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(54) Container

(57) A container comprising a first part (16) and a second part (20) moveable into engagement with each other. The container has fastening means (18, 26) operable on moving the parts into engagement automatically to fasten the two parts together. In the assembled, closed container the fastening means is inaccessible so as to prevent the first part from being released from the second part.

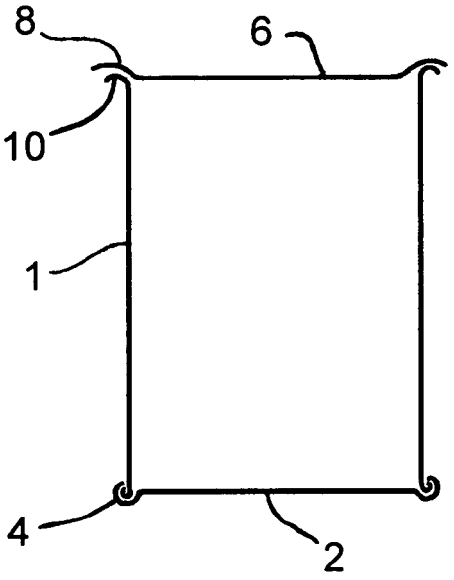

Fig. 1

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Description

Field of the Invention

[0001] This invention relates to containers, and is particularly applicable to the sealed two and three part containers which are commonly referred to as tin cans, the opening of which requires that a portion of the container be cut or torn.

Background to the Invention

[0002] A three piece tin can traditionally comprises a cylindrical wall and two ends, one of which constitutes the base of the can, the other the can lid. The base and cylindrical wall of the can are normally attached to each other by a process of seaming by the tin can manufacturer to provide an open topped can body. The open top can bodies are then supplied, with the lids as initially separate components, to the supplier of the item or substance, normally a food stuff, to be contained in the tin cans.

[0003] The supplier then fills the open top can body with the items/substance and attaches the lids to close and seal the cans. This act of attachment is achieved by seaming the lids to the can bodies, a process which requires the use of a seaming machine which curls the tin plate of the tin lid about a flange formed at the top of the body, and which crimps the two portions together to form the well known closed tin can. After closure, the can has to be cut open using a manual or mechanical can opener.

[0004] Tin cans have a variety of different shapes and sizes, and can also be of a two-part construction having a generally cupped shaped body portion and a lid.

[0005] It is common for a can to be used for the long-term storage of food and beverages. These products are generally put into the opened topped can bodies at or near boiling point. When a body has been filled, the lid is seamed onto the can to provide an airtight seal. When the contents cool, they contract and any steam in the can head space condenses, causing a partial vacuum inside the can. It is the lack of oxygen in the can head space that makes the tin can such a useful storage device.

[0006] Food and drink are canned in this way all over the world, as tin cans provide a relatively economic and efficient system for storing food for long periods, at ambient temperatures and without any significant loss of quality of the contents.

[0007] A disadvantage of a known tin can is that the closing and sealing of the can involves a specialised seaming machine. In some cases the seaming machines are manually operated and are both slow and cumbersome to use. The application of lids can be achieved more rapidly using computer controlled automatic seaming systems, but these are very expensive.

Summary of the Invention

[0008] According to the invention, there is provided a container comprising a first part and second part, moveable into engagement with the first part, fastening means operable, on moving the second part into engagement with the first part, automatically to fasten the two parts together, wherein, in the assembled, closed, container, the fastening means is inaccessible so as to prevent the first part from being released from the second part.

[0009] Thus the invention provides a container the two parts of which can be fastened together without the need for any special fastening tool, such as a can seamer, but which cannot then be easily separated.

[0010] Preferably, at least part of the fastening means is resilient.

[0011] This provides a convenient way of achieving the automatic operation of the fastening means as the first and second parts are brought into engagement with each other. In effect, the fastening means causes the first and second parts to be latched together.

