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(54) **A container with a lid and a securing ring**

(57) A container comprises a container body (3) and a lid (5), which has an outer lid wall portion (29) surrounding a central portion. The outer lid wall portion (29) provides a lid-side sealing surface (39) and a lid-side securing portion (43), which engage respectively with body-side sealing surface and securing portion, when the lid (5) is applied to the container body (3) to close the container.

The container further comprises a securing ring (55) inserted within the outer lid wall portion (29). The securing ring (55) comprises a support portion (57) and possibly an upper flange portion (59) extending from the support portion (57) at an acute angle (α) of less than 80° from vertical. The securing ring (55) is attached to the lid (5) by an adhesive (64).

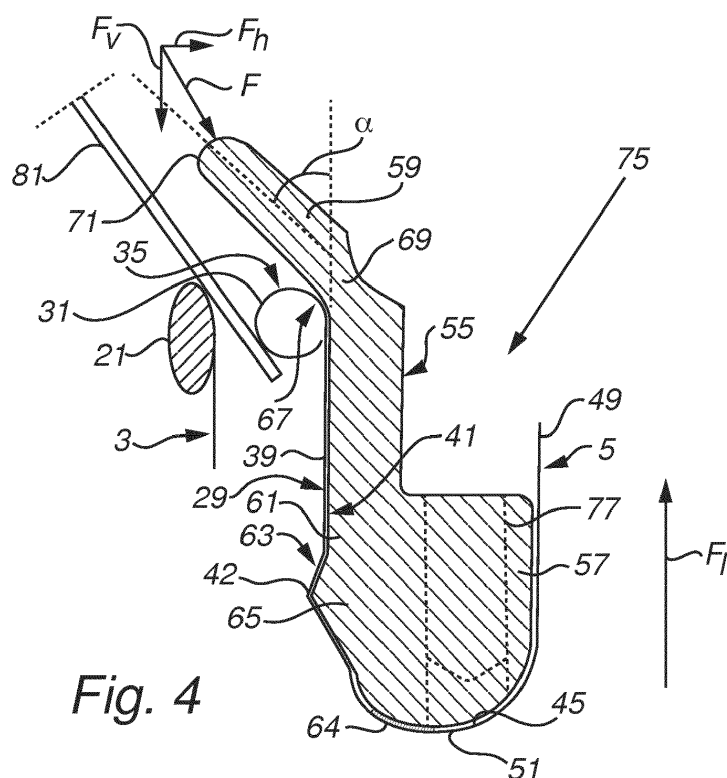


Fig. 4

Description

[0001] The present invention relates to a container comprising a container body and a lid, said container body having a bottom, a side wall and an opening at a top opposite the bottom, said opening having a closing area with a body-side sealing surface, said lid having a central portion and an outer lid wall portion, said outer lid wall portion being circumferential and surrounding the central portion, said outer lid wall portion providing on an outer side thereof a lid-side sealing surface, said lid-side sealing surface engaging with said body-side sealing surface, when the lid is applied to the opening of the container body to close the container, comprising a supporting portion accommodated within the outer lid wall portion.

[0002] A container of this art is known from WO-A-2013/041226, which discloses a container with a securing ring completely bridging a trough portion or circumventing U-shaped track of the lid to transfer the force of a possible blow against the upper rim of the container to the central portion of the lid, thereby protecting and stiffening the upper rim of the container including the lid. Further this prior art securing ring comprises a securing portion extending around and engaging the outside of the container body to secure the position of the lid on the container body. For opening the container the securing ring is initially removed.

[0003] Containers of the above art are e.g. used for transport and storage of liquids, such as paint, some of which are classified as dangerous, and accordingly the containers used for transport and storage thereof are subject to certification. To obtain a certificate the containers e.g. has to pass certain tests i.a. drop tests, whereby filled and closed samples of a given container are dropped from a given height at a given angle and whereby the samples must not leak. E.g. samples are dropped to land obliquely on the top rim from heights e.g. above 1 m whereby due to the inertia of the liquid inside the container an impulse will act on the inside of the lid tending to force the lid off the container body.

[0004] Different means are known for securing a lid on a container body, such means including a securing rings extending around and engaging the outside of the container body to secure the position of the lid on the container body, cf. e.g. the above WO-A-2013/041226, and the provision of resilient beads at the sealing surfaces and an adhesive adhering a bead at one sealing surface to the opposite sealing surface when the lid is applied to the container body, cf. WO-A-92/04248. Some prior art securing means are applicable simultaneously and some are not.

[0005] Most known securing rings are secured to the container by parts of the securing ring reaching over the upper edge of the container for snap engagement. Such securing is used by the securing ring disclosed in the above WO-A-2013/041226 though it is also suggested therein that the securing ring is snapped onto a contact

surface in the U-shaped track of the lid.

[0006] The object of the present invention is to provide a container with alternative or additional securing means securing the lid on the container body. Especially it is an object to provide a container with an alternative or additional means for securing the securing ring to the container.

[0007] This is obtained in accordance with the invention in that the securing ring is attached to the lid by an adhesive. In an embodiment a body-side securing portion diverging in a downwards direction is provided at the body-side sealing surface and a lid-side securing portion diverging in the downwards direction is provided at the lid-side sealing surface, said lid-side securing portion engaging with said body-side securing portion, when the lid is applied to the opening of the container body to close the container, said supporting portion having an outer portion comprising a third securing portion, and said third securing portion being arranged for engagement with an inner surface of the outer lid wall portion, at least spotwise distributed, along the inner circumference of said inner surface. When a container with a securing ring falls from a high position obliquely on its top rim the resulting impact against the top rim of the container will heavily deform said top rim. An effect of the securing ring is that the supporting portion supports the outer lid wall tending to keep the lid-side sealing surface and/or the lid-side securing portion in contact with the body-side sealing surface and/or the body-side securing portion, respectively. By the present invention it is obtained that the securing ring, in case of an impact against the top rim of the container, as mentioned, will stay mainly in its position to fulfil with greater certainty its function.

[0008] Body-side securing portions diverging in a downwards direction and lid-side securing portions diverging in the downwards direction for securing the lid in a closed position on the container body are known in a number of embodiments e.g. provided by inwardly or outwardly protruding bulges or beads, transitions between areas of different diameters, transitions between components etc., cf. DE-A-33 39 777, WO-A-92/04248, WO-A-96/32335, WO-A-98/35882, WO-A-2006/032539, WO-A-2013/041226, et al. The present invention is not limited to special embodiments of said securing portions, if such are present.

