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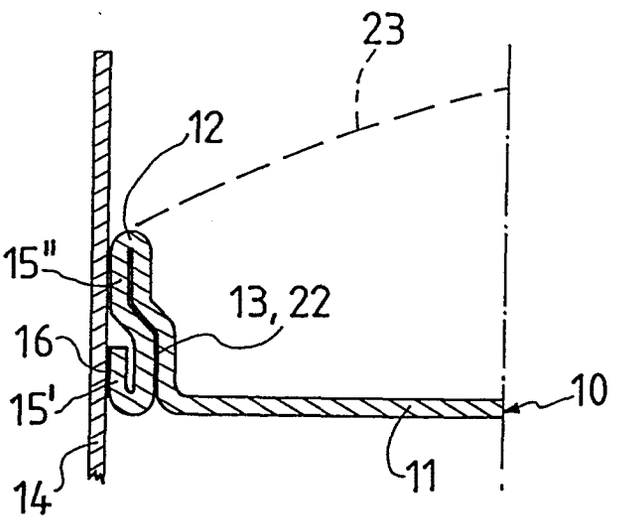
(54) A closure.

(57) A closure for a packaging container (14), comprising a cover panel of a flexible material and a marginal part (12) attachable to the edge of an opening of the container.

The marginal part comprises a sealing area (22) exposed to the internal region of the package and at least partially comprising a flexible material having a lower sealing strength than the sealing strength of the marginal part against the edge of the container.



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TITLE OF THE INVENTION

A CLOSURE.

FIELD OF THE INVENTION

The present invention relates to a closure for a packaging container, primarily for pressure creating or pressurized filling goods, for instance carbonated drinks. With advantage the closure is useful also in general for containers having relatively thin walls. Additionally, the closure is of a heat sealable type providing an adequate sealing pressure in the sealing area.

BACKGROUND OF THE INVENTION

The problem behind the invention is to provide a closure having strain resisting sealing characteristics and an inherent controllable deformation resistance against internal pressure as well as handling.

The problem is also to provide means allowing expansion, created by pressure, of the volume of the package such that a volume in excess to the nominal filling volume may be assumed.

A most important sub-problem is to provide a closure allowing sealing with an acceptable counter-pressure, meaning the provision of a sufficient sealing pressure in the sealing area.

In for instance the European patent specification No. 0029039 there is described an end closure for a sleeve shaped packaging container manufactured from a relatively thin material. As such, the end closure reinforces the packaging construction, but for the rest there is no solution to the main problem or the sub-problems of the present invention.

SUMMARY OF THE INVENTION

In order to eliminate such lack the invention in general provides a closure for a packaging container comprising at least one panel of a relatively thin and

flexible material for substantially covering an opening in the packaging container, and a marginal part surrounding the panel and attachable to the edge of the opening. The closure is characterized in that the marginal part comprises a sealing area having a fold formed in the panel and exposed to the internal region of the package, said sealing area at least partially consisting of the said flexible material and having a sealing strength in the interval zero to less than the sealing strength of the marginal part against the edge.

In one embodiment the closure forms the end piece of a sleeve shaped container casing, and the sealing area comprises a fold having radially inner and outer rims and extending circumferentially around the panel. The radially outer rim of the fold is integral with a lip of the marginal part that is attachable to the casing.

In said embodiment preferably the radially outer rim forms said lip.

In another embodiment the lip comprises a double layer of the flexible material.

In a manner known per se, in order to increase the deformation resistance, the layers of the lip preferably are sealed against each other.

In the actual embodiment the sealing strength between the layers of the lip is higher than the sealing strength of the fold.

In order to "hide" the "cut edge" of the double layer, this layer preferably comprises at least the lower portion of the rim and a skirt folded around the rim.

The extension of the skirt preferably is such that at least one edge is hidden behind the rim and/or in the wall of the packaging container.

In either one of said embodiments the marginal part with advantage comprises a conical region acting as an entering part.