[0012] The fastening means may conveniently be internal to the assembled closed container. If the fastening means is within the container, it cannot be accessed to try to separate the first and second parts without gaining access to the container's interior. The container can be so configured that accessing the interior of the assembled, closed container would affect the integrity of the latter. This could be achieved, for example, if the assembled container has no preformed opening, so cannot be opened without creating a cut, tear or rupture in the container.

[0013] Preferably, the fastening means comprises a plurality of formations which, in use, engage each other.

[0014] Said formations may comprise a plurality of resilient protuberances on the first part and a bearing surface on the second part, which surface is, in use, engaged by the protuberances to fasten together the first and second parts.

[0015] Thus, the portion of the fastening means on the second part is of a relatively simple construction as it can comprise a single formation.

[0016] Preferably, the protuberances, in use, engage the bearing surface at regular intervals therealong.

[0017] The protuberances may conveniently comprise an array of teeth formed integrally with the first part. For example, the teeth may be formed by process or stamping the first part.

[0018] The bearing surface preferably comprises a lip on the second part.

[0019] Preferably, the lip is inturned and the protuberances are provided on a skirt on the first part, the skirt, in use, extending into the second part.

[0020] Where the first part includes said skirt, the protuberances may include one or more lobes in addition, or as an alternative, to the teeth mentioned above. Said lobes being integrally formed with said skirt. Preferably, the protuberances are constituted by an array of such lobes which are continuous with said skirt.

[0021] The lobes are less likely than teeth to be deformed into an unusable shape, and can be formed with-

out cutting into the skirt, so that the lobes can be used in environments in which cut in a container part may lead to oxidation problems.

[0022] Conveniently, the lobes are embossed on the skirt.

[0023] Preferably, portions of the skirt between the lobes are contoured (for example by being concave), so as to provide a resilient support of the lobes. Thus placing the two parts of the container together initially causes the lobes to be pushed inwardly, by the action of the lip, against the resilience of the skirt until each lobe engages the other side of the lip and is then urged thereagainst by the resilience of the skirt to hold the two parts together.

[0024] The container preferably has a seal, which, in use, is sandwiched between the first and second parts to seal the container.

[0025] Preferably, the seal is resilient, and the fastening means holds the first and second parts together against the resilience of the seal to provide the necessary contact force to achieve said sealing of the container.

[0026] The seal may conveniently be carried on the underside of the first part.

[0027] The container is preferably cylindrical, preferably a can, in which the second part constitutes the container body, and the first part constitutes the container lid.

Brief Description of the Drawings

[0028] The invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a elevational side view of a conventional three-part tin can before the top end (herein referred to as "lid") is seamed onto the can body;

Figures 2 and 3 are detailed side elevational views of two forms of lid, prior to said seaming, one with an additional seal, the other without;

Figure 4 is a view corresponding to Figure 1, showing the can with the lid seamed into position;

Figure 5 is a more detailed view of the can of Figure 4, showing the seamed connection between the lid and the can body;

Figure 6 is a sectional side view of part of a can body and a can lid which constitute a container in accordance with a first embodiment of the invention;

Figure 7 is a more detailed side elevational view of the lid of the container shown in Figure 6;

Figure 8 is a detailed view of the lid of Figure 7 when retained on the body of the container shown in Figure 6;

Figure 9 is a sectional side view of a can lid which constitutes a part of a container in accordance with a second embodiment of the invention;

Figure 10 is a sectional plan view of that lid, taken along the line A-B of Figure 9;

Figure 11 is a sectional plan view of that lid, taken alone the line C-D of Figure 9;

Figures 12-14 are fragmentary radial sections of the lid, along the lines E, F and G respectively;

Figure 15 shows a generally shield shaped lobe on the skirt of the lid of the second embodiment; and

Figure 16 is a detailed view, corresponding to Figure 8, of part of the lid and body of the second embodiment of container.

Detailed Description

[0029] The type of prior art can shown in Figures 1-5 is of a three part construction and is supplied by the manufacturer in a part assembled form, as shown in Figure 1.