[0009] In an embodiment, said supporting portion is extending at least at a vicinity of a level of the lid-side securing portion. Hereby is obtained that the engagement of the lid-side securing portion with the body-side securing portion is more efficiently supported in case of an impact against the top rim of the container.

[0010] In an embodiment said third securing portion is arranged for engagement with an inner surface of the outer lid wall portion at the level of the lid-side securing portion and/or immediately adjacent the level of the lid-side securing portion. Hereby is obtained an enhancement of the surface pressure of the engagement between the lid-side securing portion and the body-side securing

portion. The engagement of the third securing portion with said inner surface may be direct or it may be via the adhesive.

[0011] In an embodiment said engagement of the third securing portion with the inner surface of the outer lid wall portion is continuous along the inner circumference of the inner surface.

[0012] In an embodiment the adhesive is elastic or viscoelastic in a set condition. Hereby small shifts between the supporting portion and the outer lid wall portion is provided for in case of an impact, whereby the force of the impact may be distributed circumferentially through the supporting portion to enhance the pressure of the supporting portion against the outer lid wall portion at positions away from the point of impact.

[0013] It should be understood that as used herein in relation to the container the terms "up" and "down" refers to the container in a normal upright position as standing on its bottom on a horizontal support. Further the terms "in" and "inner" on one hand and "out" and "outer" on the other hand refer to directions towards and away from a central vertical axis of the container, respectively, said vertical axis being vertical when the container is in a normal upright position such as standing on its bottom on a horizontal support.

[0014] Either of the container body and the lid may be made, at least primarily, of sheet metal, such as sheet steel. Especially the parts of the container body providing the body-side sealing surface and the body-side securing portion and/or the parts of the lid providing the lid-side sealing surface and the lid-side securing portion may be made of sheet metal, such as sheet steel.

[0015] The first and second sealing surface may be annular and have vertical extends. Especially the first and second sealing surface may be substantially vertical. The material of the securing ring is in an embodiment a plastics material such as polypropylene.

[0016] In an embodiment the supporting portion of the securing ring extends substantially to a horizontal wall portion adjacent the outer lid wall portion and said adhesive is positioned in the vicinity of the horizontal wall portion.

[0017] In an embodiment the inner surface of the outer lid wall portion has a downward diverging portion opposite the lid-side securing portion, and the outer portion of the supporting portion comprises at least one bead projecting outwardly to be in engagement with the downward diverging portion of said inner side, preferably the third securing portion comprises said at least one bead. Such feature provides for an enhancement of the surface pressure between the lid-side securing portion and the body-side securing portion in case of an impact against the upper flange portion.

[0018] In an embodiment a rim portion and an annular ledge is provided at an upper end of the outer lid wall portion, and the securing ring comprises an upper flange portion extending from the supporting portion above the annular ledge at an acute angle of less than 80° from

vertical. Hereby is obtained that the upper flange portion may act as a cushion absorbing a part of the energy from the impact, if the container falls upside-down. Further an impact against the upper flange portion will tend to drive the securing ring, at the circumferential area of impact and accordingly the lid, deeper down into its seat in the container body.

[0019] In a practical embodiment the upper flange portion is conical upwardly diverging and has a lower inner side connected integrally with the supporting portion and a free upper outer side. Hereby is obtained that a tool for opening the container may be inserted past the free upper outer side and below the rim portion of the lid while the security ring remain positioned on the lid, and that stacking of containers is not hindered by the upper flange portion.

[0020] In an embodiment the acute angle is less than 70°, and in a further embodiment the acute angle is in the range 35° to 55°.

[0021] In a practical embodiment the securing ring is further secured at the outer lid wall portion by engagement between the third securing portion and the inner surface of the outer lid wall portion.

[0022] In an embodiment the supporting portion of the securing ring fits within the outer lid wall portion with a tight fit. Hereby is obtained that the surface pressure between the lid-side securing portion and the body-side securing portion is enhanced and the effect of the security ring being at the other parts of the circumference outside the area of impact forced harder against the inner side of the outer lid wall portion is supported and enhanced.

[0023] In an embodiment a circumferential trough portion comprising an inner trough wall, a trough bottom and said outer lid wall portion is surrounding the central portion of the lid. In a further embodiment the supporting portion of the securing ring fits around the inner trough wall with a loose fit. Hereby is provided for the security ring to yield, at least slightly, towards the centre of the lid at the area of impact to support and enhance the effect of the security ring being at the other parts of the circumference outside the area of impact forced harder against the inner side of the outer lid wall portion, and the mounting of the security ring is facilitated.

[0024] In an embodiment the securing ring is recessed. Hereby is obtained a reduction of the amount of material used for the production of the security ring thus reducing costs and the security ring may be provided as a body with relatively small wall thickness which facilitates production of the security ring by injection moulding.

[0025] In an embodiment the adhesive is a hot-melt adhesive.

[0026] In an embodiment in which a circumferential trough portion comprising an inner trough wall, a trough bottom and said outer lid wall portion is surrounding the central portion of the lid, the securing ring is cast in situ in the trough portion. This provides for manufacture of a securing ring substantially filling the trough portion after setting.

[0027] In an embodiment the closing area is unilateral. By a unilateral closing area a closing are should be understood, in which a single, preferably substantially vertical, body-side sealing surface is in contact with a single lid-side sealing surface. Especially a unilateral closing area should be understood as opposed to a bilateral closing area in which a closing area of the container body is provided by a U-shaped groove structure and the closing area of the lid is a likewise U-shaped groove structure, whereby the U-shaped groove structure of the lid is inserted into the U-shaped groove structure of the container body, when the lid is applied to the container body, whereby two vertical sealing surfaces of the lid, separated by the bottom of the U-shaped structure, engages with corresponding two vertical sealing surfaces of the container body. Such bilateral closing areas are e.g. known from WO 2011/041826 A1, US 7 617 946 B2 and US 4 728 003.

[0028] In an embodiment the securing ring is a permanent securing ring. By permanent securing ring a securing ring should be understood that may remain seated on the lid when the container is opened by the lid being removed.