The marginal part and/or the panel preferably also

comprises a material suitable for induction sealing or high frequency welding or a combination thereof, at least in the sealing area.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 in a partial section view shows a first embodiment of an end closure of a container together with a portion of a container wall,

Figure 2 in a partial section view shows another embodiment of an end closure of a container together with a portion of a container wall,

Figure 3 in a partial section shows a third embodiment of an end closure of a container together with a portion of the wall of the container,

Figure 4 in a partial section view shows a fourth embodiment of an end closure of a container together with a portion of a container wall,

Figure 5 in a partial section view shows a container closure according to the principles of the invention provided with a conical entering portion,

Figure 6 shows a trapezoid strip which is to be formed into a truncated conical funnel for forming an essentially smooth abutment surface against the inside of the packaging container,

Figure 7 shows an injection moulded closure having a foil laminated thereto,

Figure 8 shows a closure having a conical double rim,

Figure 9 shows the closure in a sealed state,

Figure 10 shows an injection moulded closure having an overdimensioned sealing label, and

Figure 11 shows an injection moulded closure consisting of two parts, also having an overdimensioned sealing label.

DESCRIPTION OF PREFERRED EMBODIMENTS

In Figure 1 the reference numeral 10 generally relates to a container closure shown in a partial section view and comprising a lid panel 11 and a marginal part 12. In the

embodiment that has been shown the closure 10 is manufactured from a relative thin flexible material, for instance a laminate comprising an aluminium foil having a thickness in the interval 10 to 200 µm and having a coating of a thermoplastic material, preferably a polyolefine, on one or both sides thereof. Other type of material/material combinations are of course possible, for instance plastic laminates/plastic film having a suitable additive for giving the required tightness degree and/or for allowing a specific sealing method.

A sealing area comprising a fold 13 extending around the panel 11 is formed in the end closure and exposed to the internal region of the package, which here merely has been shown as a portion of a sleeve wall 14. In this case the fold is formed by folding the margin of the blank forming the closure 10. The fold has an outer rim 15, which is this case alone forms a lip for sealing against the sleeve wall. The seal 16 between the rim and the sleeve is formed with a sufficient sealing pressure for obtaining an acceptable sealing. This pressure is obtained in that a counter-pressure is created by means of a support 17 which is displaceable in the directions of the double arrow 18 and for instance expandable in the directions of the double arrow 18' and which co-operates with a stationary support 19. The sealing technique used may for instance comprise induction welding or high frequency welding, and in this case the material of the end closure 10, at least in the welding area comprises an additive well suited for the actual welding technique. For rational reasons the end closure generally is laminated with a metal foil (not explicitely shown in Figures 1 to 5) along the entire surface thereof. In the embodiment according to Figure 1 the seal 16 preferably extends along the entire height of the rim 15 and continously around the sleeve 14.

In order to protect the free edge of the rim, the cut edge, a lacquer layer 20, alternatively a tape or other

protective means is arranged along the edge facing the internal region of the package.

Alternatively, it is possible to press the edge into the material of the casing 14, as shown by the reference numeral 21 in Figure 1.

The fold 13, which is exposed to the internal region of the package, has a seal 22 of so called peelable type. The seal 22 is thus weaker than the seal 16.

If for some reason, for instance due to a pressure increase originating from the filling goods, the internal pressure increases within the container, the seal 22 will break (if such a seal exists, i.e. a seal having a strength higher than zero). The flexible end closure 10 (cover panel 11) then assumes its natural shape according to the broken lines 23 in Figure 1. Due to the increase of volume the pressure decreases inside the container. The seal is protected by this construction, meaning that the risk for leakage and destruction of the contents of the package is reduced at the same time as the fold construction, in the manner mentioned, allows the creation of an acceptable sealing pressure.