[0030] The can comprises a circular cylindrical wall 1 attached to a circular end piece 2 which, with the can orientated as shown in Figure 1, constitutes the base of the can. The base and wall are attached to each other by means of a peripheral circular seam or rim 4. The parts 1 and 2 constitute the can body which, after filling, can be closed by applying a circular lid 6 to the top of the wall 1. This is achieved in a similar fashion to the method of attachment to the base 2 to the wall 1. The lid 6 has a peripheral annular gutter 8 which is brought into close contact with a flange 10 formed at the end of the wall 1. These two parts are then bent together in a seaming machine so that the flange 10 bends through an angle of 180° and the gutter portion 8 through an angle of 270° This creates a seam, as shown at 12 in Figure 5, in which five thicknesses of metal are clasped together sufficiently tightly to provide a dry joint that does not need to be welded or soldered. Generally, the seams 4 and 12 provide an airtight seal, although the gutter 8 can sometimes be provided with an annular sealant lining, e.g. as shown at 14 in Figure 3.

[0031] Once the can is formed, with both ends 2 and 6 attached to the body 1, it cannot readily be opened without cutting the can (for example with a can opener) or in some other way visibly affecting the integrity of the tin. Accordingly, any tampering of the tin can, for example to alter the contents after it has been filled and sealed, will generally have a noticeable effect on the can's appearance, and therefore give rise to clear visual evidence of tampering. However, as indicated above, a seaming machine is needed to curl the outer edge of the lid 6 about the flange 10 in order to attach the lid 6.

[0032] With reference to Figure 6-8, a can in accord-

ance with a first embodiment of the invention has a cylindrical wall 16 and circular base (not shown) which constitute the can body. The base is identical to the base 2 and the lower portion of the wall 16 is identical to the corresponding portion of the wall 1, the base and wall 16 being attached to each other in an identical fashion to the attachment of the base 2 to the wall 1.

[0033] However, the top of wall 16 differs from the wall 1 in that it is curled inward on itself, towards the axis of the tin, to provide an inturned annular lip 18.

[0034] The can has a lid 20 formed from a circular piece of sheet material, such as aluminum or tin plated steel (or any other suitable material) the outer periphery of which is bent to form an annular down turned gutter 22 from which an annular skirt 24 depends.

[0035] Projecting upwardly and outwardly from the skirt 24 is an array of equi-angularly spaced trapezoidal teeth, all of which are denoted by reference numeral 26. The teeth are formed by stamping the material to form the skirt 24 prior to the bending of the lid 20 into shape.

[0036] The gutter 22 also carries a resilient annular seal 28 which in this example is formed from latex.

[0037] After the can body has been filled, the attachment of the lid can be achieved simply by pressing the lid 20 onto the open end of the can body. The diameter of the skirt 24 closely corresponds to the inner diameter of the lip 18 so that this action causes the teeth 26 resiliently to deform inwardly as they move past the lip 18 and then to spring out once the outer, top edges of the trapezoidal teeth 26 have passed the underside of the lip 18. This results in the trapezoidal teeth 26 engaging the underside the lip 18, as shown in Figure 8, to retain the lid 20 on the can body. Since the trapezoidal teeth 26 are then on the interior of the can, it is not possible to push the trapezoidal teeth 26 inwardly towards the can axis so that they clear the lip 18 and allows the lid 20 to be removed. Consequently, the can has to be opened in a similar fashion to a conventional can, for example using a can opener or the like, so that any tampering of the contents of the can will produce visible evidence, for example a tear, cut or puncture. In addition the teeth 26 urge the lid 20 and lip 18 together to compress the annular seal 28, and thus provide an airtight seal between the lid 20 and the can body.

[0038] It will be appreciated that, although the above description refers to a tin can, the invention is not limited to containers of any particular type of material, and is applicable to containers of any suitable material, for example a metal, alloy, plastics or composite material. In addition, it is within the scope of the invention for the container to be of a shape other than cylindrical. A container in accordance with the invention can be provided with or without an easy-open-end. Such an easy open end may for example comprise a metal or plastic overcap.

[0039] A container in accordance with the invention can be used in a domestic situation or by a small occasional users of canning. It is of particular relevance to the third world where food is in short supply and canning facilities are scarce.

