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(54) Can with lid and closing ring.

(57) The invention relates to a can (1) with a lid (9). The can comprises a base (3), a standing wall (2) joined thereto along the periphery and a ring (5) which is connected to the upper edge of the standing wall and which defines an opening (8) for receiving therein the lid, wherein the ring is releasably connected to the wall. The upper edge of the wall can have an outward facing beaded edge (4) and the ring can have a flange resting on the beaded edge, wherein clamping means are present for clamping the flange on the beaded edge. The invention further relates to a tool for releasing the ring from a can.

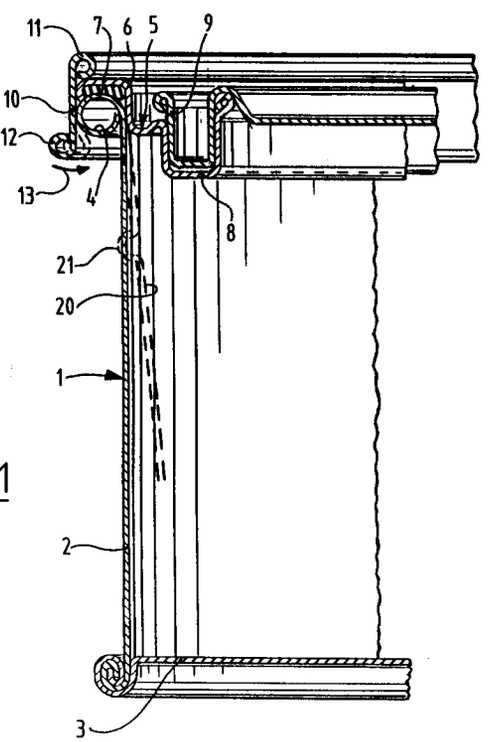


FIG.1

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The present invention relates to a can with lid, such as for instance a paint can.

Two types of such cans can generally be distinguished. In the first type a ring is seam-folded into the top, into which ring a lid can be clamped. The second type does not have such a ring and the lid herein fits directly against the inside of the side wall of the can.

The first type has the advantage that the lid can be easily removed and rearranged, so that the content can be used up in phases. The ring herein forms a good mounting means for attachments. This finds application for instance in paint mixing machines, with which a desired colour of paint can be made up from a number of basic colours. These basic colours are supplied in cans of the present type and are placed in the machine with, on the opening, a lid forming part of the machine, on which lid is mounted a stirring means and a suction conduit.

The drawback to this first type of can is that it cannot be nested and it is awkward to empty the can completely. A small remnant of the content remains held behind the ring when the can is poured out. This is disadvantageous since the content of such a can, when for instance it is a paint can, can have an environmental impact and any remnant not removed from the can may end up as waste in the environment.

The second type can in contrast be entirely emptied without any remnant being left behind therein. The drawback to this can is that an attachment as referred to above cannot be arranged without problem on these cans.

The invention now has for its object to provide a can in which the advantages of both types are combined.

In the can according to the invention this is achieved in that the can contains a releasable ring in which a separate clamping lid can be received.

Before the can is filled the basic part thereof can be nested if the wall of the can is conical. After filling, the ring with the lid already received therein is placed on the can in order to close the can.

When the content is required, the clamping lid can simply be opened in the usual manner and closed again afterward.

An attachment of for instance a paint mixing machine can be placed without problem on the can and clamped on the ring.

When the can is practically empty and the final remnant of the contents must be removed therefrom, the releasable ring is taken off the can and the can may be completely emptied and cleaned.

The can may optionally be reused. Because the rim of the can is protected by the ring during use it remains intact and suitable for re-use. It is possible to clean the can very well, which is a condition of re-use.

A good embodiment, wherein the ring is connected to the can in reliably sealed manner, is characterized in claim 2.

Particularly suitable herein is the step of claim 3.

A suitable embodiment of the clamping means is characterized in claim 4. Closing strips are per se known for firm connection to the can of the lid of a can of the second type as stated in the preamble for transport purposes. In order to open the can the closing strip is then removed. In the can according to the invention the closing strip is only removed when the can must for instance be cleaned and the releasable ring must be taken off the can.

According to further suitable embodiment the closing strip can be of the type with a lever closure. The clamping strip can then itself be re-used.

Another suitable embodiment of the can according to the invention is characterized in claim 7. The ring herein snaps into the hollow or bulge of the can wall. The assembly operations are limited in favourable manner and subsequent release of the ring can also take place in simple manner.

A suitable embodiment of the can according to the invention for use in a paint mixing machine is characterized in claim 8. The ring of this embodiment is suitable for re-use many times and ensures in each case a good sealing in the can and a good engagement of the attachment of the paint mixing machine.

A further development of the can according to the invention is characterized in claim 9. When the ring is mounted the lips are bent round the beaded edge, whereby the ring is clamped to the can. In order to release the ring only the lips have to be bent outward.