[0029] In the following the invention will be described in further detail having reference to the accompanying schematic drawings showing an example of an embodiment, wherein

Fig. 1 is a perspective view of a prior art container comprising a container body and a lid,
 Fig. 2 shows a section along the line II-II in Fig. 1,
 Fig. 3 is a view corresponding to Fig. 2 but showing the lid lifted from the container body,
 Fig. 4 shows schematically a securing ring according to the invention applied to the lid of Figs. 1 to 3,
 Fig. 5 is a top view of the securing ring,
 Fig. 6 is an enlarged section of the securing ring of Fig. 5,
 Fig. 7 is a view similar to Fig. 4, but showing a second embodiment of the invention, and
 Fig. 8 is a view similar to Fig. 3, but illustrating a third embodiment of the invention.

[0030] Figs. 1 to 3 show a container 1 with a container body 3 and a lid 5. The container body 3 has a side wall 7, a bottom 9 and an opening at the top 11 opposite the bottom 9. Further the container body 3 is provided with a handle 13. The container is in Figs. 1 to 3 shown in an upright position and terms like "up" and "down", etc. as used herein refer to the container in that position unless otherwise is specifically indicated.

[0031] The container body 3 has at its opening a closing area with a body-side sealing surface 15 and a body-side securing portion 17, the latter diverging in the downwards direction.

[0032] In the embodiment shown the closing area is provided by a ring 19 assembled with the material of the side wall 7 by means of a joint 21. The body-side securing

portion 17 is provided by a bend 23 of the material of the ring 19 at a transition 25 between the ring 19 and the side wall 7. In the alternative the closing area might be provided by folding the material of the side wall 7 at the top as it is known in the art.

[0033] In the embodiment shown the lid 5 has a central portion 27 surrounded by an outer lid wall portion 29. At an upper end of the outer lid wall portion 29 a rim portion 31 is provided by a more or less tightly rolled edge and an annular ledge 33 with an upturned surface portion 35 is provided by the material of the lid 5 being bend at the upper end of the outer lid wall portion 29.

[0034] The outer lid wall portion 29 has an outer side 37, a part of which provides a lid-side sealing surface 39, and an inner surface 41. The outer lid wall portion 29 is provided with a bead 42 which in the embodiment shown is projection outwardly i.e. away from central portion 27 of the lid and thus away from a central vertical axis of the container (not shown). The bead 42 provides a lid-side securing portion 43 diverging in the downwards direction.

[0035] At a lower end of the outer lid wall portion 29 a horizontal wall portion 45 is provided.

[0036] In the embodiment shown the lid 5 comprises a circumferential trough portion 47 surrounding the central portion 27, said circumferential trough portion 47 being provided by the outer lid wall portion 29, an inner trough wall 49 and a trough bottom 51, the latter thus providing in the present embodiment the horizontal wall portion 45.

[0037] At the closing area of the container and at the rim portion of the lid sealing beads 53 are provided as disclosed in WO-A-92/04248 to which document reference is made in that respect.

[0038] The body-side sealing surface 15 and the lid-side sealing surface 39 are both annular and extend substantially vertically in the present embodiment.

[0039] When the lid 5 is applied to the container body 3 to close the opening of the latter the bead 42 will slide over the body-side sealing surface 15 facilitated by elastic deformation of the material as it is well known in the art and the bead 42 will rest in the small hollow provided by the transition 25 between the ring 19 and the side wall 7, the lid-side securing portion 43 engaging with the body-side securing portion 17 to secure the position of the lid 5, and the lid-side sealing surface 39 will engage with the body-side sealing surface 15 in a sealing manner as it is well known per se in the art and as shown in Fig. 2.

[0040] In the embodiment shown the container body 3 and the lid 5 are both made of steel sheet. The inner surface 41 of the outer lid wall portion 29 has a depression 54 opposite the bead 42.

[0041] According to the present invention a securing ring 55 is applied to the lid 5 as shown in Fig. 4.

[0042] The securing ring 55 comprises a supporting portion or lower portion 57 and in this first embodiment also an upper flange portion 59. The lower portion 57 is accommodated within the outer lid wall portion 29 and the upper flange portion 59 extends above the annular

ledge 33 at an acute angle α (from vertical) which in the embodiment shown is approximately 45° . The lower portion 57 has an outer portion 61 comprising a third securing portion 63 (third to the body-side and lid-side securing portions that is). The third securing portion 63 engages the inner surface 41 of the outer lid wall portion 29 at the level of the lid-side securing portion 43 i.e. an area of said surface directly opposite the lid-side securing portion and immediately adjacent above.

[0043] The securing ring 55 is secured to the lid 5 by an adhesive 64, which in the present embodiment is placed at the transition between the trough bottom 51 and the outer lid wall portion 29. The adhesive 64 is in the embodiment shown an adhesive maintaining elastic or viscoelastic properties when set, such as a pressure sensitive hot-melt in the form of a synthetic rubber. Using a hot-melt facilitates manufacture. The adhesive may e.g. be applied as a continuous string or it may e.g. be applied as circumferentially spaced dots. The applied adhesive may be applied with an excess thickness to be flattened by the securing ring 55 when the latter is subsequently inserted to be seated in the circumferential trough portion as shown in Fig. 4.

[0044] In the embodiment shown the third securing portion 63 comprises a second bead 65 projecting from the outer portion 61. When the securing ring 55 is applied to the lid 5 as shown in Fig. 4 the second bead 65 rests in the depression 54 and thereby assists securing the securing ring 55 to the lid 5.

[0045] It should be understood that in the embodiment shown the securing ring 55 is accommodated within the outer lid wall portion 29 with a tight fit even though a small play is shown only for the sake of illustrating the different parts.

[0046] As in the embodiment shown the lid 5 comprises a circumferential trough portion 43 the lower portion 57 is accommodated within said trough portion 43 and in the embodiment shown the lower portion 57 fits around the inner trough wall 49 with a loose fit.

[0047] In the embodiment shown the securing ring 55 comprises an annular concave portion 67 situated at a lower inner side 69 of the upper flange portion 59, at which lower inner side 69 the upper flange portion 59 is integral with the lower portion 57. Opposite the lower inner side 69 the upper flange portion 59 has a free upper outer side 71.

[0048] The invention works as follows within this first embodiment described so far:

[0049] The container 1 is filled with an amount of a substance, e.g. a liquid such as paint or another chemical, and the lid 5 fitted onto the container body 3 in accordance with normal procedure to close the container. The securing ring 55 is applied to the lid 5 either before or after the lid 5 is applied to the container body 3.