[0040] Although the container of the invention has been described in relation to the need to contain food, it will be appreciated that tin cans, including containers in accordance with the invention, can be used to contain items or substances which do not need to be hemetically sealed. For example, teddy bears, mugs or even underpants could be packaged inside a can, which in these circumstances is merely a novel form of packaging. If the container in accordance with the invention is used in this way, the latex seal 28 is not required.

[0041] Referring to Figures 11-16, the second embodiment of container in accordance with the invention has many features which are the same as or similar to corresponding features of the first embodiment, and these are denoted by the reference numerals used in Figures 6 to 8, raised by 100.

[0042] In particular, the second embodiment comprises a tin can having a cylindrical body 116 which is identical to the body 16 of the first embodiment and which thus includes an inturned lip 118 that cooperates with a skirt 124 depending from a lid 120 to fasten the lid onto the body 116 and thus to close the container. As with the first embodiment the skirt 124 is not externally accessible when the lid 120 is fastened onto the body 116, so that the lid 120 cannot then be removed without cutting into the can. However, instead of teeth, the skirt 124 is embossed to define protuberances in the form of six equangularly spaced lobes 150. Figure 15 is a front elevational view of such a lobe, from which it can be seen that the lob includes a substantially flat upper edge 152 and two convex sides 154 and 156 which converge at a lower point 158, so that each lobe is in the form of a generally shield shaped bulge in the skirt 124. Each of the lobes 150 is flanked by a respective pair of vertical portions of the skirt 124. Two of those portions are denoted by reference numerals 160 and 162.

[0043] The lobes 150 and their associated vertical portions of skirt are separated from each other by six concaved portions 164 of the skirt 124. These portions can be more clearly seen in the section of Figure 10, which is taken along a line below the lower tips of the lobes 150.

[0044] As with the first embodiment, the attachment of the lid 120 can be achieved by simply by pressing the lid onto the open end of the can body. As the lower tips (e.g. 158) of the lobes 150 come into contact with the lip 118 of the body, the lobes 150 begin to act as camming members which cause a radial compressive force to be exerted on the skirt 124. This causes the concave portions 164 to flex, against the resilience of the skirt, to allow radial inner movement of the lobes against the biasing force, derived from the skirt's resilience. Once the upper edges (e.g. 152) of the lobes 150 pass the lower edge of the lip 118, the resilience in skirt 124 pushes the lobes 150 radially outwards so that the upper edges (e.g. 152) are then in engagement with the underside of the lip 18, as shown in Figure 16, to retain the lid 120 of the can body 116.

[0045] The seal between the lid 120 and the body 116 is enhanced by means of a resilient annular seal 128 which functions in the same way as the seal 28 of the first embodiment. However, in order to enhance the retaining effect of the lobes, the gutter 122 has a substantial vertical outward portion 170 which in use extends beyond the bottom of the lid 118.

[0046] It will be appreciated that since the lobes are formed as bulges embossed into the skirt 124 they do not require any cutting of the skirt, the integrity of any anti-corrosive surface treatment of the lid 120 is not compromised by the creation of the lobes. In addition, the lobes cannot readily be broken off the skirt 124 prior to the attachment of the lid 120.

Claims

1. A container comprising a first part and second part, moveable into engagement with each other, fastening means operable, on moving the parts into engagement, automatically to fasten the two parts together, wherein, in the assembled, closed container, the fastening means is inaccessible so as to prevent the first part from being released from the second part.

2. A container according to claim 1, in which at least part of the fastening means is resilient.

3. A container according to claim 1 or claim 2, in which the fastening means is internal to the assembled, closed container.

4. A container according to any of the preceding claims, in which the fastening means comprises a plurality of protuberances on the first part and a bearing surface on the second part, which surface is, in use, engaged by the protuberances to fasten together the first and second parts.

5. A container according to claim 4, in which the protuberances, in use, engage the bearing surface at regular intervals therealong.