In order to enable a good engagement on the lips from the outside the step of claim 10 is preferably applied.

By applying the step of claim 11 the lips can take a shorter form, whereby a material saving is achieved.

Removal of the ring can, as noted, take place by bending the lips outward. In those cases where the ring has to be removed from large numbers of cans a tool is preferably used as characterized in claim 12. By depressing the ring the lips bend open and the ring can be removed easily.

The step of claim 13 is preferably applied herein. The gripper holds the ring fast after the lips thereof are bent outward through the action of the pressing member. The ring is subsequently removed with the gripper.

The invention will be further elucidated in the following description with reference to the annexed figures.

Fig. 1 shows a partial section of a can according to a first embodiment of the invention.

Fig. 2 shows the corresponding part of a tool with which the can of figure 1 can be closed.

Fig. 3 shows on larger scale a slightly modified embodiment of the can of figure 1.

Figs. 4 and 5 show two other embodiments of the invention.

Figs. 6 and 7 show yet other embodiments in combination with an attachment.

Fig. 8 shows a partly perspective view of a can according to a further development of the invention.

Figure 9 shows a section on larger scale according to IX-IX in figure 8.

Figs. 10-12 show views corresponding with figure 9 of other embodiments.

Fig. 13 shows schematically the operation of a tool for removing a ring in the case of a can as according to any of the figures 8-12.

The can 1 as shown in figure 1 comprises a cylindrical wall 2 into which a bottom 3 is seam-folded. A beaded edge 4 is formed on the top side of the wall 2.

Placed on the beaded edge 4 is a ring 5 in which a channel section 8 is arranged and in which a lid 9 can be received in usual manner.

On the outer edge the ring 5 is provided with a reverse channel section in which a sealing mass 7 is arranged which forms the seal between ring 5 and beaded edge 4. In order to fix the ring 5 on the can wall 2 a closing strip 10 is provided which has an upper inward oriented beaded edge 11 with which the closing strip 10 lies on the ring 5, and a lower outward oriented beaded edge 12 which is deformed in the direction of arrow 13 using the tool 15 shown in figure 2 so that it is pressed closingly under the beaded edge 4.

The tool 15 comprises a pressing member 16 which, due to a suitable profiling, first slightly deforms the beaded edge 11 and then presses the ring 5 together with beaded edge 11 onto the can wall 2, whereby a good contact results between the sealing mass 7 and the beaded edge 4.

The tool 15 further comprises a deforming member 17 which is moved downward over the pressed-on assembly, wherein a rounded edge 18 comes into contact with the lower beaded edge 12 of closing strip 10. When the deforming member 17 is moved further downward the beaded edge 12 is pressed in the stated manner in the direction of arrow 13 under beaded edge 4, whereby the ring 5 is fixed sealingly and with bias on the beaded edge 4.

During use the can 1 can be repeatedly opened and closed again by means of the lid 9. After the content has been used up the closing strip 10 is broken loose and the ring 5 can be removed from the can 1 so that the can may be easily cleaned.

Can 1 is shown with a cylindrical wall. It is of course also possible to embody this with a conical wall 20 as indicated with dashed lines so that it is nestable in the as yet unfilled situation before the ring 5 is arranged. Formed for this purpose in the conical wall 20 is a protruding edge 21 with which each can on top supports on the beaded edge 4 of the underlying can in the nested situation.

The can 25 of figure 3 has a slightly different form of the ring 26. The channel 27 into which the lid 28 engages connects directly against the wall of can 25.

In figure 3 the closing strip 29 is shown in the deformed situation. The bead 32 is, as shown, slightly flattened and the bead 33 is pressed under the beaded edge of the can.

In the inner wall of the can a hollow 30 is arranged extending all the way round just below the beaded edge. The ring 26 is provided with a corresponding bulging edge 31. When the ring 26 is arranged in its position the bulge 31 falls into the hollow 30 so that an accurate positioning of the ring is obtained relative to the can.

Figures 4 and 5 show another releasable mounting of the ring in the can. The can 40 is here also provided with a beaded edge 41 on its upper rim. On the inside of the can just below beaded edge 41 a bulge 43 is formed and a corresponding hollow 44 is formed in the ring 42. Bulge 43 and hollow 44 are dimensioned such that, when the ring 42 is pressed onto the can 40, the ring is held fast in certain manner on can 40. The thus formed snap-action coupling 45 can subsequently be released in simple manner by inserting a tool, for instance a screwdriver, between the upper edge of ring 42 and beaded edge 41 and flipping the ring 42 upward.

The bulge 43 and hollow 44 can be separate impressions but may also form an edge running all the way round.

Figure 5 shows an alternative embodiment wherein the snap-action coupling 46 is formed by a hollow 47 of the inner wall of the can and a bulge 48 of the ring.

The can 51 of figure 6 comprises a ring 52 consisting of a casting of aluminium alloy. Received into a peripheral groove hereof is a seal 53 which lies against the inside of the wall of can 51.