[0050] If the filled container falls to the ground in an upside-down position whereby a force F of impact is applied at a circumferential point of impact 73 (Fig. 5) to the free upper outer side 71 of the upper flange portion 59

of the securing ring 55 the following happens:

[0051] The force F has a vertical component F_v and a horizontal component F_h . The vertical component F_v will tend to press the securing ring 55 downwards and by virtue of the engagement between the securing ring 55 and the trough bottom 51, either directly or through the adhesive 64, the lid will be pressed downwards at the circumferential point of impact 73 to enhance the securing of the seat of the lid 5 in the container body 3 at the circumferential point of impact. The horizontal component will tend to press, at the circumferential point of impact 73, the securing ring 55 towards the centre of the lid, see Fig. 5. Due to rigidity of the securing ring 55 the horizontal component F_h of the force F will be directed circumferentially through the securing ring 55 as indicated by arrows F_c and consequently the securing ring 55 will along its circumference, apart from at the circumferential point of impact 73 exert a radial outwards force F_r against the inner side 41 of the outer lid wall portion 29. This radial force F_r will further enhance the pressure of the lid-side securing portion 43 against the body-side securing portion 17 along the other portions of the circumference than at the circumferential point of impact thus providing enhanced securing of the lid 5 in its seat in the container body 3 along the circumference apart from the circumferential point of impact.

[0052] As a reaction to the impact the momentum of the liquid inside the container will result in an upwards force F_l on the inner side of the lid 5 tending to lift the lid 5 off the container body 3. However due to the effect of the securing ring 55 described above the lid 5 is able to withstand a force F_l substantially larger than hitherto possible.

[0053] To insure the full function of the securing ring 55 it should be kept in place during the impact. In case of a heavy impact the top edge of the container may be deformed, a part of the top edge including the circumferential trough portion 47 and the respective sealing surfaces 15 and 39 in the vicinity of the circumferential point of impact 73 being bent out of the general plane of the top 11 of the container. Further the upwards force F_l on the inner side of the lid 5 may dome the central portion 27 of the lid upwards, whereby the inner trough wall 49 will be pulled towards the centre of the container, especially at a bending point of the top edge, consequently pulling the trough bottom 51 and the lower part of the outer lid wall portion 29 towards the centre of the container. Both effects will result in forces tending to expel the securing ring 55 from its seat in the circumferential trough portion 47. The adhesive counteracts the forces tending to expel the securing ring 55 whereby it may be kept in its place to perform its function.

[0054] Apart from the above effect the upper flange portion will per se provide a cushioning effect that enhances the height from which the container may be dropped without leaking as a result of the impact.

[0055] The securing ring 55 should have a sufficient strength and rigidity to provide the effects and function

described above. Thus a suitable material for the securing ring 55 is polypropylene, but other materials providing a suitable rigidity and strength may be used. Using a material like polypropylene, which apart from having strength and rigidity also has some resilience and elasticity, the upper flange portion will provide a good cushioning effect.

[0056] Further though an acute angle α of approximately 45° is used in the embodiment shown different acute angles may be used e.g. up to 80° or 70° from the vertical. Normally the acute angle will be in the range of 35° to 55° from the vertical. However, in combination with the rigidity of the material, the geometry of the profile of the securing ring 55, including the acute angle α should be designed for the upper flange portion 59 to withstand collapsing when the container is dropped from a given maximum height of expected "survival" i.e. a maximum height from which the container is expected to be able to drop without leaking. Withstanding collapse the securing ring 55 will protect an upper rim part of the container body most effectively from direct impact. However even a smaller benefit of the invention may be obtained even in case of the upper flange portion collapsing since the upper flange portion still will absorb part of the energy of the impact.

[0057] Fig. 4 shows the profile of the securing ring 55 of the present example of an embodiment. The profile comprises a major annular recess 75, which provides for stacking filled containers as such containers would be stacked without the securing ring 55. Thus the annular recess 75 provides space for accommodating a circumferential joint at the bottom of a container stacked on top of the container shown.

[0058] As it appears from Fig. 4 the part of the lower portion 57 below the annular recess 75 has a substantial thickness compared to the parts above of the securing ring 55. To facilitate production of the securing ring 55 by injection moulding the securing ring 55 may be recessed e.g. as indicated in Figs. 4 and 6 by providing bores 77 in the part of the lower portion 57 below the annular recess 75 thus reducing the local wall thickness in said part. The bores 77 may as indicated in Fig. 4 be provided as through holes, as blind holes, or as a mixture thereof. Fig. 6 shows a small sector 79 provided with bores 77 but it should be understood that preferably such bores 77 are distributed evenly along the entire circumference of the securing ring 55.

[0059] When designing recesses for the securing ring 55, care should be taken not to weaken the securing ring to a degree that would ruin the function and effects described above. Thus in an embodiment the outer portion 63 is void of recesses to provide for the second bead 65 to extend continuously circumferentially along the inner surface 41 of the outer lid wall portion 29.

[0060] Due to the fact that the upper flange portion 57 extends at an acute angle α above the annular ledge 33 it is possible, even without removing the securing ring 55, to open the container 1 in the usual manner by in-

serting a screw driver-like tool 81 below the rim portion 33 of the lid 5 as indicated in Fig. 4 and lift the lid 5 from the container body 3 using the screw driver-like tool 81 as a lever. The insertion of a screw driver-like tool 81 may however be facilitated by recessing the upper flange portion, which thus may be interrupted in sectors of e.g. 2 cm along the periphery of the securing ring 55.

[0061] Fig. 7 shows an embodiment in which, compared to the embodiment shown in Fig. 4, the second bead 65 of a securing ring 55a is omitted. Thus Fig. 7 generally shows the same container as the preceding figures, but with a different variant of the securing ring. Accordingly similar features of the variants have been given similar reference numerals. By the variant of Fig. 7 an area 83 of the third securing portion 63 positioned immediately above the second bead 65 as seen in Fig. 4 will by its abutment against the inner surface 41 of the outer lid wall portion 29 provide for the effect of enhancing the pressure of the lid-side securing portion 43 against the body-side securing portion 17 as well as providing for enhancing the pressure of the lid-side sealing surface 39 against the body-side sealing surface 15.

