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(54) **SEALABLE CONTAINER**

ABDICHTBARER BEHÄLTER

CONTENANT POUVANT ETRE FERME HERMETIQUEMENT

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EP 1 127 010 B1

Description

[0001] The present invention relates to a sealable metal container. In particular, the invention provides a means for sealing a metal container which is not made to close tolerances, such as a biscuit tin.

[0002] In these types of three piece metal containers, there are three areas where air can penetrate the container: The end seam, between the base and the body of the container; the side seam, where the two ends of the side wall join; and the opening between the lid and the body of the container. Usually, the end and side seams are made by forming a hook on the edges of the relevant pieces of metal and then folding these hooks together to form a "clinched" seam. Such seams are unlikely to be airtight. To increase the airtightness of the end seam, lining compound may be provided inside the seam to form a gasket. Cement or solder may be used to strengthen the side seam and make it airtight.

[0003] The opening in the body for the lid is the normal access point to the container. The material used for metal containers, such as biscuit tins, is not normally deformable enough to ensure a mechanical seal by engagement of lid with the body of the tin. However, a number of different methods are already used to seal the opening of these containers.

[0004] In some applications, a thin membrane of aluminium foil, plastic laminate or impervious film is heat sealed across the opening in the body of the tin or across an insert arranged inside the tin to hold the contents. This membrane indicates tamper evidence but has the disadvantage that once the membrane is broken on opening, the lid does not give an effective, continuing, airtight seal and the contents of the tin will gradually start to deteriorate. Even before the film has been torn away from the insert, the product compartment is unlikely to be airtight as the material at the corners of the compartment is often very thin and can leak. Furthermore, some products are adversely affected by the heat sealing process which has to be carried out once the tin has been filled.

[0005] Alternatively, a resilient, pliable gasket may be applied inside the lid so that it sits on top of the body, forming a seal when the lid and the body are closed together. A disadvantage of this arrangement is that some form of lid retention is necessary to apply pressure to the lid to maintain the seal, such as screw threads, clips or snap pins. Furthermore, this sealing arrangement requires additional processing steps, to insert the gasket into the lid. As the mechanical engagement between the lid and the body of the container is not sufficient to maintain the sealing force, this arrangement may not provide an adequate seal where the tolerances on the body and lid of the tin are relatively loose.

[0006] The simplest method of sealing the lid and the body together consists of externally applying a band of pliable, self-adhesive tape to the tin along the join between the lid and the body. However, this arrangement

is unlikely to provide an airtight seal. A further disadvantage of this arrangement is that the sealing tape has to be applied under tension. This means that the tin has to be substantially circular or oval, otherwise the tape will sag and an adequate seal will not be obtained.

[0007] Furthermore, once the tape is removed the lid alone will not provide an airtight seal, hence the tin cannot be resealed.

[0008] US-4,298,134 describes a paint can having a flexible plastic film bag liner. The liner is folded back and draped downwardly over the upper outside portion of the can. Two downwardly depending concentric rings on the paint can lid provide an liquid-tight seal.

[0009] The aim of the present invention is to provide an airtight metal container having a longer shelf life and which can be resealed by the consumer after initial opening.

[0010] Accordingly, the present invention provides a metal container comprising a body having an opening, a liner arranged within the body and a lid having an end panel and a depending skirt, arranged to engage the body around the opening, in which the liner has an extended portion which passes between the opposed surfaces of the body and the lid, characterised in that the extended portion has a biasing means to bias the liner against the lid to form a seal.

[0011] An advantage of this arrangement is that the liner will generally be retained in the container until the product carried therein is consumed. Hence, the tin will reseal when the lid is replaced on the container. Furthermore, by adapting the liner to form the seal, no additional components or processing steps are required and a packer merely has to fill the liner and close the lid onto the body of the container to obtain an airtight seal.

[0012] As the liner is shaped to fit the container, the container shape can be varied, whilst still retaining an airtight seal between the lid and the body of the container. Thus, the container may have concave surfaces as part of the side wall, as the seal formed by the liner will accommodate such surfaces. Therefore, contrary to the prior art tins using sealing tape to form a suitable seal, metal containers according to the invention may be made in a wide variety of shapes.

[0013] The liner may be made from a resilient plastics material, for example a soft thermoplastic such as polypropylene or PVC or a suitable laminate. The liner may be injection moulded, provided as a thermoform or manufactured using any other suitable techniques.