In Figure 2 there is shown a lip 15 comprising double material layers 15' and 15". The layer 15' forms a skirt which is folded and sealed against the rim 15" in order to reinforce the end closure. The seal 15"' preferably is of the same strength as the seal 16 and has an extension in the height direction for instance equal to the height of the rim 15". The seal may also be accomplished dot-wise, alternatively along a certain part of the height of the rim. In the same manner as previously, the fold 13 has a peelable seal 22, which at a strain exceeding the maximum load allows resetting of lid panel 11 to the natural position 23 thereof.

The free edge of the skirt 15' is turned away from the internal region of the container and in Figure 1 the skirt is located at the same level as the upper edge of the

sleeve 14 and the uppermost portion of the lip 12.

An extension of the skirt 15' according to the broken line 24 is also possible.

I Figure 3 the edge part 12 is placed in a position below the top edge of the sleeve 14. Such placement implies that the lid panel 11, in the natural position 23 thereof, is protected by the sleeve 14 and/or the skirt 15'.

In Figure 4 there is shown a version of an end closure where the skirt 15' is shortened and the upper portion of the rim 15" of the marginal part 12 is sealed against the sleeve 14. This seal together with the seal 16 forms the actual sealing of the end closure 10. In the same manner as previously there is a peelable seal 22 in the fold 13 exposed to the internal region of the package.

In Figure 5 there is shown a conical marginal part 12 for facilitating the entering operation. The rim 15 of the marginal part may be formed from or covered by a banderol 25 according to Figure 6. Such a banderol, punched out to a trapezoid shape, almost provides an essentially smooth sealing area.

Although the end closures in the embodiments shown have been manufactured from a flexible, foldable material it is realized that other processing techniques, for instance injection moulding, may be used as an alternative for manufacturing of certain parts, for instance the marginal part, of the end closure.

In Figure 7 there is shown a version where the lid panel 11 comprises a relatively thick material and for instance is injection moulded and thereafter laminated by an aluminium foil 11' or corresponding. The idea is to provide a double layer 12 which may be pressed together and pressed against the walls of the sleeve or the opening edge against which the closure should be placed. The pressing together may for instance be accomplished by pressing the panel 11 axially inwards the container at the same time as the rim 15 is prevented from moving into the sleeve.

Such a controlled pressing operation may be obtained by overdimensioning the double layer relative the opening, at least in certain areas of the double layer, for instance by forming said layer with a truncated conical shape as in Figure 8.

Figure 9 shows the effect of the pressing together pressure - between the layers and against the sleeve - after folding. Frequently, the "void space" will not occur, but in Figure 9 it has been indicated for illustration purposes as a result obtainable by a controlled application of pressure in the welding area.

In Figure 10 there is shown a pressure resistant closure obtained by over-dimensioning the foil/sealing label 11' relative the opening in the sleeve 14. When pressure occurs or strain occurs in the weld 16, the strain is transferred by the relatively stiff rim 15, meaning an advantageous "line load" (along a line in the height direction) in the welding area (contrary to a strain along a peripheral line).

Still increased strain resistance is possible by the two-part closure in Figure 11 comprising a separate panel 11 and a separate marginal part 12.

CLAIMS

1. A closure for a packaging container (14), comprising at least one panel (11) of a relatively thin and flexible material for substantially covering an opening in the packaging container and a marginal part (12, 15) surrounding the panel and attachable to the edge of the opening, c h a r a c t e r i z e d in that the marginal part comprises a sealing area (22) having a fold formed therein and exposed to the internal region of the package, said sealing area at least partially consisting of the flexible material and having a sealing strength in the interval from zero to a strength lower than the sealing strength of the marginal part to be attached against said edge of the opening.

2. A closure according to claim 2, where the closure consists of an end piece (10) for a sleeve shaped container casing (14), c h a r a c t e r i z e d in that the sealing area comprises a fold (13) having radially inner and outer rims and extending around the panel, said radially outer rim (15, 15") of the fold being integral with a lip (15) of the marginal part of the closure attachable to the casing.

3. A closure according to claim 2, c h a r a c t e r i z e d in that the radially outer rim (15) forms said lip (Figure 1).