The ring 52 is fixed to the can 51 by means of clamping strip 54. This clamping strip can suitably be of a type with a lever closure so that it is easily releasable without the clamping strip or other parts of the can being damaged.

Shown in figure 6 is an attachment 55 of a stirring system of a paint mixing machine arranged on the ring 52. The attachment 55 has an edge 56 which fits into a recess of ring 52.

The attachment 55 is provided with a number of locks 57 which are arranged under the attachment 55 for rotation from above by means of a lever 58. The attachment 55 is locked onto the can 51 by rotating the lock 57 under the ring using the lever 58.

After the content of can 51 is used up, the attachment 55 is removed by releasing the lock 57. Thereafter the ring 52 can be removed from can 51 by releasing the clamping strip 54 and the respective components can be properly cleaned for reuse.

Figure 7 shows a can 60 with a slightly differently formed ring 61 which, however, can also co-act with a protruding edge 63 and a lock 62 of a closing piece of a stirring system.

In the can 65 according to the invention shown in figure 8 the ring 67 is clamped onto the wall 66 by means of lips 69 formed round the beaded edge 72 on the upper edge of wall 66. A lid 68 is clamped in the ring 67.

As shown in figures 8 and 9, the lips 69 are provided with a beaded edge 70. In the non-bent situation 71 of the lips 69 shown with dashed lines the ring can be laid onto the beaded edge 72 of the can. The lips 69 can be bent round the beaded edge 72 with a tool in a manner analogous to that shown in figure 2. Sealing material 73 which is accommodated in the flange of ring 67 is herein compressed slightly so that a good sealing results.

In order to remove the contents from the can in portions the lid 68 can be opened and rearranged. After emptying of the can the ring 67 can be removed by bending lips 69 outward. This can take place for instance with a pair of pliers which engages on the beaded edge 70. After the beaded edge has been bent back again into the position designated in figure 9 with dashed lines the ring 67 can be removed from the can.

Shown in figure 10 is a can according to the invention wherein an impression 76 is arranged in the beaded edge 75 in the bottom part thereof. When the lip 77 is deformed it falls into this impression 76. The lip 77 can, as can be readily appreciated from a comparison with figure 9, take a shorter form, so that a material saving can be achieved.

Figure 11 shows a can 80 according to the invention wherein the wall 81 is slightly expanded under the upper portion 82 supporting the beaded edge 83. The can 80 hereby has a larger capacity than the comparable can of figure 9 without additional material being required for this purpose. A material saving can of course also be achieved when a can is made with the same capacity as that of figure 9.

In the embodiment of figure 12 the lip 85 is not provided with a beaded edge. From the non-bent situation 86 indicated with dashed lines the lip 85 is bent beneath the beaded edge 87, for instance with a rolling treatment by means of a laterally engaging roller. In this operation the ring 91 is pressed onto the beaded edge 87 of the can, whereby the packing material is slightly compressed and a good sealing is obtained.

The ring 91 of a can with the embodiment of figure 12 can of course also be removed by bending the lips 86 outward with pliers. It is however more awkward to obtain a grip on the lips than when these are provided with a beaded edge as in the foregoing figures.

In conditions where many cans according to the invention are used and the ring thereof must be removed in each case, a tool can favorably be employed as shown schematically in figure 13. This tool comprises a pressing member 88 with an active diameter smaller than the diameter of the wall 92 of the can. The pressing member 88 engages on the ring 91 just to the inside of the flange 93. By now exerting a downward force with the pressing member 88 the flange 93 rotates inward round the beaded edge 87, wherein lip 85 moves upward along the outside of the beaded edge. The lip 85 is hereby released from under the beaded edge 87 and ring 91 can be taken off the can.

This preferably takes place using a gripper 89 which grips under a beaded edge 90 of ring 91 at a number of positions distributed along the periphery. As soon as the lips 85 are bent sufficiently outward the ring 91 can be lifted from the can with the gripper 89.

Claims

1. Can with lid whereof the can comprises a base, a standing wall joined thereto along the periphery and a ring which is connected to the upper edge of the standing wall and which defines an opening for receiving therein the lid, wherein the ring is releasably connected to the wall.

2. Can as claimed in claim 1, wherein the upper edge of the wall has an outward facing beaded edge and the ring has a flange resting on the beaded edge and wherein clamping means are present for clamping the flange on the beaded

edge.

3. Can as claimed in claim 2, wherein the flange has a shallow reverse U-shaped section in which a sealing material is arranged.

4. Can as claimed in claim 2 or 3, wherein the clamping means are formed by a closing strip which encompasses the beaded edge and the flange.

5. Can as claimed in claim 4, wherein the closing strip is of the type with a lever closure.

6. Can with lid as claimed in any of the claims 1-3, wherein the ring clamps into the opening formed by the upper edge of the wall.

7. Can as claimed in claim 6, wherein the clamping means are formed by a hollow or bulge extending all the way round and arranged at a distance from the upper edge and parallel thereto and, engaging respectively therein or thereon, a corresponding bulge or hollow of the ring.