[0062] In the variant of Fig. 7 recesses 85 in the supporting portion 57 are elongated in the circumferential direction and are open downwards. Hereby excess adhesive 64' may penetrate into the recesses 85 when the securing ring 55a is inserted into the circumferential trough portion 47 during manufacture or in case of an impact.

[0063] In the variant of Fig. 7 the securing ring 55a comprises an inner raised annular portion 87 provided for supporting similar containers stacked on top of the container shown. Usually the bottom of a container stacked on top is supported by a raised lid portion 89 adjacent the circumferential trough portion 47 a circumferential joint at the bottom of the container stacked on top being accommodated in the circumferential trough portion 47. At the variant of Fig. 7 the circumferential joint at the bottom of the container stacked on top will be accommodated in an annular recess 75a.

[0064] In order to provide a firm support for containers stacked on top the securing ring 55a this is at its bottom provided with circumferentially spaced knobs or protrusions 91 that penetrate the adhesive to make firm contact with the trough bottom 51.

[0065] While the securing rings 55 and 55a described so far may be manufactured by injection molding to be subsequently inserted in the circumferential trough portion Fig. 8 shows yet a different embodiment. In this embodiment a securing ring 55b has been provided by initially inserting a first string of hot-melt adhesive 64a that remains tacky when set and subsequently inserting a second string of hot-melt providing the securing ring 55b proper. The second string of hot-melt is e.g. EVA that sets to a firm non-tacky condition.

[0066] In the embodiment according to Fig. 8 the securing ring 55b lacks an upper flange portion and accordingly this embodiment lacks the cushioning effect of such

flange portion. However, this embodiment still provides for the effect of distributing a horizontal component F_h of the force of an impact against the joint 21 or rim portion 31 of the container, only in this case the force is distributed from the material of the container, eventually the outer lid wall portion 29 to the securing ring 55b.

[0067] It is noted that the centre of gravity of the materials of the first string of hot-melt adhesive 64a as well as the material of the second string of hotmelt are shifted towards the outer lid wall portion 29. This is obtained by spinning the lid 5 around its central vertical axis during insertion of the respective hot-melt strings.

Claims

1. A container (1) comprising a container body (3) and a lid (5),
said container body (3) having a bottom (9), a side wall (7) and an opening at a top (11) opposite the bottom (9),
said opening having a closing area with a body-side sealing surface (15),
said lid (5) having a central portion (27) and an outer lid wall portion (29), said outer lid wall portion (29) being circumferential and surrounding the central portion (27),
said outer lid wall portion (29) providing on an outer side (37) thereof a lid-side sealing surface (39),
said lid-side sealing surface (39) engaging with said body-side sealing surface (15), when the lid (5) is applied to the opening of the container body (3) to close the container (1),
the container (1) further comprising a securing ring (55) comprising a supporting portion (57) accommodated within the outer lid wall portion (29), **characterized in that** the securing ring is attached to the lid by an adhesive (64).
2. A container according to claim 1, **characterized in that** a body-side securing portion (17) diverging in a downwards direction is provided at the body-side sealing surface (15) and a lid-side securing portion (43) diverging in the downwards direction is provided at the lid-side sealing surface (39),
that said lid-side securing portion (43) engages with said body-side securing portion (17), when the lid (5) is applied to the opening of the container body (3) to close the container (1),
that said supporting portion (57) has an outer portion (61) comprising a third securing portion (63), and
that said third securing portion is arranged for engagement with an inner surface (41) of the outer lid wall portion (29), at least spotwise distributed, along the inner circumference of said inner surface.
3. A container according to claim 2, **characterized in that** said third securing portion (63) is arranged for engagement with said inner surface (41) of the outer lid wall portion (29) at a level of the lid-side securing portion (43) and/or immediately adjacent the level of the lid-side securing portion.
4. A container according to claim 2 or 3, **characterized in that** the inner surface of the outer lid wall portion has a downward diverging portion opposite the lid-side securing portion, and that the outer portion of the supporting portion comprises at least one bead projecting outwardly to be in engagement with the downward diverging portion of said inner side, preferably the third securing portion (63) comprises said at least one bead (65).
5. A container according to any one of claims 1 to 4, **characterized in that** the adhesive is elastic or viscoelastic in a set condition.
6. A container according to any one of the claims 1 to 5, **characterized in that** a rim portion (31) and an annular ledge (33) is provided at an upper end of said outer lid wall portion (29), and
the securing ring comprises an upper flange portion (59) extending from the supporting portion (57) above the annular ledge (33) at an acute angle (α) of less than 80° from vertical.
7. A container according to claim 6, **characterized in that** the upper flange portion (59) is conical upwardly diverging and has a lower inner side (69) connected integrally with the supporting portion (57) and a free upper outer side (71).
8. A container according to claim 6 or 7, **characterized in that** said acute angle (α) is less than 70° , preferably in the range 35° to 55° .
9. A container according to any one of the claims 1 to 8, **characterized in that** the supporting portion (57) of the securing ring fits within the outer lid wall portion (29) with a tight fit.
10. A container according to any one of the claims 1 to 9, **characterized in that** a circumferential trough portion (47) comprising an inner trough wall (49), a trough bottom (51) and said outer lid wall portion (29) is surrounding the central portion (27) of the lid (5) and **in that** the supporting portion (57) of the securing ring (55) fits around the inner trough wall (49) with a loose fit.
11. A container according to any one of the claims 1 to 10, **characterized in that** the securing ring (55) is recessed (77).
12. A container according to any one of claims 1 to 11, **characterized in that** the adhesive is a hot-melt ad-

hesive.