4. A closure according to claim 2, c h a r a c t e r i z e d in that the lip comprises a double layer (15', 15") of the flexible material.

5. A closure according to claim 4, c h a r a c t e r i z e d in that the layers of the lip are sealed (Figure 2) against each other.

6. A closure according to claim 5, c h a r a c t e r i z e d in that the sealing strength between the layers of the lip is higher than the sealing strength of the fold (12).

7. A closure according to anyone or any of the preceding claims 4 to 6, c h a r a c t e r i z e d in that the double layer (15, 15") comprises at least the lower portion of the rim and a skirt (Figure 4) folded around said rim.

8. A closure according to claim 7, c h a r a c t e r i z e d in that the extension of the skirt (15') is such that at least the edge thereof is hidden behind the rim (15") and/or in the wall (at 21) of the packaging container.

9. A closure according to anyone or any of the preceding claims, c h a r a c t e r i z e d in that the marginal part (12) comprises a conical portion (Figure 5) formed as an entering part.

10. A closure according to anyone or any of the preceding claims, c h a r a c t e r i z e d in that the marginal part and/or the panel comprises a material suited for induction welding/high frequence welding, at least in the sealing areas.

11. A closure for a packaging container (14), comprising at least one element (11, 11') substantially covering an opening in the packaging container and a marginal part surrounding said element and attachable to the edge of the opening, c h a r a c t e r i z e d in that the marginal part is formed as a double layer (12, 15) arranged for being pressed together and pressed against said edge by the edge of the opening.

12. A closure according to claim 11, c h a r a c t e r i z e d in that said double layer comprises a substantially truncated conical envelope surface.

13. A closure according to claim 12, c h a r a c t e r i z e d in that said marginal part, at least in the sealing areas thereof is laminated with a metal foil or corresponding arranged for induction welding and/or high frequency welding.

14. A closure for a packaging container (14), comprising at least one element (11; 11, 11") substantially covering an opening in the packaging container and a marginal part surrounding said element and attachable to the edge of the opening, c h a r a c t e r i z e d in that said element comprises a flexible material which is over-dimensioned relative said opening and with at least a portion thereof arranged for abutment against the marginal part (12, 15) and/or the element (11).

15. A closure according to claim 14, c h a r a c t e r i z e d in that the element covering said opening is placeable by snap action into the marginal part.

16. A closure according to claim 14, c h a r a c t e r i z e d in that the panel is positioned such that it receives the flexible material without streching.

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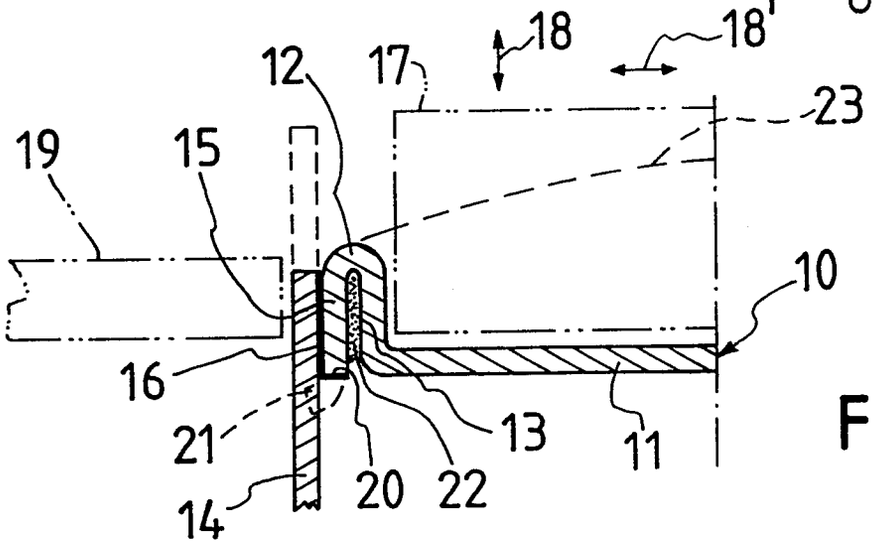

