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(54) **STACKABLE CONTAINER, CUP-SHAPED BODY AND LINER FOR SAID CONTAINER**

(57) Stackable container for liquids, in particular paints, having a cup-shaped body (2) and an internally covering liner (3); the cup-shaped body (2) having a first bottom wall (4) which closed at an end a first lateral wall (5) so as to delimit an inner cavity (14); wherein the first lateral wall (5) has a coupling band (7) and a truncated cone portion (8) forming a first bend (6); wherein said coupling band (7) forms with said truncated cone portion (8) and within the cup-shaped body (2) a first angle (α) greater than 180° ; wherein the liner (3) is realized in a single piece, covers the inner cavity (14) and is coupled against the cup-shaped bod (2), in particular against the coupling band (7).

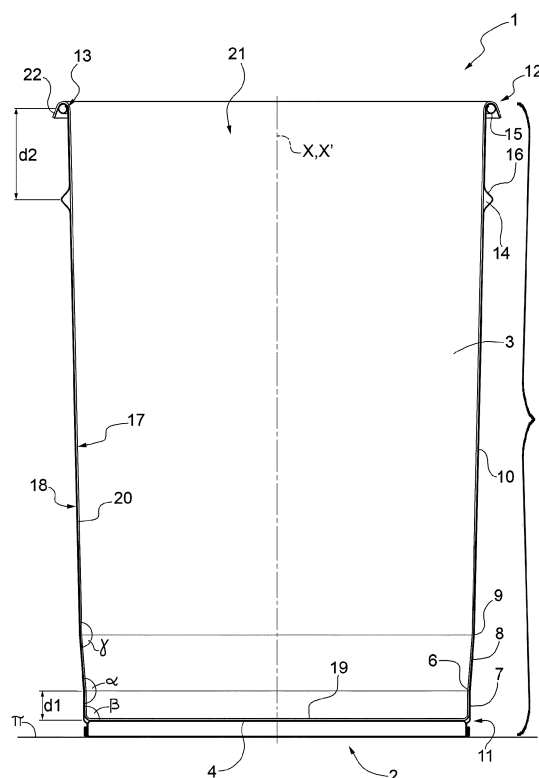


FIG.1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no 102018000011066 filed on 13/12/2018.

TECHNICAL FIELD

[0002] This patent application relates to a container, in particular a stackable container for liquid products, preferably paints, as well as to a cup-shaped body and a liner for said container.

BACKGROUND ART

[0003] A container is known, which is used to transport and store liquid products, for example paints, and comprises a cup-shaped body made of a metal material, in particular metal sheet. The container has a longitudinal symmetry axis and comprises a bottom wall as well as a lateral wall with a truncated cone or cylindrical shape, coaxial to the longitudinal axis. The bottom wall and the lateral wall delimit an inner cavity configured to house the liquid product.

[0004] The bottom wall and the lateral wall are treated on the inside depending on the type of liquid to be contained.

[0005] For example, the container is enamelled, a thermosetting powder is applied on the weld bead of the container and a paint is used to cover the welding spots of possible bosses for the handle. However, the processes used to enamel the container, apply the thermosetting powder and paint the welding spots of the bosses are long, expensive and very delicate. Alternatively, the container is internally covered with an inner liner, which is made of a plastic material and has a shape and sizes that are substantially complementary to the ones of the container.

[0006] For example, the inner liner is adopted in all those cases in which a barrier has to be created because of an incompatibility (with consequent corrosion problems) existing between the liquid product filling the container and the metal cup-shaped body.

[0007] Furthermore, the inner liner is adopted in all those cup-shaped bodies in which the use conditions of the liquid product filling the container have to be optimized (which means managing to entirely use all the product contained inside the container) and, at the same time, the final container disposal conditions have to be improved. In the containers of the type described above, indeed, after having removed the filling product, the inner liner can be taken out and be subjected to the respective recycling procedures, whereas the cup-shaped body made of a metal material is clean and can be reused or disposed of as metal scrap, without having to deal with further problems and bear further disposal costs.

