a polyester, preferably polyethylene terephthalate.

6. A packing container in accordance with any- 5  
one of the preceding claims,  
**characterized in** that the said end wall has a downwards directed edge portion (10) serving as a fastening means.

7. A packing container in accordance with 10  
claim 6,  
**characterized in** that the edge portion (10) of the end wall is taken up at least partly in, and is sealed to, the inside of the upper open end of an upwardly tapering container body (2) provided with a base. 15

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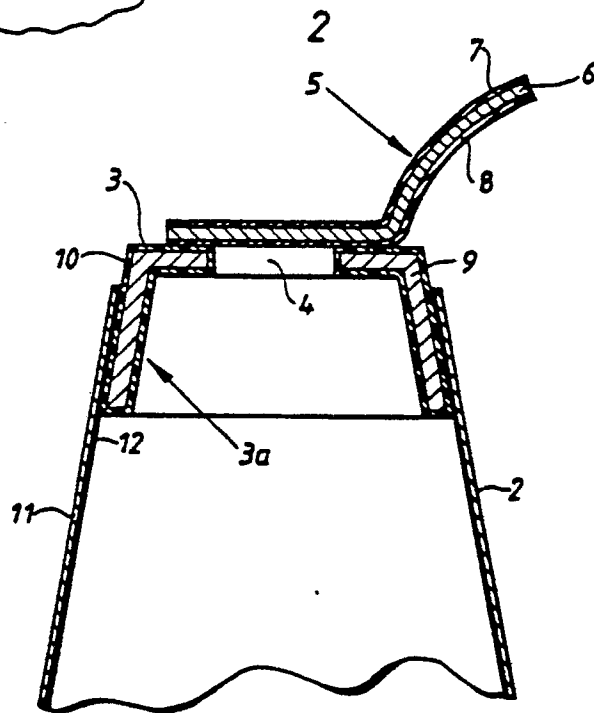
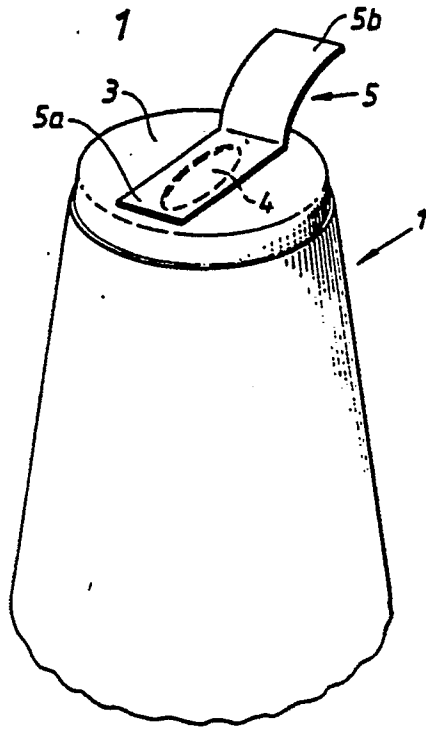
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US,A, 4 397 401 (HIROSHI UENO ET AL) 9 August 1983 *See the whole document* - - -	1-5	B 65 D 3/26 B 65 D 5/70 B 65 D 17/50
X	US,A, 4 526 287 (YASUNORI MIYAMATSU ET AL) 2 July 1985 *See the whole document* - - -	1-5	
X	US,A, 4 650 088 (KAZUMI HIROTA ET AL) 17 March 1987 *See the whole document* - - -	1,3,5	
X	CH,A5 650 210 (ALUMINIUMWERKE AG RORSCHACH) 15 July 1985 *See the whole document* - - -	1,35	
X	GB,A, 2 157 644 (WEIDENHAMMER PACKUNGEN KG GMBH & CO) 30 October 1985 *See page 1, line 59 - page 3 line 32, figure 1* - - -	1	
X	CH,A5,563 284 (FR HESSER MASCHINENFABRIK AG) 30 June 1975 *See the whole document* - - -	1	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)  B 65 D
Y	- - -	6	
Y	CH,A5, 643 790 (VEREIGNIGTE METALLWERKE RANSHOFEN-BERNDORF AG) 29 June 1984 *See the whole document* - - -	6	
A	US,A, 898 293 (CHARLES WESLEY WARREN) 8 September 1908 *See page 1, lines 100-107, figures 1,2* - - -	7	
The present search report has been drawn up for all claims			
Place of search STOCKHOLM		Date of completion of the search 18-06-1990	Examiner Åkerlund H.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			