[0014] The extended portion of the liner is configured so that it is biased against the lid when the lid is placed on the body. Resistance to the deformation of the liner shape provides the necessary sealing force. The liner material is preferably sufficiently soft to provide an airtight seal, but stiff enough to provide sufficient resistance to deformation and thereby biasing force.

[0015] The extended portion of the liner may take the form of a folded spring which is normally in an expanded configuration when the body of the container is open but

which is compressed when the lid is placed on the body of the container. Alternatively, a bead may be provided in the extended portion of the liner which is interposed between the lid and the body. The bead is compressed when the lid is placed on the body, to provide the required sealing force. Where necessary a configuration incorporating a combination of a bead and a folded section may be used.

[0016] When the container is full of product, the weight of the product will tend to ensure that the liner remains in the body of the container when the lid is removed. However, when the product has been partially consumed, the liner may become trapped in the lid when the lid is removed, due to the biasing force between the liner and the lid. Normally, the edge around the opening in the body is curled to remove sharp edges. Preferably, the liner according to the invention is provided with an indent which is arranged to co-operate with this curl to prevent the liner being removed from the container with the lid.

[0017] In known containers where the product is contained within an insert which is heat sealed by a membrane, it has been found that the thinner material around the bottom corners of the insert, tends to leak air, which enters the tin through the base and side seams. In many circumstances, this causes deterioration of the product. According to the invention, the liner and lid preferably provide a sealed envelope for the product, independent of the body of the container. In this arrangement, there is no need to ensure that the end seam and side seam of the container form a seal as the liner and lid together provide a sealed, airtight compartment for the product. This simplifies the manufacturing process and removes the requirement for expensive cement or lining compound.

[0018] Increased force will usually be required to break the airtight seal between the lid and the body of the container. In order to assist removal of the lid, the liner or a portion thereof may be extended below the level of the lid by a sufficient amount that the liner can be pulled upwards to assist in the removal of the lid. Alternatively, the lid may be provided with an extended tab or lip under which a consumer can place their fingers to lever the lid off the body of the container.

[0019] Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a cross sectional view of a three piece biscuit tin and liner according to the invention. Figure 2 shows an expanded view of the sealing assembly of the tin shown in figure 1.

Figure 3 shows a first sealing arrangement according to the invention with the liner in an expanded, non-sealing configuration, before the lid has been placed on the body of the tin

Figure 4 shows the sealing arrangement of figure 3 after the lid has been placed on the body, with the

liner in a compressed configuration, forming a seal between the lid and the body.

Figure 5 shows a second sealing arrangement according to the invention, with a sealing bead on the liner in an expanded, non-sealing configuration, before the lid has been placed on the body of the tin. Figure 6 shows the sealing arrangement of figure 5 after the lid has been placed on the body, with the sealing bead in its compressed configuration, forming a seal between the lid and the body.

Figure 7 shows an embodiment of the invention in which the liner is provided with a recess arranged to engage with an internal curl around the opening in the body, to prevent the liner being removed from the body when the lid is opened.

Figure 8 shows a similar embodiment of the invention to figure 7, but with the liner recess adapted to engage with an external curl around the opening in the body.

Figure 9 shows an embodiment of the invention in which the liner has an extended tongue, to assist opening of the tin.

Figure 10 shows an alternative embodiment of the invention in which the lid has a radially extended rim, to assist opening of the tin.

In all the figures, like components have been given the same reference numerals.

[0020] Referring to figures 1 and 2, a biscuit tin 10 according to the invention comprises a lid 20, a body 30 and a liner 40, arranged within the body. The lid 20 has an end panel 21 and a depending skirt 22 which engages the opening in the body 30. The lid 20 may also be provided with an upstanding bead 23 to assist stacking of the biscuit tins. The body 30 comprises a side wall 31 and a base panel 32, joined by a clinched seam 33. The side wall 31 is provided with a circumferential bead 36 which is located just below the depending skirt 22 of the lid 20. The circumferential bead 36 provides rigidity to the body 30 and protects the biscuit tin 10 against impact. In particular, the bead 36 reduces accidental opening of the lid 20 when subjected to an oblique impact. As shown in more detail in figure 2, the liner 40 is extended over the curled edge 35 of the opening in the body 30 and is trapped between the depending skirt 22 of the lid 20 and the side wall 31 of the body 30 to provide an airtight seal 45.