[0008] For storage and transportation purposes, the containers described above are stacked without the liner. When forming the stack, the containers are inserted inside one another up to a given height, so as to penetrate one another and obtain a stack. By so doing, storage and transportation volumes can be reduced. In this case, a liner is applied, usually by hand, inside the container only when the container is removed from the stack.

[0009] In some cases, the containers are stacked with the inner liner already applied; however, known containers are affected by the following problems:

- the inner liner of a container slips out when the container inserted inside it is removed from the stack;
- in order to prevent the inner liners from being damaged and reduce the slipping-out phenomenon indicated above, the degree of interpenetration between the containers is reduced compared to containers without liner; therefore, given the same number of containers per stack, there is an increase in the storage and transportation space, with a consequent increase in logistics costs for this type of stacks.

[0010] The containers with liner already applied usually have a liner consisting of different parts welded together with weld beads. This leads to the risk of leaks through the weld beads.

[0011] Furthermore, the liner has, along the weld bead between the cylindrical body and the bottom, wrinkles and a non-uniform thickness, with the risk of porosity and leaks. In addition, weld beads are fragile and can break, for example if they are hit by the mixer during the mixing operations or if they are hit by a spatula usually used by operators to remove the liquid that sticks to the back once the entire product has been poured.

[0012] Furthermore, in the area of the weld beads, the overlapping edges, which are connected to one another, can generate cavities where possible additives added upon mixing can settle.

DISCLOSURE OF INVENTION

[0013] The object of the invention is to provide a container comprising a cup-shaped body and an inner protection liner, said container not suffering from the drawbacks of the prior art and, at the same time, being easy and economic to be manufactured.

[0014] A further object of the invention is to provide a cup-shaped body and an inner liner which allow for the creation of a container according to the invention.

[0015] According to the invention, there is provided a container according to the appended claims.

[0016] According to the invention, there is provided a cup-shaped body according to the appended claims.

[0017] According to the invention, there is provided a liner according to the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The invention will now be described with reference to the accompanying drawings, which show non-limiting embodiments thereof, wherein:

- Figure 1 is a longitudinal section of a container according to the invention;
- Figure 2 is a longitudinal section of two containers according to the invention stacked inside one another;
- Figure 3 is an enlarged detail of Figure 1;
- Figures 4 and 5 are similar to Figure 3 and show respective variants of the enlarged detail of Figure 3; and
- Figures 6 and 7 are schematic views of possible variants of a detail of the invention;
- Figure 8A is a view from the bottom of a variant of a detail according to the invention;
- Figure 8B shows, on a larger scale, a detail of Figure 8A;
- Figure 9 is a section view, on a larger scale, of a detail of two containers according to the invention stacked inside one another;
- Figure 10 is a perspective view of a variant of a plurality of containers according to the invention stacked inside one another;
- Figure 11 is a plan view of a detail of Figure 10;
- Figure 12 shows, on a larger scale, a detail of Figure 11;
- Figure 13 is similar to Figure 1 and shows a variant of a container according to the present invention;
- Figure 14 shows, on a larger scale, a detail of Figure 13;
- Figure 15 is a perspective view of a variant of the container shown in Figure 13.

BEST MODE FOR CARRYING OUT THE INVENTION

[0019] In Figure 1, number 1 indicates, as a whole, a container, in particular for liquids, preferably paints. The container 1 comprises a cup-shaped body 2 and a liner 3. The liner 3 is manufactured as one single piece and is inserted inside the cup-shaped body 2, as described more in detail below, so as to obtain a continuous and smooth inner cover.

[0020] The terms high/low, upper/lower or the likes are used with reference to the normal arrangement of a container on a support plane n.

[0021] According to Figure 1, the cup-shaped body 2 is made of a metal material, in particular metal sheet. The cup-shaped body 2 has a longitudinal axis X and comprises a bottom wall 4 and a lateral wall 5. The lateral wall 5 is axial-symmetric.