FIG. 1

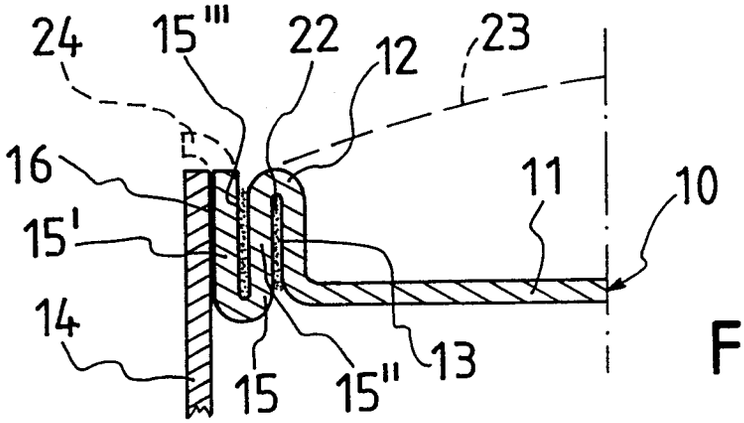

FIG. 2

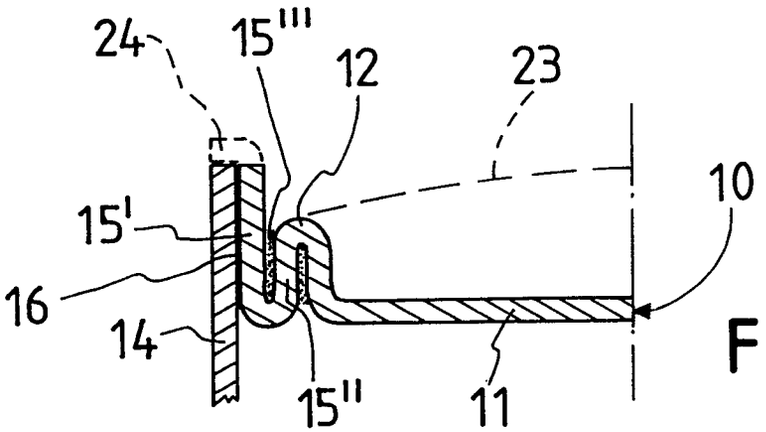

FIG. 3

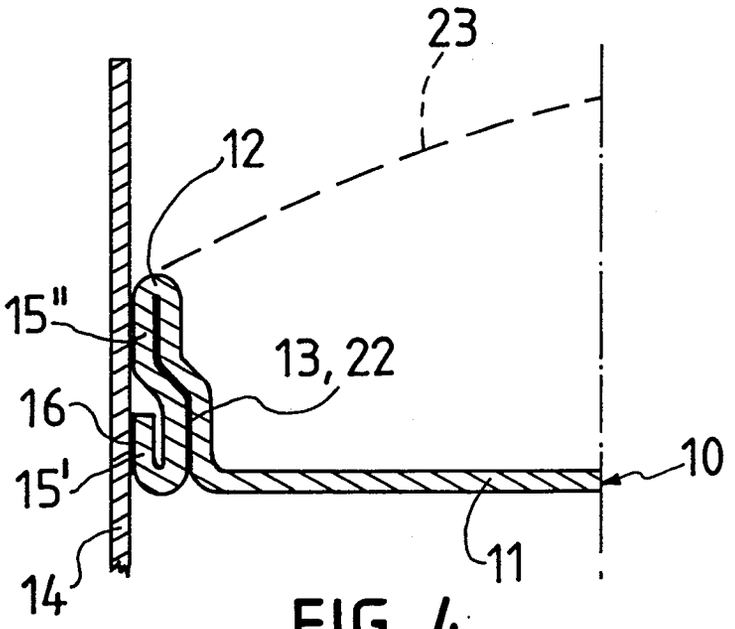

FIG. 4