8. Can as claimed in any of the foregoing claims, wherein the ring is a casting of an aluminium alloy, in a peripheral groove of which a seal is received lying sealingly against the inside of the wall of the can.

9. Can as claimed in claim 2 or 3, wherein the clamping means are formed by a number of lips on the flange which are bent round the beaded edge.

10. Can as claimed in claim 9, wherein the lips are provided on their outer edge with a beaded edge.

11. Can as claimed in claim 9 or 10, wherein the beaded edge is provided on its periphery and below the middle with an impression.

12. Tool for releasing the ring from a can as claimed in any of the claims 9-11, comprising a pressing member which has an active diameter smaller than the diameter of the wall and which can exert a force parallel to the wall on the ring on a part of the ring lying inside the periphery of the wall.

13. Tool as claimed in claim 12, comprising a gripper engaging on the ring.

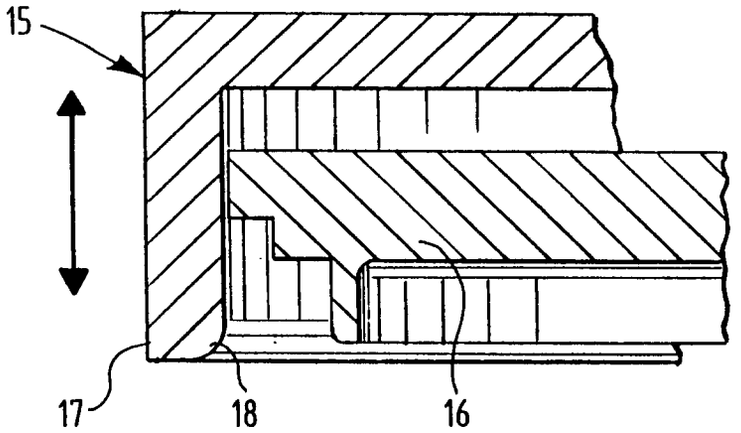


FIG. 2

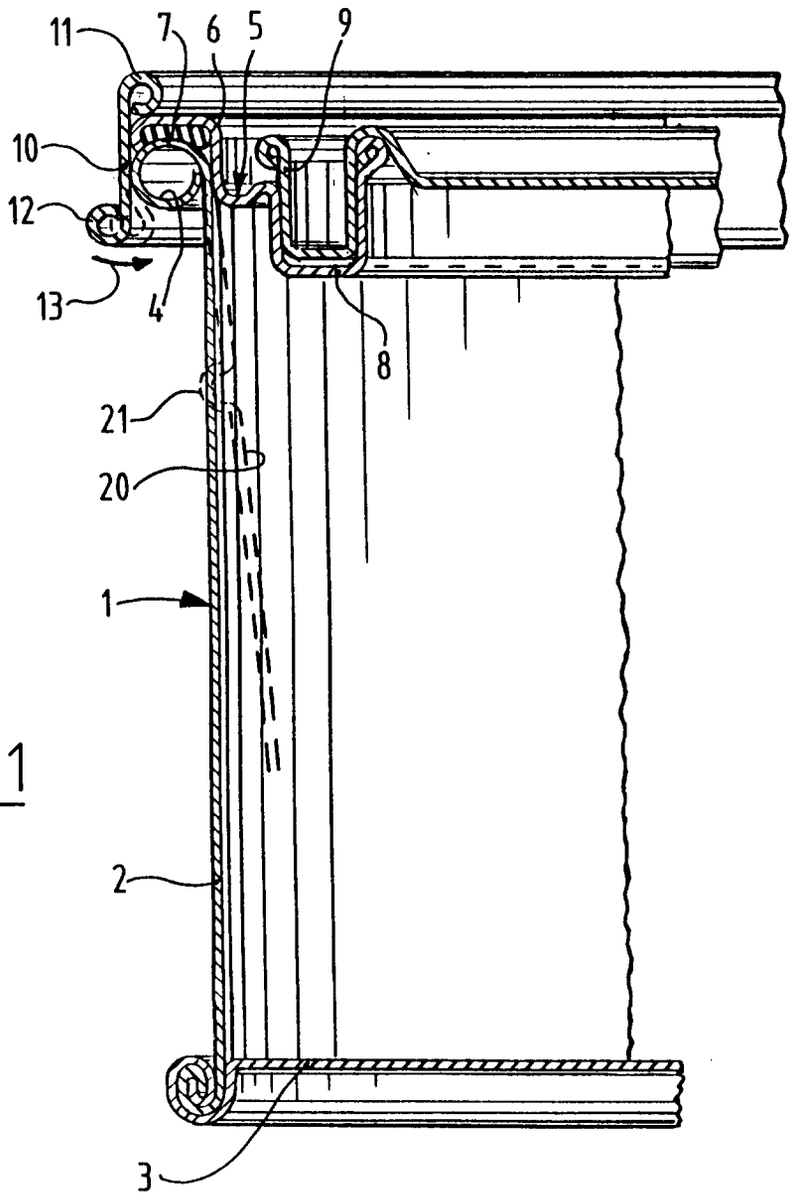


FIG. 1

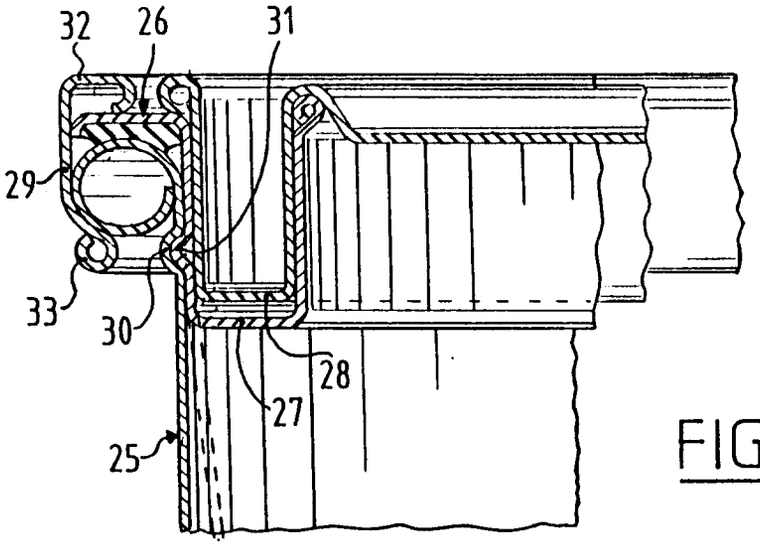


FIG. 3

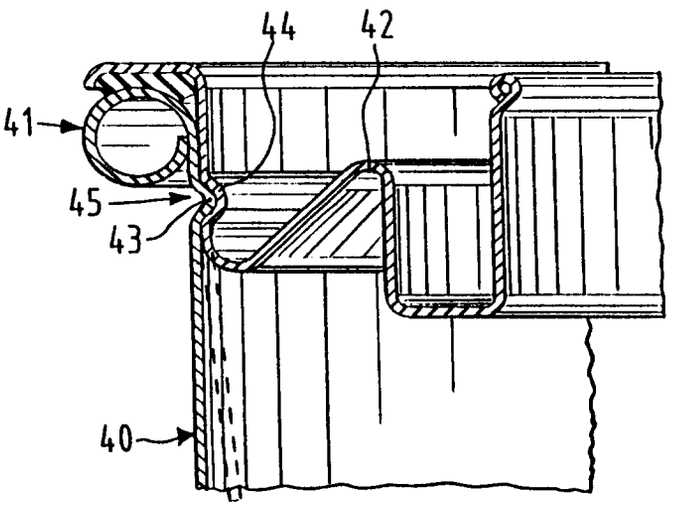


FIG. 4

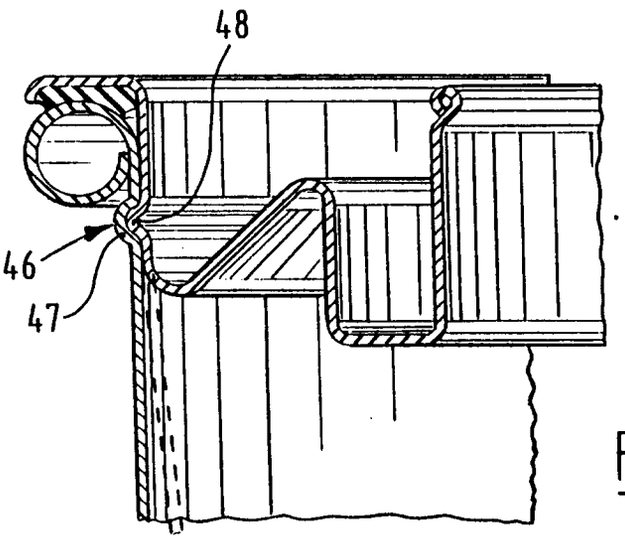


FIG. 5

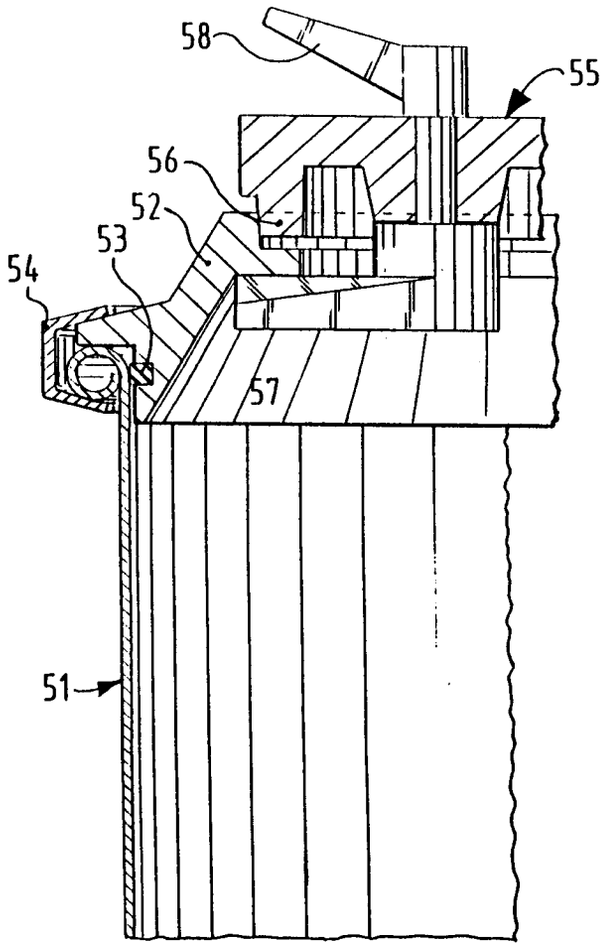


FIG. 6

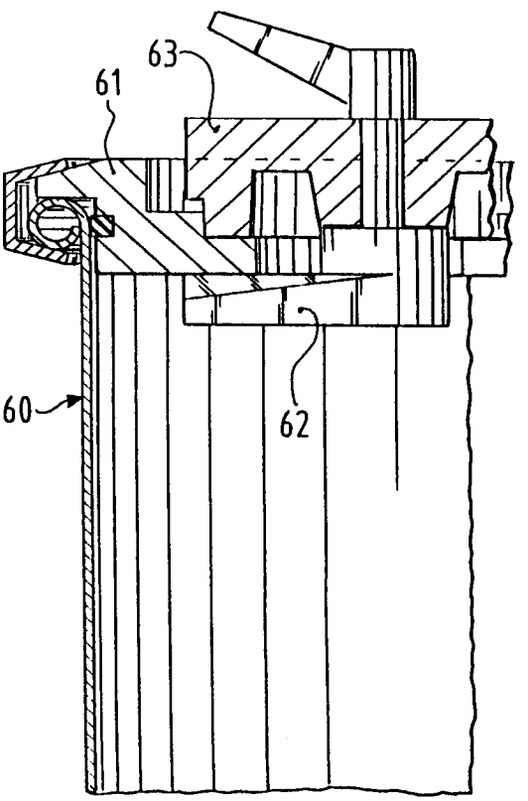