[0022] The lateral wall 5 advantageously has a bend 6, which is determined by a variation in the inclination of the metal sheet and separates a tubular portion, hereinafter referred to as coupling band 7, from a truncated cone

portion 8.

[0023] According to the example shown in Figure 1, the coupling band 7 is adjacent to the bottom wall 4 and the truncated cone portion 8 has a conical shape with a progressive reduction of the diameter towards the bottom wall 4. The bend 6 substantially is the area joining the coupling band 7 and the truncated cone portion 8.

[0024] According to the example shown in Figure 1, the coupling band 7 is cylindrical; however, it can have different shapes, without because of this loosing in generality, for example it can be tapered or have a polygonal section.

[0025] The lateral wall 5 advantageously has a further bend 9. In particular, the lateral wall 5 has a further truncated cone portion 10. Hereinafter, the truncated cone portions will be identified as lower truncated cone portion 8 and upper truncated cone portion 10.

[0026] The upper truncated cone portion 10 has a conical shape with a progressive reduction of the diameter towards the bottom wall 4. The bend 9 is the area joining the lower truncated cone portion 8 and the upper truncated cone portion 10.

[0027] According to the variants shown in Figures 6 and 7, the cup-shaped body can have different configurations.

[0028] According to Figure 6, the cup-shaped body can only have an upper truncated cone portion 8'. According to Figure 7, the coupling band 7 can be interposed between two truncated cone portions 8" and 10".

[0029] According to Figure 1, the lower truncated cone portion 8 is interposed between the upper truncated cone portion 10 and the coupling band 7.

[0030] The coupling band 7 and the lower truncated cone portion 8 advantageously form an angle $\alpha > 180^\circ$, so as to have, close to the bend 6, a non-linear variation of the inner section of the cup-shaped body 2.

[0031] The coupling band 7 preferably forms, inside the cup-shaped body 2, an angle β with the bottom wall 4. According to the example shown in the Figures, the cylindrical wall 7 is substantially perpendicular to the bottom wall 4; in other words, the angle β is of 90° . According to variants which are not shown herein, the cylindrical wall 7 can be also inclined towards the inside of the cup-shaped body 2; in other words, the angle β can be within the following range $85^\circ \leq \beta \leq 95^\circ$.

[0032] Thanks to the presence of the bend 6, the adherence between the liner 3 and the cup-shaped body 2 increases, as explained more in detail below.

[0033] In the area of the bend 9, the upper truncated cone portion 10 advantageously forms, inside the cup-shaped body 2, an angle $\gamma < 180^\circ$. Close to the bend 9 there is a non-linear variation of the inner section of the cup-shaped body 2.

[0034] Thanks to the presence of the bend 9, the adherence between the liner 3 and the cup-shaped body 2 increases, as explained more in detail below.

[0035] Furthermore, the upper truncated cone portion 10 and, if present, the lower truncated cone portion 8

allow different containers 1 to be stacked on top of one another, so as to optimize transportation and storage volumes and, as a consequence, costs. Without losing in generality, according to variants which are not shown herein, the profile of the lateral wall 5 can have a different shape, for example it can be polygonal, provided that there still are the bend 6 and/or the bend 9.

[0036] According to the Figures, the bottom wall 4 closes the lateral wall 5 in the area of a lower end 11. Furthermore, the cup-shaped body 2 has, in the area of an upper end 12, a product outlet opening 13.

[0037] The bottom wall 4 and the lateral wall 5 delimit an inner cavity 14. The opening 13 establishes a communication between the inner cavity 8 and the outside. Preferably, the cup-shaped body 2 is generally known as conical container, which means that the size of the opening 13 coincides with the upper section of the cup-shaped body 2.

[0038] The lateral wall 5 has an edge 15 delimiting the opening 13. The lateral wall 5 advantageously has a circular rim 16, which is coaxial to the longitudinal axis X and projects outwards relative to the rest of the lateral wall 5. The rim 16 is manufactured in a known manner through expansion of the upper truncated cone portion 10. The rim 16 acts as an abutment for stacking the containers 2 on top of one another.