6. A container according to claim 4 or claim 5, in which the bearing surface comprises a lip on the second part.

7. A container according to claim 6, in which the lip is inturned and the protuberances are provided on a skirt on the first part, the skirt, in use, extending into the second part.

8. A container according to any of claims 4 to 7, in which the protuberances comprise an array of resilient teeth formed integrally with the first part.

9. A container according to either of claims 6 and 7 in which the protuberances comprise an array of lobes integrally formed with said skirt.

10. A container according to claim 9, in which said lobes are continuous with said skirt.

11. A container according to claim 10, in which the lobes are embossed on the skirt.

12. A container according to any of claims 9 to 11, in which the portions of the skirt between the lobes are contained so as to provide a resilient support for the lobes.

13. A container according to any of the preceding claims, in which the container has a seal, which, in use, is sandwiched between the first and second part to seal the container.

14. A container according to claim 13, in which the seal is resilient, and the fastening means holds the first and second parts together against the resilience of the seal to provide the necessary contact force to achieve said sealing of the container.

15. A container according to any of the preceding claims, in which the container is a tin can in which the second part constitutes the container body and the first part constitutes the container lid.

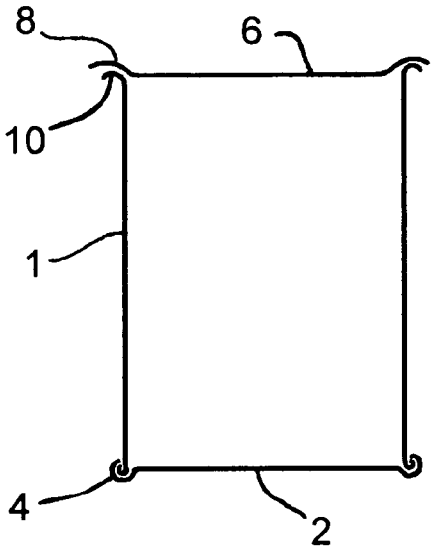


Fig. 1

Fig. 2

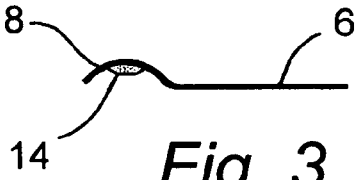


Fig. 3

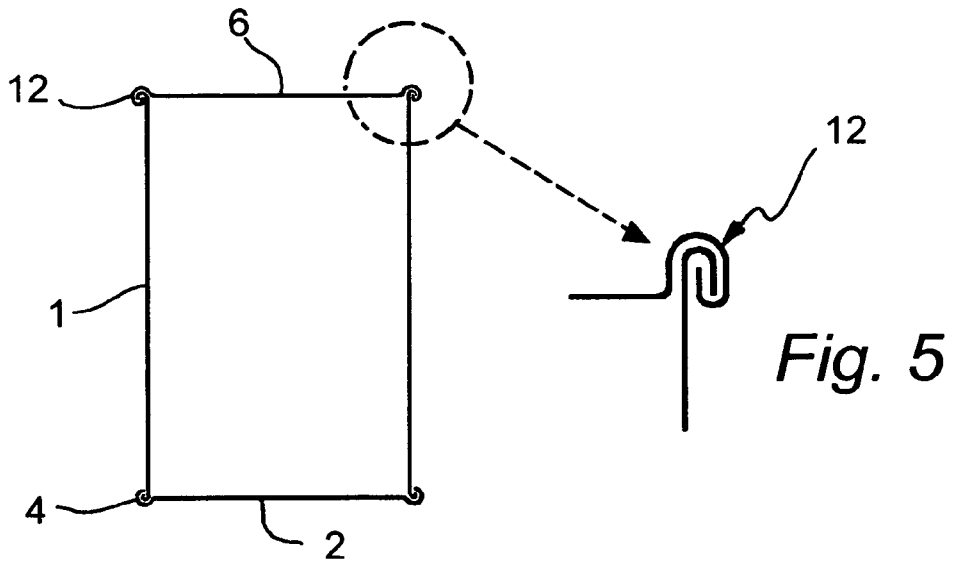


Fig. 5

Fig. 4

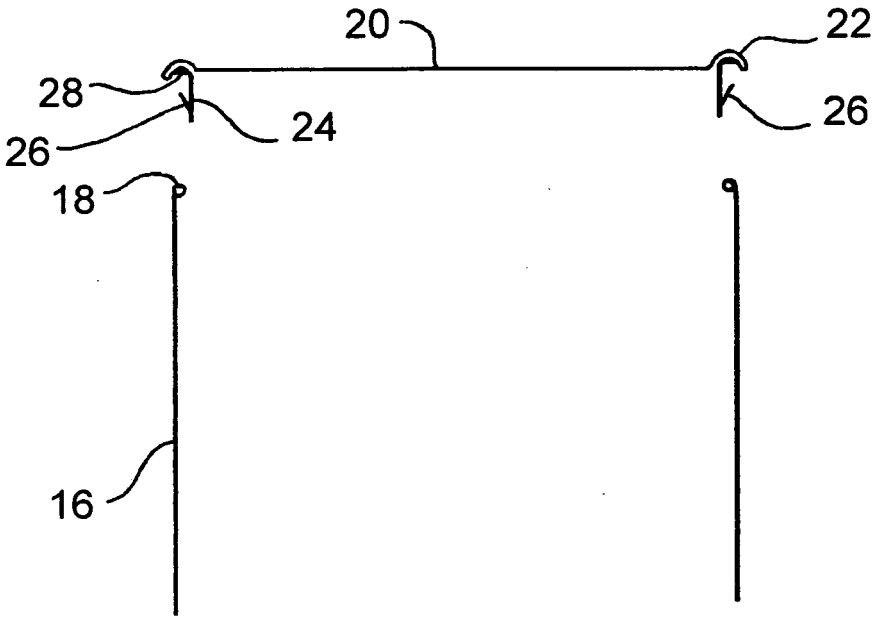


Fig. 6

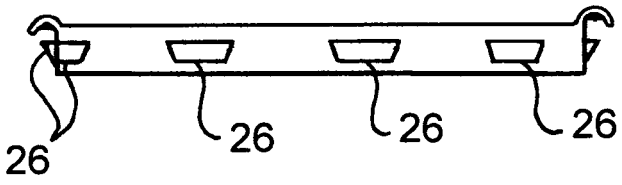


Fig. 7

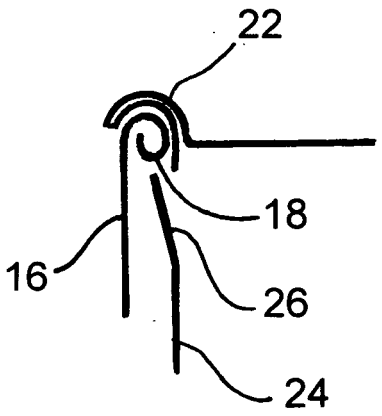


Fig. 8

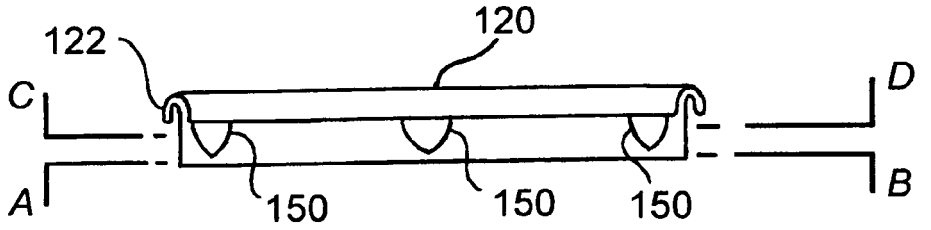


Fig. 9

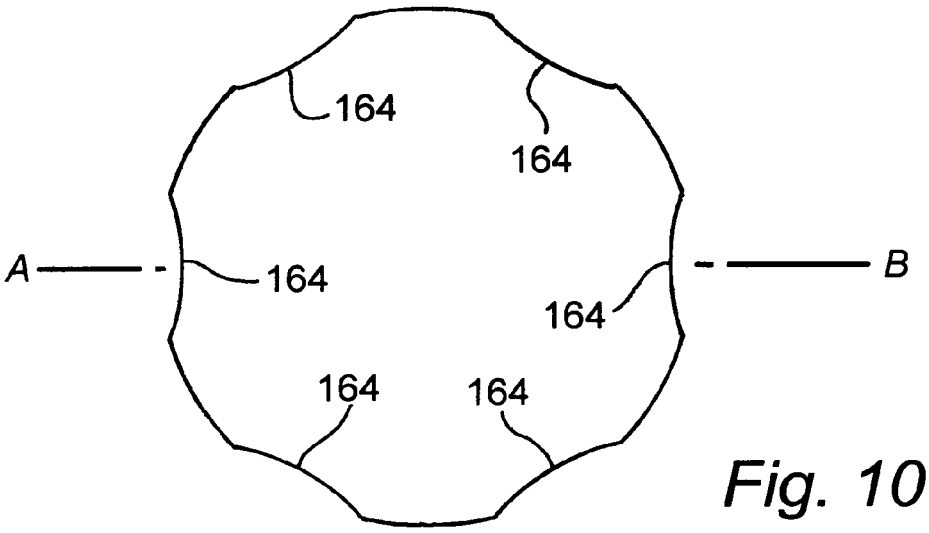


Fig. 10

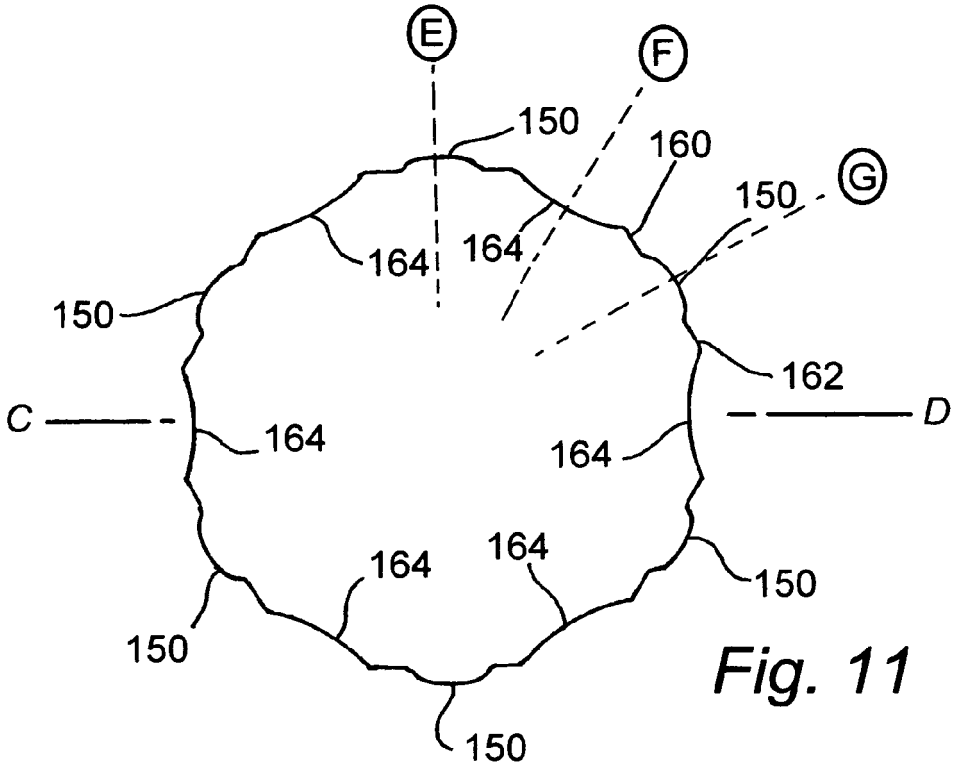
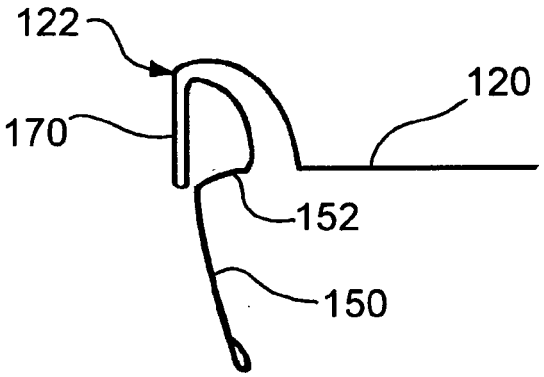
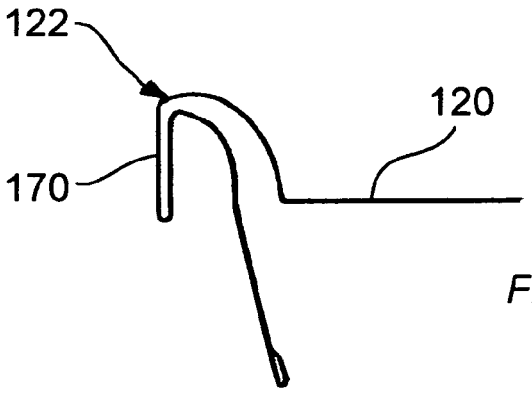