[0021] Referring to figures 3 and 4, in a first embodiment of the sealing arrangement, the liner 40 is provided in the form of a folded spring. The extended portion of the liner 40 is initially in an expanded configuration 41 when the biscuit tin is open. When the lid 20 is placed over the opening in the body 30 of the tin, the extended portion of the liner 40 is forced into a compressed configuration 41' by the lid. However, the resilient liner configuration resists moving to the compressed configuration 41', thus biasing the liner 40 against the depending skirt 22 of the lid 20. This biasing force provides the seal-

ing force required to provide an airtight seal 45 around the opening in the tin.

[0022] Figures 5 and 6 show an alternative embodiment of the sealing arrangement, in which the extended portion of the liner 40 has a bead 42. The bead 42 is initially in an expanded configuration (as shown in figure 5), before the lid 20 has been placed on the body 30. However, when the lid 20 is placed on the body 30, the depending skirt 22 of the lid 20 compresses the bead 42'. Again, the bead configuration 42, 42' is such that the bead resists this deformation, biasing the liner 40 against the depending skirt 22 of the lid 20 and forming an airtight seal 45.

[0023] Due to the strong seal between the liner 40 and the lid 20, the liner may be retained within the lid 20 when the lid is removed from the body 30 of the tin. As shown in figures 7 and 8, in order to prevent removal of the liner 40 from the body 30 when the lid 20 is opened, the liner 40 may be provided with an indent 43 which cooperates with the curl 35 around the opening in the body 30. Depending upon whether the body has an internal curl 35 (as shown in figure 7) or and external curl 35 (as shown in figure 8), the indent 43 in the liner 40 will be arranged on the inside or outside the body 30 of the tin.

[0024] Finally, due to the sealing engagement between the lid 20 and the body 30 of the tin, it may prove necessary to provide a means of applying mechanical advantage to prise the lid 20 off the body 30. Referring to figure 9, the extended portion of the liner 40 may be extended even further below the curl 25 at the edge of the depending skirt 22 of the lid 20. The extended liner tongue 46 may either be provided around the whole periphery of the tin or at one location. In order to remove the lid 20 from the body 30 of the tin, the liner tongue 46 is lifted and thereby prises the lid 20 off the body 30.

[0025] Alternatively, as shown in figure 10, the lower edge of the depending skirt 22 of the lid 20 may be radially extended to provide a lip 26, either locally or around the whole periphery of the lid 20. The consumer can then place their fingers under the lip 26, to apply mechanical advantage to assist lever the lid 20 off the body 30.

[0026] In the above description of the invention, each feature has been described independantly. However, it will be apparent to one skilled in the art that many of the features described may be combined to enhance the sealing arrangement or otherwise improve the performance of a sealable tin according to the invention.

Claims

1. A metal container (10) comprising a body (30), having an opening, a liner (40) arranged within the body (30) and a lid (20) having an end panel (21) and a depending skirt (22), arranged to engage the body (30) around the opening, in which the liner (40) has an extended portion which passes between the op-

posed surfaces of the body and the lid, **characterised in that** the extended portion has a biasing means to bias the liner (40) against the lid (20) to form a seal (45).

2. A metal container according to claim 1, wherein the liner (40) is a made from a plastics material.
3. A metal container according to claim 1 or claim 2, wherein the extended portion of the liner (40) has a folded configuration, having a first expanded shape (41) when the body is open and a second compressed shape (41') when the lid (20) engages with the body (30).
4. A metal container according to any one of claims 1 to 3, wherein the biasing means comprises a deformable bead(42), which is compressed (42') when the lid (20) engages with the body (30).
5. A metal container according to any one of the preceding claims, wherein the body (30) is curled around the opening and the liner (40) further comprises an indent (43) arranged to co-operate with the curl (35) to prevent the liner (40) being removed from the body (30) when the lid (20) is opened.
6. A metal container according to any one of the preceding claims, further comprising an opening means to provide mechanical advantage to assist in breaking the seal and thereby allow removal of the lid from the container.
7. A metal container according to claim 6, wherein the opening means is provided by a tongue (46) on the liner arranged to be accessible on the outside of the container, whereby lifting the tongue (46) assists in breaking the seal.
8. A metal container according to claim 6, wherein the opening means is provided by a radially extended lip (26) on the lid, which provides mechanical advantage when removing the lid from the container.