[0039] Furthermore, the lateral wall 5 has an inner surface 17, which faces the cavity 14, and an outer surface 18, which is substantially parallel to and opposite the inner surface 17.

[0040] The cup-shaped body 2 further has a crimped edge 30, which joins the bottom wall 4 and the lateral wall 5 to one another. The crimped edge 30 has a substantially tubular outer edge 31.

[0041] According to Figures 3 to 4, the lateral wall 5 advantageously has a tapered portion 32 in the area of the bottom wall 4, so that the diameter d3 of the outer edge 31 is smaller than the outer diameter 4d of the lateral wall 5.

[0042] The liner 3 is advantageously manufactured as one single piece. The liner 3 is preferably made of a plastic material, in particular polypropylene or polyethylene. The liner 3 is manufactured through thermoforming.

[0043] The liner 3 has a cup-shaped body with a longitudinal axis X' and comprises a bottom wall 19 and a lateral wall 20. The lateral wall 20 is axial-symmetric and the bottom wall 19 closes it in the area of an end, so as to delimit, with the lateral wall 20 itself, a housing 21.

[0044] According to the example shown in the Figures, the lateral wall 20 has a substantially cylindrical or truncated cone shape. According to a variant which is not shown herein, the lateral wall 20 can have a polygonal profile.

[0045] The liner 3 has a shape and sizes that are similar to the ones of the inner cavity 14 of the cup-shaped body 2. The liner 3 is flexible. In particular, the use of a plastic material (such as polypropylene or polyethylene) and the reduced thickness, for example below 2 mm, advantageously

allows below 1 mm, allow the liner 3 to be coupled to the shape and geometry of the cup-shaped body 2.

[0046] The liner 3 can further comprise a border 22 bent towards the outside of the cup-shaped body 2 and partially around the edge 15.

[0047] The extension d1 along the longitudinal axis X of the coupling band 7 is advantageously smaller than, at the most equal to, the distance d2 between the rim 16 and the edge 15. In this way, when two containers 1 are stacked on top of one another, the coupling band 7 of the outer container remains free.

[0048] Figure 2 shows two containers 1I and 1II stacked on top of one another and the suffixes I and II indicate the elements of the lower container and of the upper container, respectively. The container III rests with its rim 1611 on the edge 151 and on the border 221 of the liner 31.

[0049] When the cup-shaped body 211 of the container III is inserted inside the container 1I, the coupling band 711 and the crimped edge 3011 are not in contact with the container 1I. The fact that the diameter d3 is smaller than the diameter d4, as mentioned above, improves this aspect.

[0050] This prevents the inner liner 3I from slipping out when the container III is removed from the stack, as explained more in detail below.

[0051] In use, in order to manufacture the container 1, a cup-shaped body 2 and a liner 3 of the type described above are provided.

[0052] This can take place either by picking up the cup-shaped body 2 and the liner 3 from a store or by directly manufacturing them.

[0053] Then, the liner 3 is inserted into the cavity 8 of the cup-shaped body 2 so as to place the bottom wall 19 of the liner 3 in contact with the bottom wall 4 of the cup-shaped body 2. Similarly, the lateral wall 20 of the liner 3 is caused to adhere to the lateral wall 5 of the cup-shaped body 2.

[0054] The lateral wall 20 advantageously has an extension along the longitudinal axis X which is greater than the one of the lateral wall 5, so that there is a complete covering of the lateral wall 5 and, if necessary, an at least partial covering around the edge 15.

[0055] The liner 3 is advantageously pushed, in the area of the bottom wall 19, against the bottom wall 4 of the cup-shaped body 2, so as to eliminate possible air bubbles present at the bottom of the container 1 between the liner 3 and the cup-shaped body 2.

[0056] Furthermore, the lateral wall 20 is pushed against the lateral wall 5 of the cup-shaped body 2, in particular in the area of the coupling band 7.