13. A container according to any one of the claims 1 to 5, **characterized in that** a circumferential trough portion (47) comprising an inner trough wall (49), a 5
trough bottom (51) and said outer lid wall portion (29) is surrounding the central portion (27) of the lid (5), and that the securing ring is cast in situ in the trough portion. 10
14. A container according to any one of claims 1 to 13, **characterized in that** the closing area is unilateral
15. A container according to any of the claims 1 to 14, **characterized in that** the securing ring is a permanent securing ring. 15

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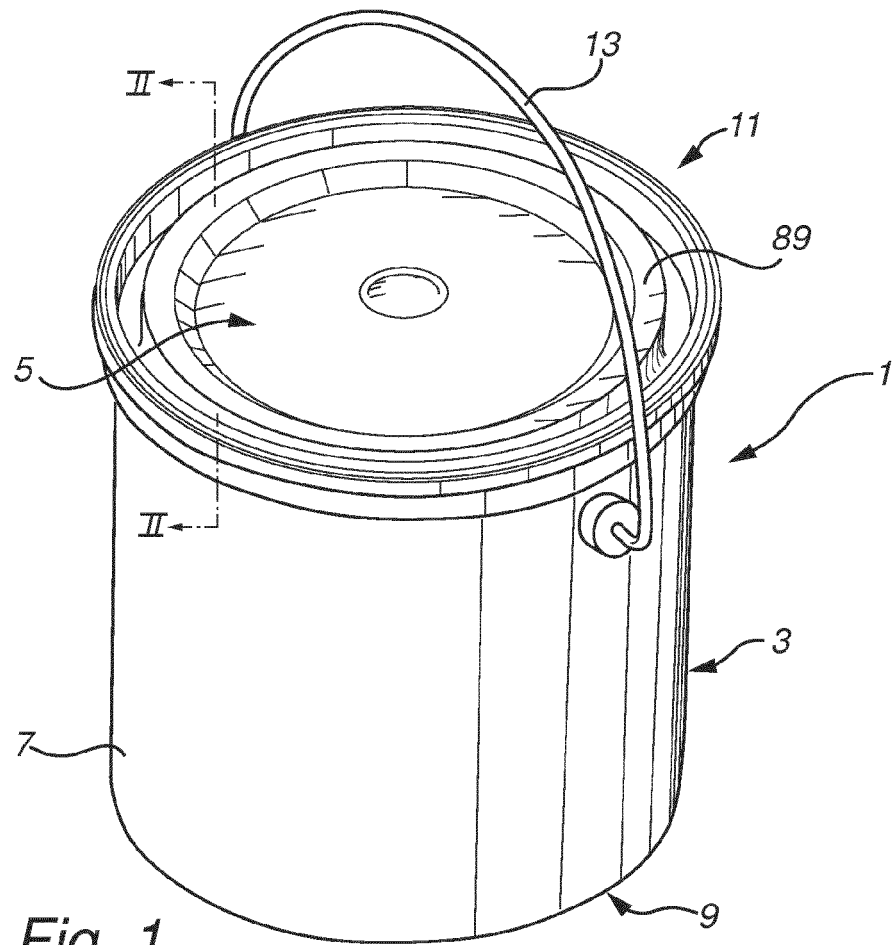