Patentansprüche

1. Metallischer Behälter (10) mit einem Grundkörper (30), der eine Öffnung, eine innerhalb des Grundkörpers (30) angeordnete Auskleidung (40) und einen Deckel (20) aufweist, der ein Abschlussfeld (21) und einen sich nach unten erstreckenden Kragen (22) aufweist, der mit der Maßgabe angeordnet ist, dass er mit dem Grundkörper (30) um die Öffnung herum im Eingriff steht, wobei die Auskleidung (40) einen ausgedehnten Abschnitt aufweist, der zwischen den einander gegenüberliegenden Flächen des Grundkörpers und des Deckel hindurch-

geführt ist, **dadurch gekennzeichnet, dass** der ausgedehnte Abschnitt ein Vorspannmittel aufweist, um die Auskleidung (40) gegenüber dem Deckel (20) unter Vorspannung zu setzen, um eine Dichtung (45) zu bilden.

2. Metallischer Behälter nach Anspruch 1, wobei die Auskleidung (40) aus einem Kunststoff besteht.

3. Metallischer Behälter nach Anspruch 1 oder 2, wobei der ausgedehnte Abschnitt der Auskleidung (40) gefaltet ist, und zwar sich in einer ersten expandierten Gestalt (41) befindet, sobald der Behälter geöffnet ist und in einer zweiten komprimierten Gestalt (41') befindet, sobald der Deckel (20) mit dem Grundkörper (30) im Eingriff steht.

4. Metallischer Behälter nach einem der Ansprüche 1 bis 3, wobei das Vorspannmittel aus einer deformierbaren Sicke (42) besteht, welche komprimiert wird (42'), sobald der Deckel (20) mit dem Grundkörper (30) im Eingriff steht.

5. Metallischer Behälter nach einem der vorangegangenen Ansprüche, wobei der Grundkörper (30) um die Öffnung herum eine Anrollung aufweist und wobei die Auskleidung (40) ferner eine Einkerbung (43) umfasst, die mit der Maßgabe angeordnet ist, dass sie mit der Anrollung (35) dahingehend zusammenwirkt, dass die Auskleidung (40) daran gehindert wird, aus dem Grundkörper (30) entfernt zu werden, sobald der Deckel (20) geöffnet wird.

6. Metallischer Behälter nach einem der vorangegangenen Ansprüche, gekennzeichnet ferner durch ein Öffnungsmittel, um einen mechanischen Vorteil bereitzustellen, der ein Aufbrechen der Dichtung und auf diesem Wege eine Entfernung des Deckels von dem Behälter unterstützt.

7. Metallischer Behälter nach Anspruch 6, wobei das Öffnungsmittel durch eine Zunge (46) an der Auskleidung bereitgestellt wird, die mit der Maßgabe angeordnet ist, dass sie auf der Außenseite des Behälters zugänglich ist, so dass mittels eines Anhebens der Zunge (46) ein Aufbrechen der Dichtung unterstützt wird.

8. Metallischer Behälter nach Anspruch 6, wobei das Öffnungsmittel durch eine radial ausgedehnte Lippe (26) des Deckels bereitgestellt wird, welches einen mechanischen Vorteil beim Entfernen des Deckels von dem Behälter bereitstellt.

Revendications

1. Récipient en métal (10) comprenant un corps (30),

comportant une ouverture, une doublure (40) agencée au sein du corps (30) et un couvercle (20) comportant un panneau d'extrémité (21) et une jupe pendante d'un seul tenant (22), agencée pour engager le corps (30) autour de l'ouverture, dans lequel la doublure (40) comporte une partie prolongée qui passe entre les surfaces opposées du corps et du couvercle, **caractérisé en ce que** la partie prolongée comporte un moyen de sollicitation pour solliciter la doublure (40) contre le couvercle (20) pour former un joint d'étanchéité (45).

2. Récipient en métal selon la revendication 1, dans lequel la doublure (40) est faite d'une matière plastique.

3. Récipient en métal selon la revendication 1 ou la revendication 2, dans lequel la partie prolongée de la doublure (40) a une configuration pliée, comportant une première forme expansée (41) lorsque le corps est ouvert et une deuxième forme comprimée (41') lorsque le couvercle (20) s'engage avec le corps (30).

4. Récipient en métal selon l'une quelconque des revendications 1 à 3, dans lequel le moyen de sollicitation comprend une nervure déformable (42), qui est comprimée (42') lorsque le couvercle (20) s'engage avec le corps (30).

5. Récipient en métal selon l'une quelconque des revendications précédentes, dans lequel le corps (30) est roulé autour de l'ouverture et la doublure (40) comprend également un cran (43) agencé pour coopérer avec la partie roulée (35) pour empêcher que la doublure (40) soit enlevée du corps (30) lorsque le couvercle (20) est ouvert.