[0057] In other words, when the cup-shaped body 2 and the liner 3 are assembled, it is advantageously possible to eliminate air bubbles present between the liner 3 and the cup-shaped body 2, in particular in the area of the bottom wall 4 and of the coupling band 7.

[0058] In this way, a depression is created in the area of the bottom of the container 1, thus allowing the liner 3

to adhere to the cup-shaped body 2.

[0059] In the area of the bend 6 there advantageously is a corresponding bend of the liner 3, thus creating a sort of joint/step between the liner 3 and the cup-shaped body 2.

[0060] In a situation like the one shown in Figure 2, in case of different containers 1I and 1II stacked on top of one another (the example only shows, for the sake of simplicity, two containers, but it is possible to build stacks with many containers), advantageously, the joint obtained with the bend 6I in cooperation with the surface adhesion of the liner 3I on the entire coupling band 7I allows for an adhesion between the cup-shaped body 2I and the liner 3I which is such as to prevent the liner 3I from slipping out of the cup-shaped body 2I when the container 1II inserted on the inside is removed.

[0061] Indeed, thanks to the presence of the bend between the coupling band 7 and a further truncated cone portion, a "diameter-to-diameter" coupling is obtained between the liner 3 and the cup-shaped body 2 in the area of the coupling band 7. In other words, the expression "diameter-to-diameter" coupling indicates an interference coupling. The "diameter-to-diameter" coupling between the liner 3 and the cup-shaped body 2 along the coupling band 7 advantageously prevents air from flowing in, in particular along the coupling band 7, thus preventing the liner 3 from slipping out of the cup-shaped body 2 by applying a separation force, between the cup-shaped body 2 and the liner 3, which is comparable to or exceeds to one generally developed when a container 1 is removed from a stack.

[0062] Furthermore, if a separation force is applied along the axis X between the liner 3 and the cup-shaped body 2, in the area of the diameter-to-diameter coupling along the coupling band 7 there is a friction force between the surface of the liner 3 and the surface of the cup-shaped body 2, which counters, resisting it, the slipping-out action.

[0063] Moreover, the fact that the distance d1, namely the extension of the coupling band 7, is smaller than the distance d2, namely the distance between the rim 16 and the edge 15, allows the container 1II stacked inside the container 1I not to come into contact with the coupling band 7I and with the lower truncated cone wall 8I, if present. In this way, possible interferences between the container 1II and the liner 3I close to the coupling band 7I and the lower truncated cone wall 8I, if present, are avoided. In other words, the container 1II is prevented from moving the liner 3I relative to the cup-shaped body 2I.

[0064] Owing to the above, the container 1 comprises a liner 3 which perfectly adheres, in particular in the area of the coupling band 7, to the inner surface 17 of the lateral wall 5. Furthermore, the liner 3 does not have protuberances, as it is manufactured as one single piece, which is why it does not have joints.

[0065] Moreover, advantageously, the fact of substantially completely eliminating the air (namely, any fluid)

between the liner 3 and the cup-shaped body 2 in the area of the coupling band 7, in addition to the joint between the cup-shaped body 2 and the liner 3 in the area of the bend 6, ensures a perfect adhesion between them.

Therefore, the liner 3 perfectly adheres to the cup-shaped body 2 in the area of the coupling band 7 without the risk of possible separations.

[0066] Furthermore, the presence of the further bend 9 between the upper truncated cone portion 10 and the lower truncated cone portion 8 creates a further joint between the cup-shaped body 2 and the liner 3. Indeed, thanks to the presence of the bends 9 and 6, the liner 3 rests against the surface of the lower truncated cone portion 8. In addition, the lower truncated cone portion 8 allows for a greater reduction of the section of the cup-shaped body 2 close to the bottom compared to known truncated cone containers. Therefore, thanks to this greater reduction of the section, there is a greater shrinking of the cup-shaped body 2 on the liner 3 compared to known containers. This greater shrinking increases the adherence of the liner 3 on the inner surface 17 of the cup-shaped body 2.