Fig. 1

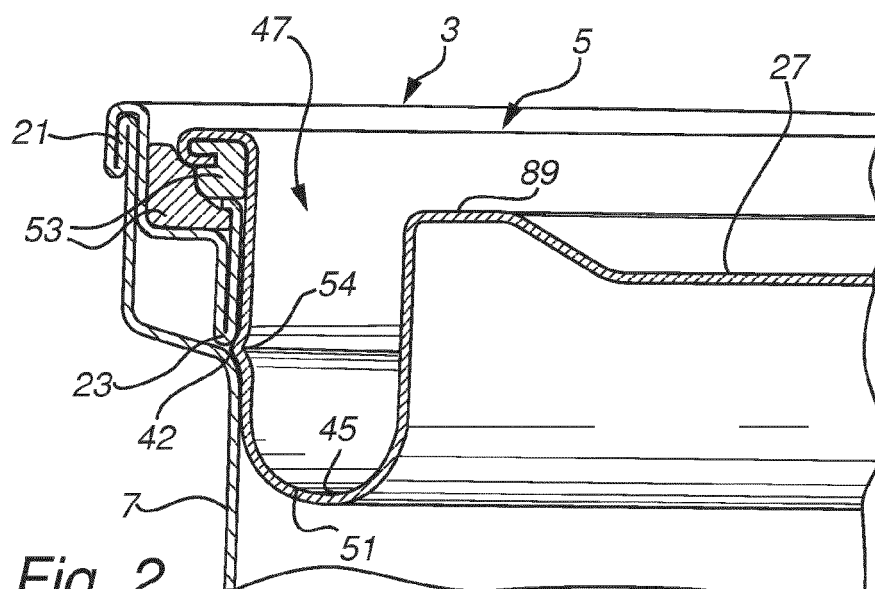
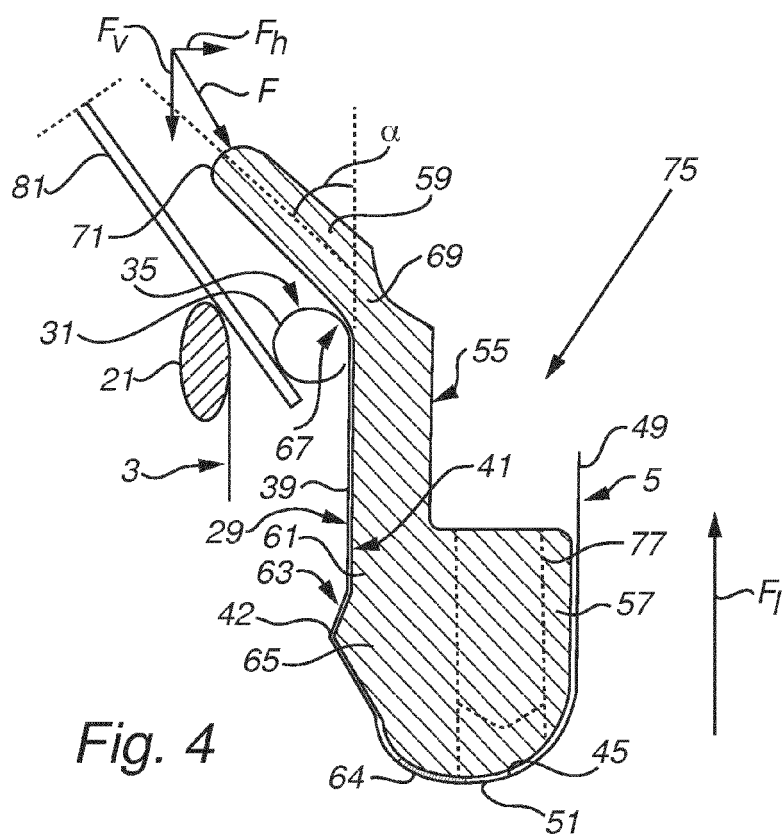
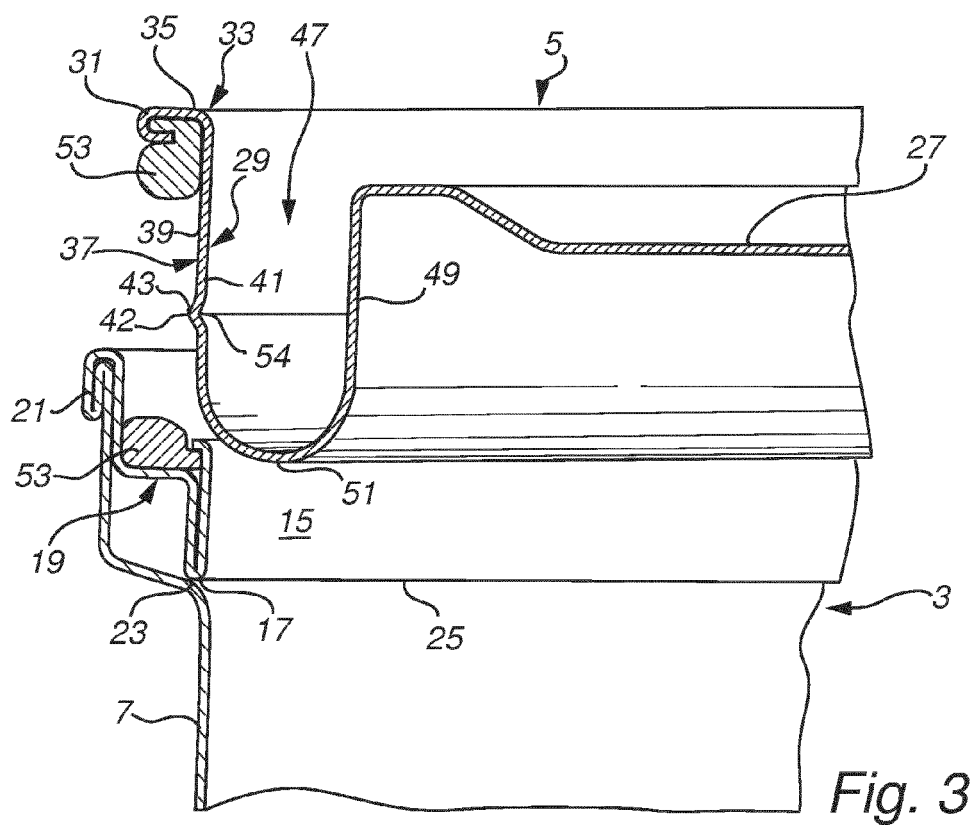
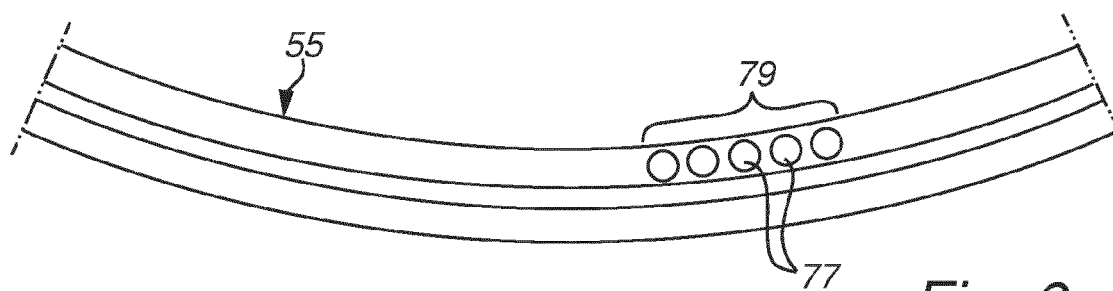
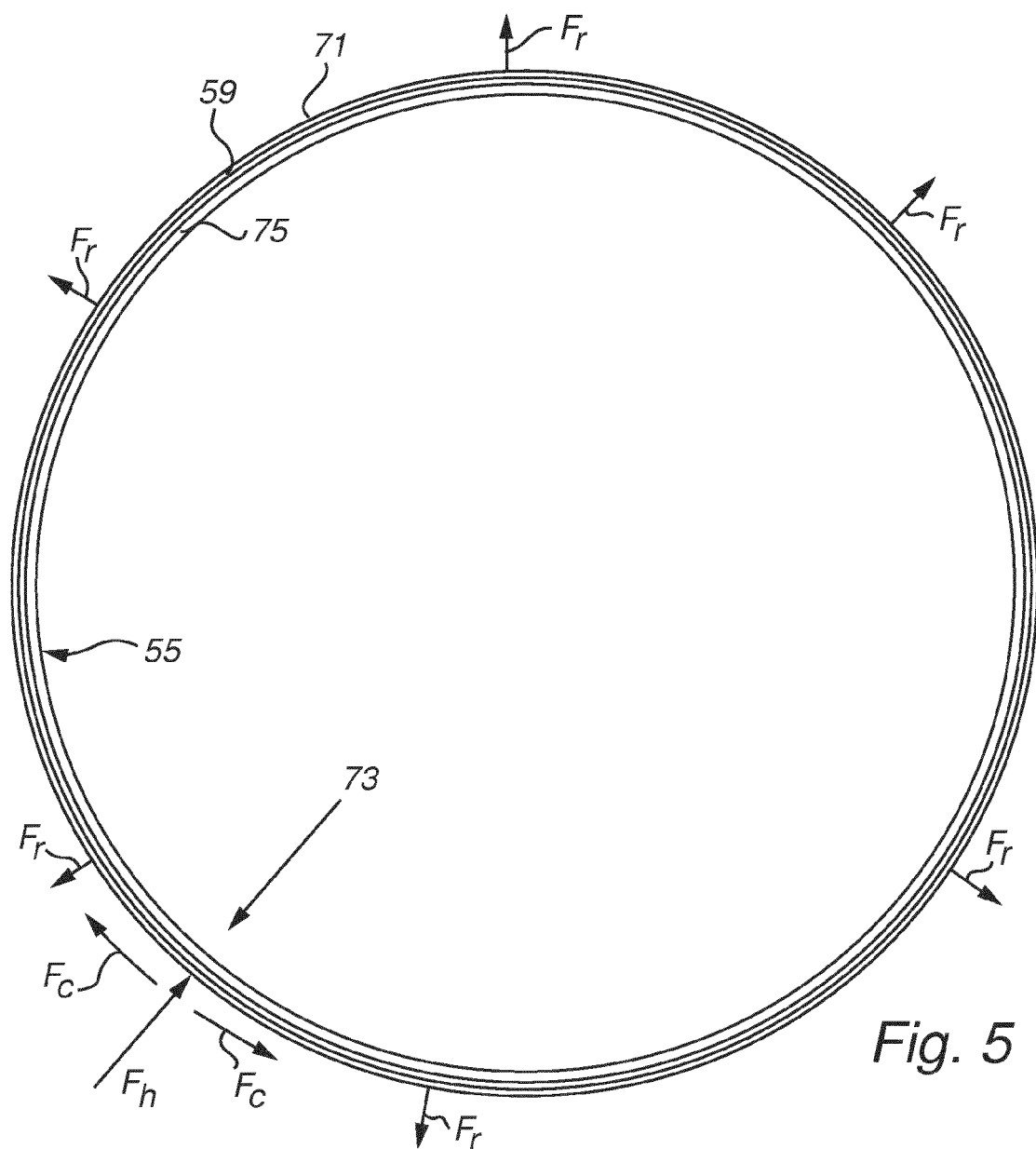