FIG. 7

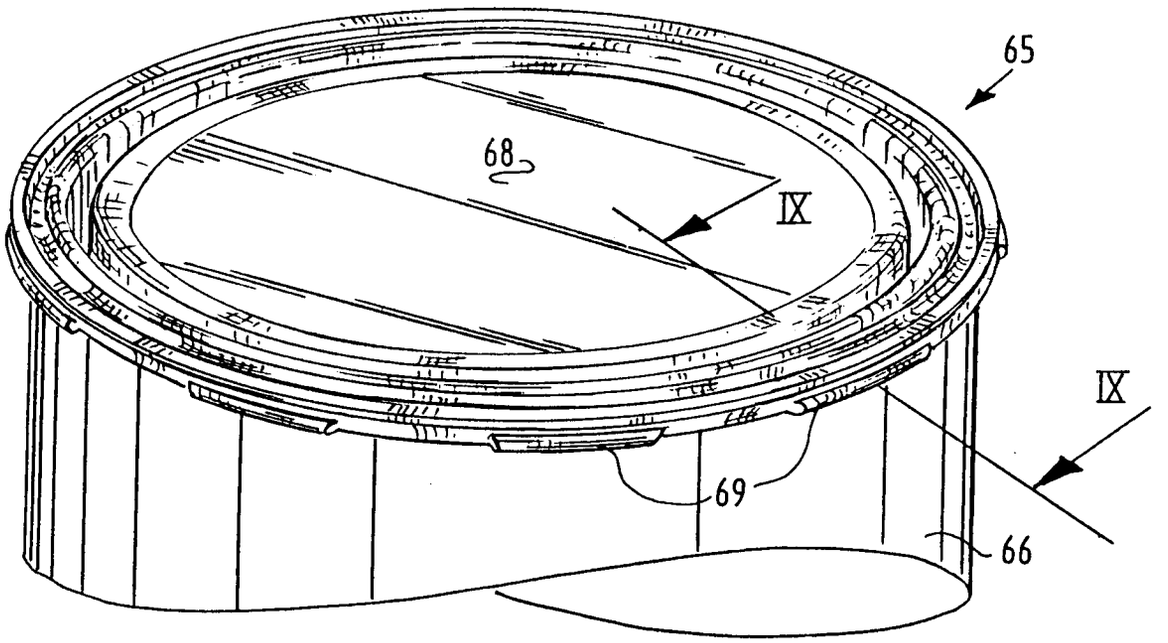


FIG.8

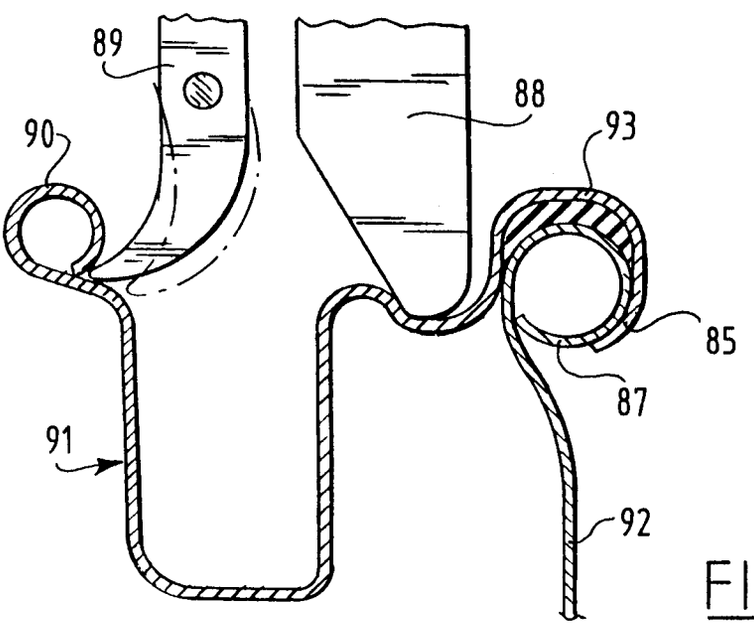


FIG.13

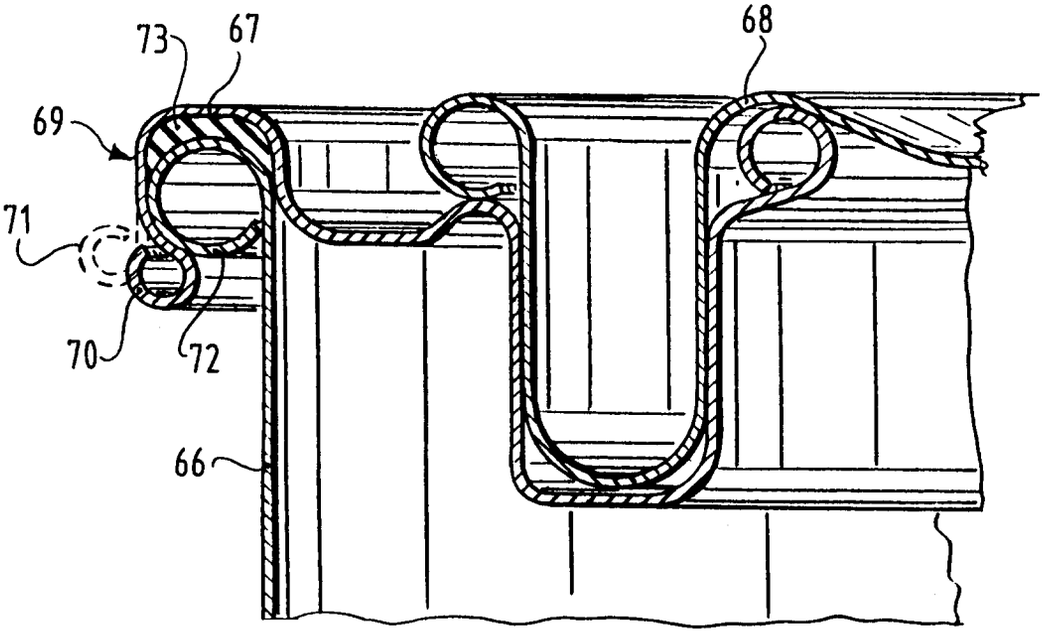


FIG.9

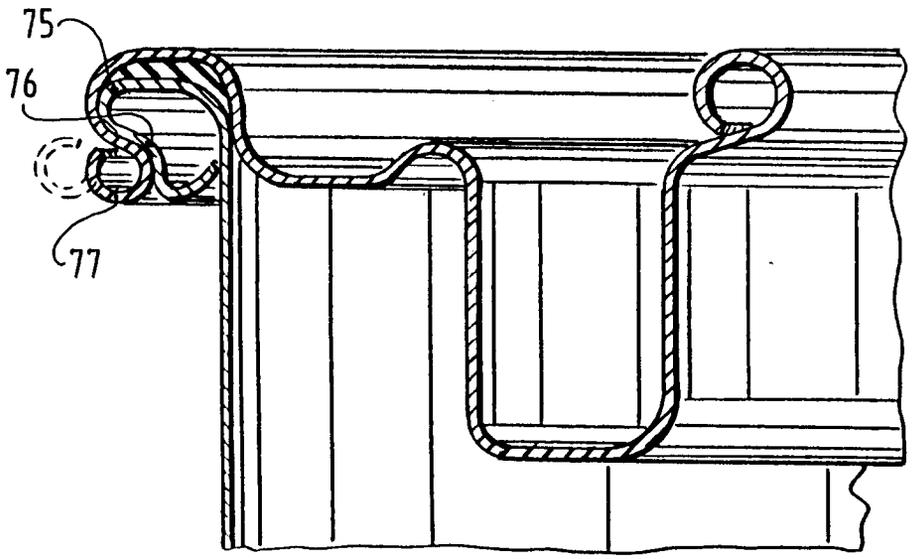


FIG.10

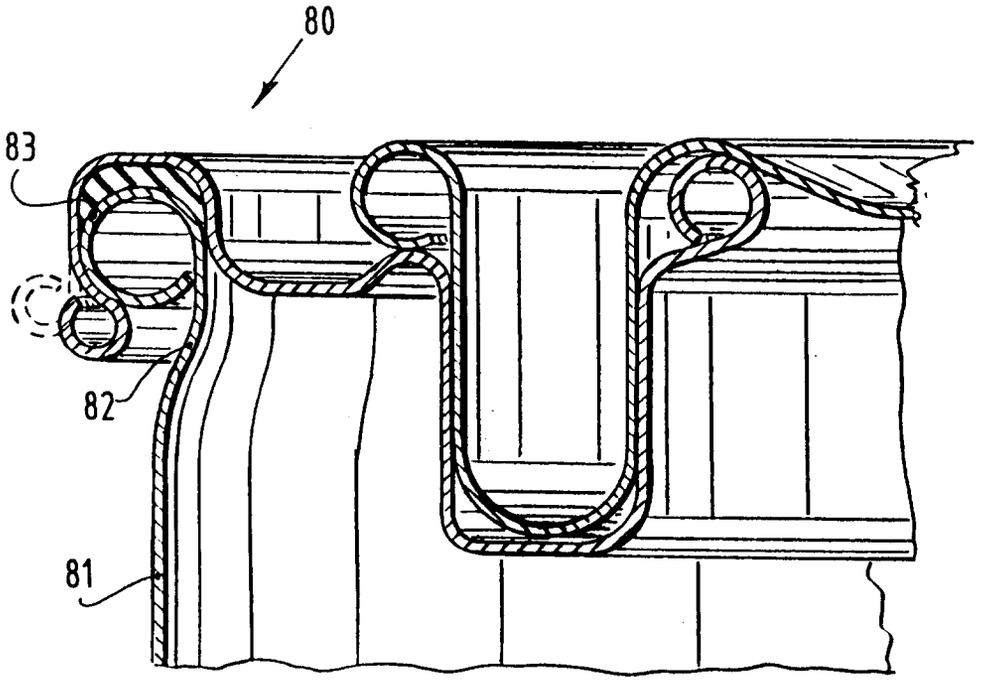


FIG.11

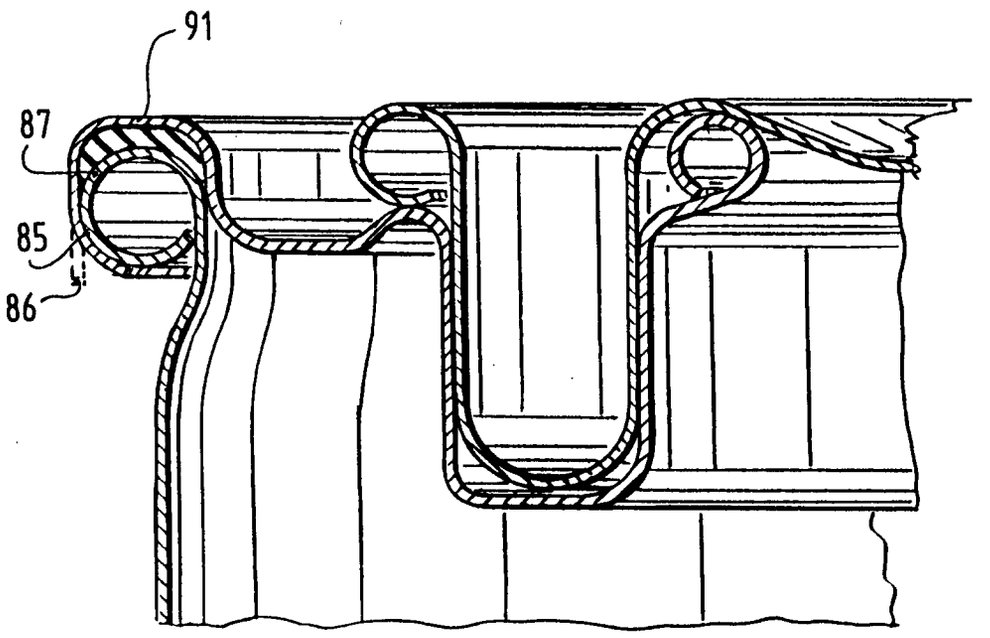


FIG.12