6. Récipient en métal selon l'une quelconque des revendications précédentes, comprenant également un moyen d'ouverture pour constituer un avantage mécanique pour aider à rompre le joint d'étanchéité et donc permettre d'ôter le couvercle du récipient.

7. Récipient en métal selon la revendication 6, dans lequel le moyen d'ouverture est constitué par une languette (46) sur la doublure, agencée pour être accessible sur l'extérieur du récipient, de manière que le soulèvement de la languette (46) aide à rompre le joint d'étanchéité.

8. Récipient en métal selon la revendication 6, dans lequel le moyen d'ouverture est constitué par une bordure s'étendant radialement (26) sur le couvercle, qui offre un avantage mécanique pour ôter le couvercle du récipient.

Fig.1.

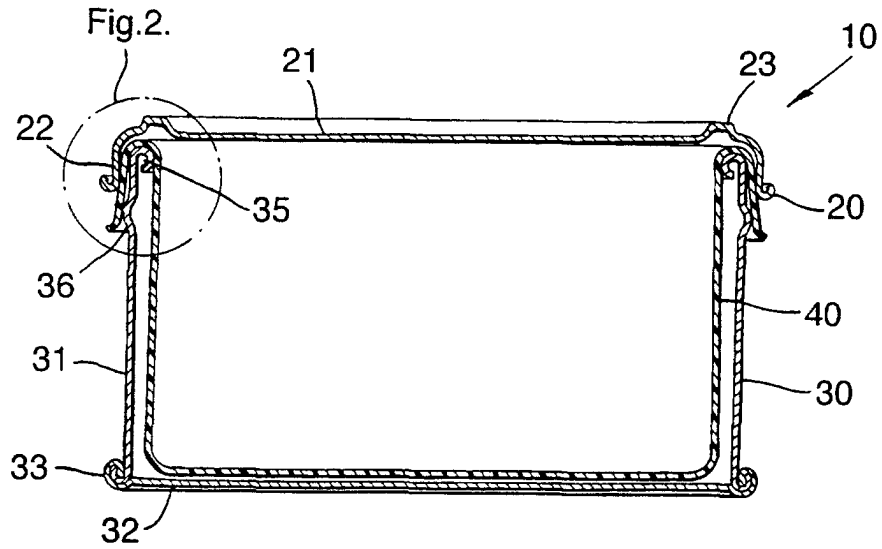


Fig.2.

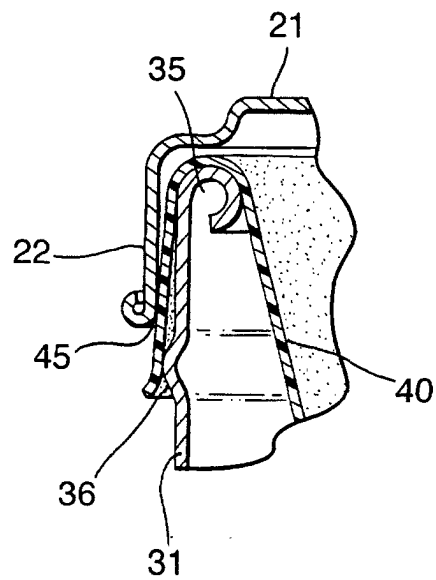


Fig.3.

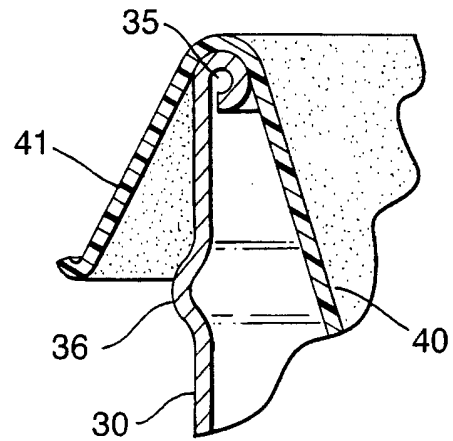


Fig.4.

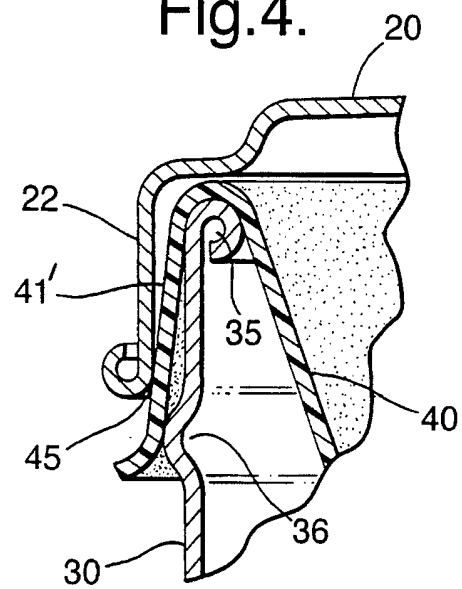


Fig.5.