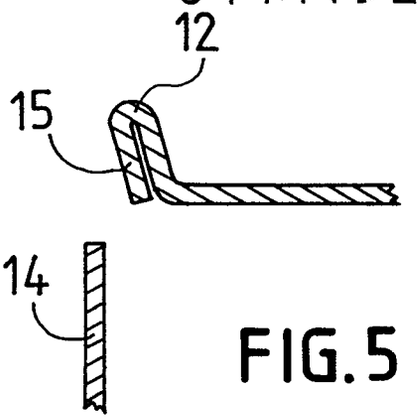

FIG. 5

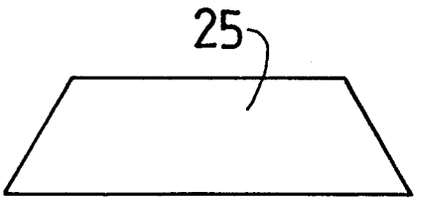

FIG. 6

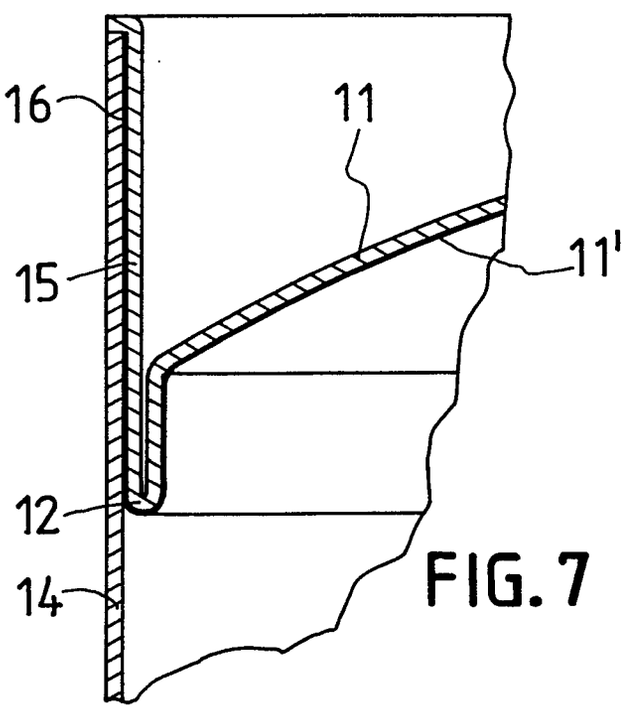

FIG. 7

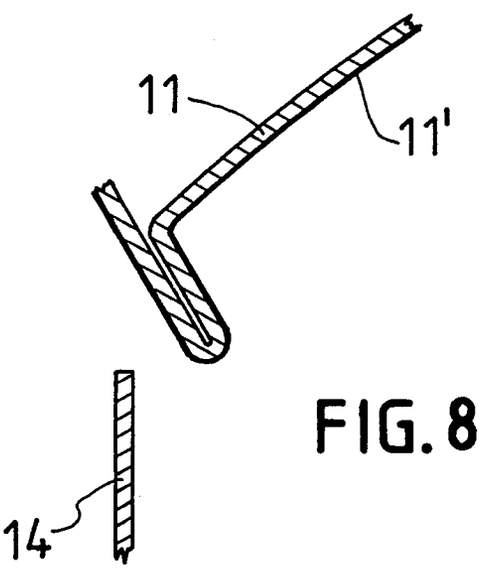