[0067] Owing to the above, the container 1 of the type described above has a sort of vacuum between the liner 3 and the cup-shaped body 2 in the area of the coupling band 7, said vacuum generating a superficial adhesion of the liner 3 on the coupling band 7, which counters the separation of the liner 3 from the cup-shaped body 2. This force is sufficient to counter the slipping out of the liner 3 and ensure that the liner 3 remains adherent to the cup-shaped body 2 even when the containers 1 are removed from a stack.

[0068] Owing to the above, the container 1 is easy and economic to be manufactured and can be manufactured automatically. The liner 3 is manufactured as one single piece and, since it has no joints or edges that, in use, project inside the housing 17, it ensures a continuous and uniform covering of the cup-shaped body 2.

[0069] The adhesion between the cup-shaped body 2 and the liner 3 is as great as possible and, therefore, the risk of the liner 3 slipping out, even in case of stacking, is completely eliminated.

[0070] Furthermore, advantageously, since the adherence between the liner 3 and the cup-shaped body 2 is improved and such as to avoid an accidental slipping out, it is possible to stack more containers 1 compared to known containers. This means that the distance d2 of the rim 16 from the edge 15 can be reduced and, hence, a greater number of containers 1 can be stacked. This evidently reduces, in a significant manner, storage and transportation costs.

[0071] The distance d2 can advantageously be smaller than 85 mm, advantageously smaller than 65 mm.

[0072] In Figures 4 and 5, numbers 101 and 201 indicate respective variants of the container 1. The components shared with the container 1 maintain, in Figures 4 and 5, the same numbers and are considered as included in the description even if they are not mentioned again

for the sake of brevity.

[0073] The container 101 has, along the coupling band 7, an annular protrusion 130, which protrudes towards the outside of the cup-shaped body 2.

[0074] The container 201 has, along the coupling band 7, an annular protrusion 230, which protrudes towards the inside of the cup-shaped body 2.

[0075] In addition to the advantages described above for the container 1, the containers 101 and 201 have the further advantage that the presence of the protrusions 130 and 230, respectively, increases the joining and, as a consequence, the adhesion between the liner 3 and the cup-shaped body 2.

[0076] In Figures 8A and 8B, number 301 indicates a further variant of the container 1. The components shared with the container 1 maintain, in Figure 9, the same numbers and are considered as included in the description even if they are not mentioned again for the sake of brevity.

[0077] The cup-shaped body 2 of the container 301 advantageously has one or more recesses 35, namely bends, obtained on the crimped edge 30 and oriented towards the inside of the crimped edge 30. According to Figure 9, the recesses 35 form respective discontinuities, namely ports, along the crimped edge 30 and, in case of different containers 301 stacked on top of one another (the container 301II being inserted inside the container 301I), allow for an easier air flow between the two containers 301I and 301II. In particular, the recesses 35 allow for an easier air flow along the outer surface 1811 of the container 301II towards the inside of the container 301I, in particular towards the inside of the inner volume 211 of the liner 31, when the container 301II is stacked and removed.

[0078] In Figures 10 to 12, number 401 indicates a further variant of the container 1. The components shared with the container 1 maintain, in Figures 10 to 12, the same numbers and are considered as included in the description even if they are not mentioned again for the sake of brevity. The container 401 advantageously has one or more discontinuities 45, namely recesses or protrusions, along the rim 16 and towards the inside of the rim 16. This allows for the formation of an airgap, namely a port, for the passage of air in the area of the rim 16. The discontinuities 45 advantageously allow, in case of different containers 401 stacked on top of one another, the container 401II being inserted inside the container 401I, for an easier air flow between the two containers 401I and 401II. In particular, the discontinuities 45 allow for an easier air flow along the outer surface 18 of the container 401II towards the inside of the container 401I, in particular towards the inside of the inner volume 21 of the liner 31, when the container 401II is removed.

[0079] Figures 13 and 14 illustrate a further variant of container 1. The components shared with the container 1 maintain, in Figures 13 and 14, the same numbers and are considered as included in the description even if they are not mentioned again for the sake of brevity.