Fig. 2





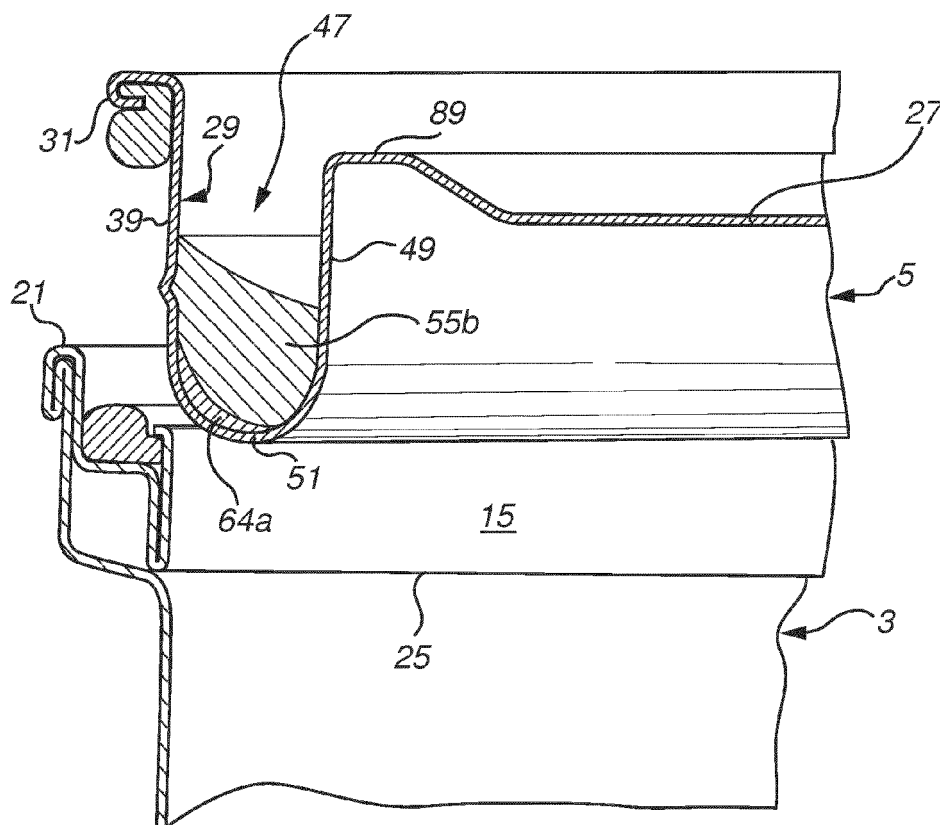


Fig. 8

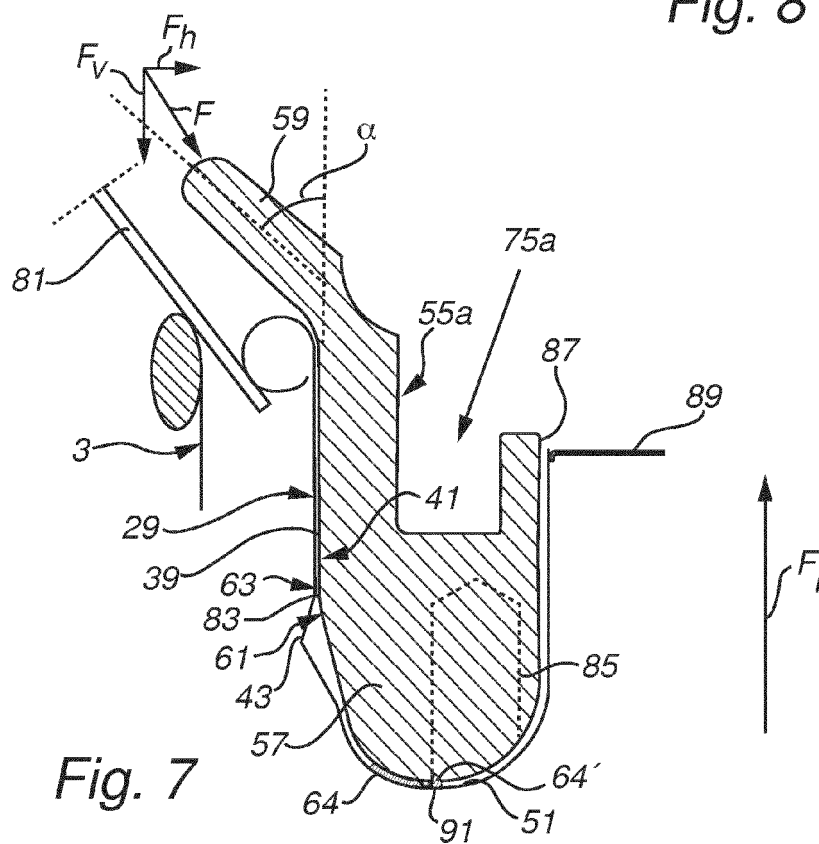


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
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			B65D
Place of search		Date of completion of the search	Examiner
The Hague		7 July 2015	Newell, Philip
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