FIG. 8

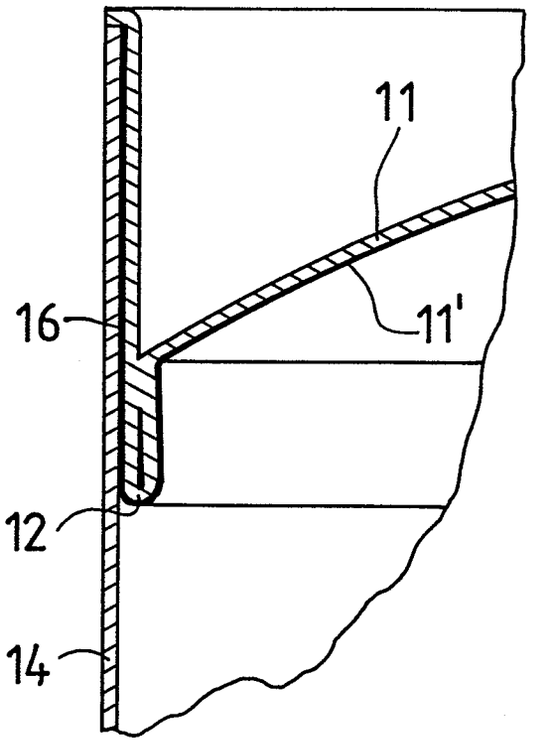

FIG. 9

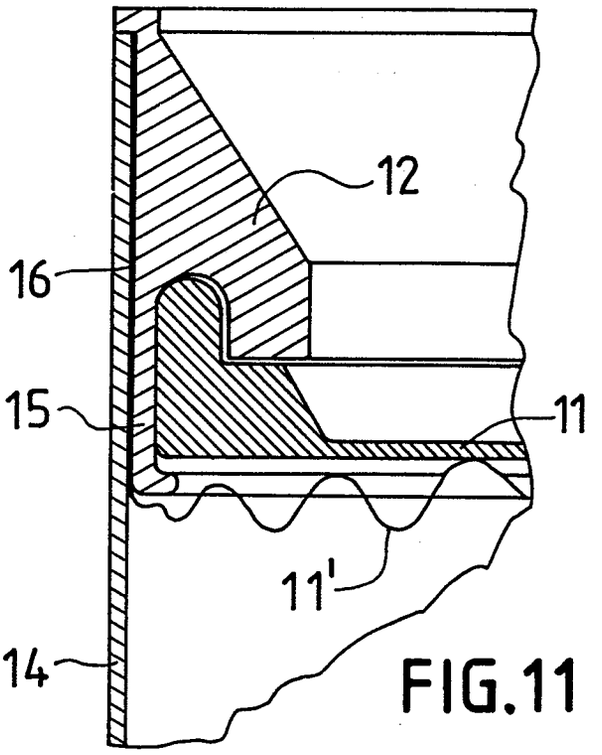

FIG. 11

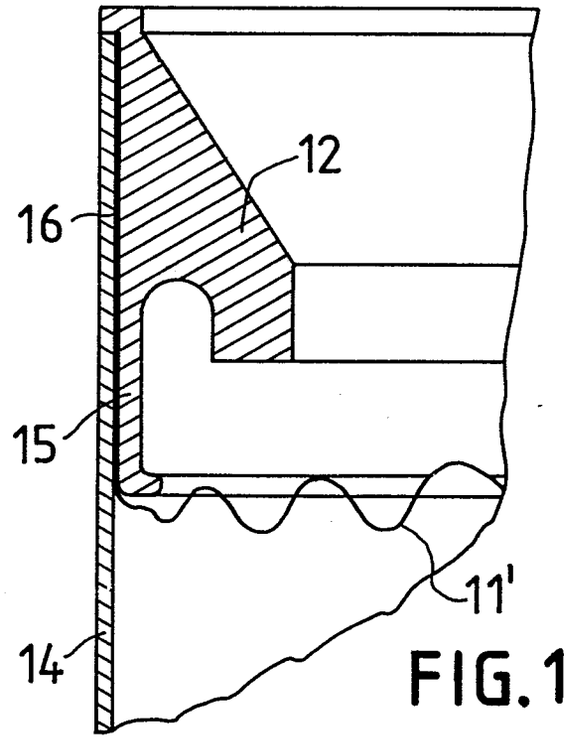

FIG. 10