[0080] According to the variant shown in Figures 13 and 14, border 22 is shaped to adhere to edge 15 and to form a recess 23, namely an interfering element with edge 15. Recess 23 is substantially a fold connecting two portions 24 and 25 of the border 22 itself. Advantageously, the recess 23 is disposed, in use, below the edge 15, namely is interposed between the edge 15 and the bottom wall 19. According to Figures 13 and 14, recess 23 is circumferential, namely realize a close line around edge 15. According to the variant illustrated in Figure 15, the border 22 can have one or more recesses 23, each of which interferes with a respective portion of the edge 15, as will be illustrated in the following. According to another not illustrated variant, the border 22 can have a plurality of circumferential recesses 23 distributed along the longitudinal axis X, in this case the presence of a plurality of recesses 23 advantageously guarantees the interference (with a second recess 23 less close to the edge 15) between the liner 3 and the cup-shaped body 2 if, in use, the recess 23 more close to the edge 15 is deformed so as not to interfere anymore with the edge 15.

[0081] The recess 23 is distant, in use, from the outer surface 18 of the cup-shaped body 2 to form an annular window 26 with an opening 27 having a width, i.e. the extension radial to the longitudinal axis X of the cup-shaped body 2, minor than the width of the edge 15. In this way, to take off the edge 15 from the liner 3 it is necessary to deform/stretch at least partially the border 22.

[0082] According to Figures 13 and 14, portion 24 is interposed between the lateral wall 20 and portion 25. The portion 24 overlaps laterally the edge 15. Advantageously, the recess 23 is made by means of plastic deformation of the liner 3.

[0083] Advantageously, the presence of the recess 23 make it possible to maintain the liner adherent to the cup-shaped body 2 and to avoid to take off the liner 3 to the cup-shaped body 2.

[0084] According to the variant shown in Figures 13 and 14, advantageously, the border 22 of the liner 3, if present, is tightened around the edge 15 to adhere to it. The border 22 can be already deformed and having the recess 23, in this case, the edge 15 is inserted beneath the portion 24 to be tightened within the border 22.

[0085] According to a further variant, the liner 3 is made of a thermoplastic material, therefore, in use, the border 22 is deformed around the edge 15b to form the recess 23. In this way, the recess 23 is configured not to be deformed during use at room temperature and to maintain its predefined shape.

[0086] Advantageously, the presence of the recess 23 permit to keep the liner 3 adherent to the cup-shaped body 2 and avoid, during use, the take-off of the liner 3 itself.

[0087] In Figure 15 it is illustrated a further variant of the container 1 shown in Figures 13 and 14. The components shared with the container 1 maintain, in Figure 15, the same numbers and are considered as included

in the description even if they are not mentioned again for the sake of brevity.

[0088] According to the variant shown in Figure 15, the container 1 can have one or more recesses 23 separated one another, namely the recesses 23 do not realize a close line. Without losing generality, the number of recesses 23 can be different. The recesses 23 can be disposed differently to the shown solution. According to a not illustrated variant, the recesses 23 can be two or more. In case of a plurality of recesses 23, the recesses themselves can be diametrically opposed one another and/or uniformly distributed about the longitudinal axis X.

[0089] According to another variant, not shown, the liner 3 comprises as interfering elements one or more coupling means. Each interfering element is configured to be put in contact/to couple, in use, with the edge 15 of the cup-shaped body 2. For example, the interfering element can be a protrusion / a part projecting, in use, from the border 22 towards the cup-shaped body 2.

[0090] According to a variant which is not shown herein, a container can be a combination of the solutions disclosed above. For example, a container can have: one or more recesses 35 along the crimped edge 30 and/or one or more discontinuities 45 along the rim 16 and/or one or more protrusions 130, 230 along the coupling band 7 and/or the recess 23 of the liner 3 below the edge 15.