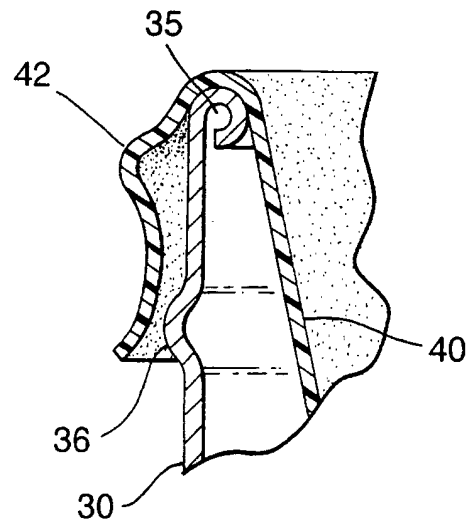


Fig.6.

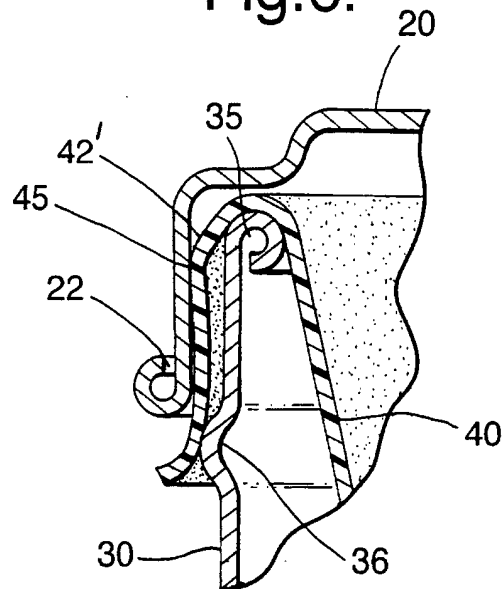


Fig.7.

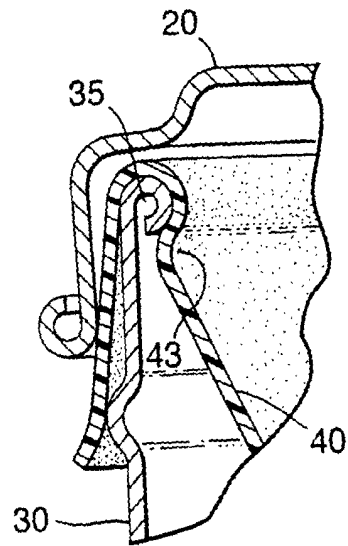


Fig.8.

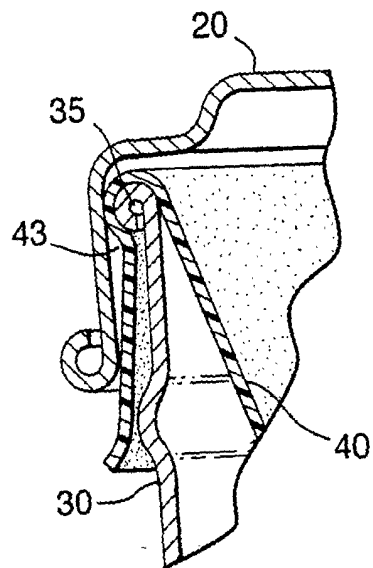


Fig.9.

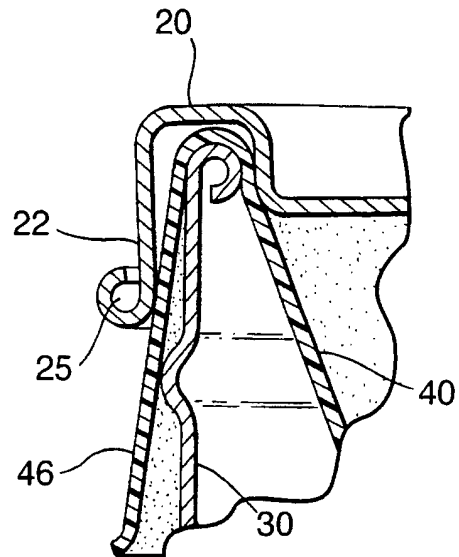


Fig.10.