Fig. 11



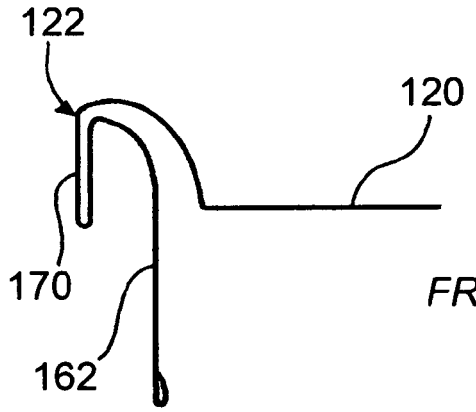
FRAGMENTARY RADIAL SECTION ALONG LINE (E)

Fig. 12



FRAGMENTARY RADIAL SECTION ALONG LINE (F)

Fig. 13



FRAGMENTARY RADIAL SECTION ALONG LINE (G)

Fig. 14

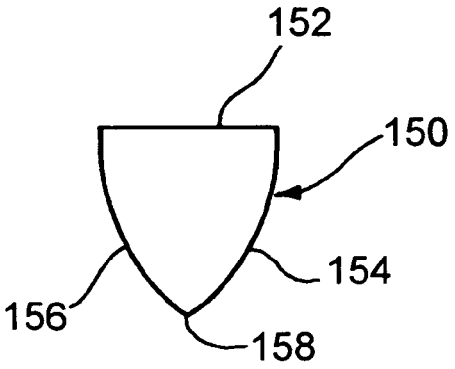


Fig. 15

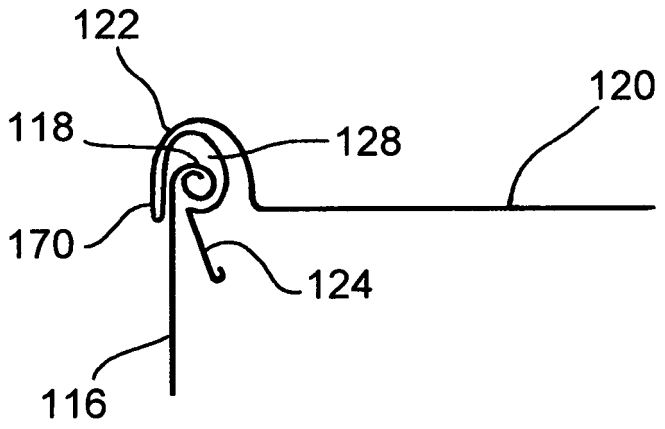


Fig. 16

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EUROPEAN SEARCH REPORT

Application Number
EP 09 25 2263

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	27 January 2010	Jervelund, Niels

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 25 2263

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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