Claims

1. A stackable container for liquids, in particular paints, comprising a cup-shaped body (2) and a liner (3), which internally covers said cup-shaped body (2); wherein the cup-shaped body (2) is made of metallic material, in particular metal sheet, has a longitudinal axis (X) and comprises a first bottom wall (4) and a first lateral wall (5); wherein the first bottom wall (4) closes at an end the first lateral wall (5) so as to delimit an inner cavity (14); wherein the cup-shaped body (2) has a opening (13), which puts the inner cavity (14) in communication with the outside; the first lateral wall (5) having an edge (15), which delimits said opening (13); wherein the first lateral wall (5) has a coupling band (7) and a truncated cone portion (8) forming a first bend (6); wherein said coupling band (7) forms with said truncated cone portion (8) and within the cup-shaped body (2) a first angle (α) greater than 180° ; wherein the liner (3) is made of plastic material, in particular polypropylene or polyethylene; wherein the liner (3) is realized in a single piece, in particular has been realized by means of thermoforming; wherein the liner (3) comprises a second bottom wall (19) and a second lateral wall (20); the second bottom wall (19) closing at an end the second lateral wall (20), so as to delimit a housing (21) for liquid products; wherein the liner (3) is flattened against the cup-shaped body (2), in particular against the coupling band (7), so as to substan-

tially avoid the presence of fluids, in particular air, between the liner (3) and the cup-shaped body (2).

2. A container according to Claim 1, wherein the coupling band (7) of the cup-shaped body (2) is cylindrical and substantially perpendicular to said first bottom wall (4) .
3. A container according to Claim 2, wherein the coupling band (7) of the cup-shaped body (2) has one or more protrusions (130; 230) which protrude radially towards the inside or towards the outside of the cup-shaped body (2) .
4. A container according to any of the preceding claims, wherein the lateral wall (5) of the cup-shaped body (2) has a further truncated cone portion (10) which forms with said truncated cone portion (8) a second bend (9); wherein said truncated cone portion (10) forms with the further truncated cone portion (10) a second angle (γ) smaller than 180° .
5. A container according to any of the preceding claims, wherein the first lateral wall (5) of the cup-shaped body (2) has a rim (16) which protrudes radially outside from the first lateral wall (5) and permits to stack the container (1; 101; 201; 301; 401) itself on a further container; wherein the extension (d1) along the longitudinal axis (X) of the coupling band (7) is smaller than the distance (d2) between the rim (16) and the edge (15) .
6. A container according to Claim 5, wherein said distance (d2) is smaller than 85 mm, preferably smaller than 65 mm.
7. A container according to any of the preceding claims, wherein the cup-shaped body (2) has a crimped edge (30), which connects the bottom wall (4) with the lateral wall (5); wherein the diameter (d3) of the crimped edge (30) is smaller than the diameter (d4) of the lateral wall (5) .
8. A container according to any of the preceding claims, wherein in correspondence of said coupling band (7) there is a diameter-to-diameter coupling, namely through interference, between the cup-shaped body (2) and the liner (3) .
9. A container according to any of the preceding claims, wherein said liner (3) comprises interfering elements (23) configured to realize an interference between the liner (3) and the cup-shaped body (2).
10. A container according to any of the preceding claims, wherein the liner (3) comprises a border (22) bent towards the outside of said cup-shaped body (2); wherein said border (22) is shaped to form a recess

(23) as interfering elements, which laterally delimits an opening (26) with said first lateral wall (5) of the cup-shaped body (2); wherein said opening (26) has a width, namely the radial extension to the longitudinal axis (X) of the cup-shaped body (2), minor than the width of the edge (15).

11. A container according to claim 10, wherein said recess (23) is a fold connecting a first portion (24) with a second portion (25) of said border (22); wherein said first portion (24) is interposed between said recess (23) and said second lateral wall (20); said first portion (24) surrounding at least partially said edge (15).

12. A cup-shaped body for a stackable container (1; 101; 201; 301; 401) for fluids, in particular paints, having a longitudinal axis (X) and comprising a bottom wall (4) and a lateral wall (5); wherein the bottom wall (4) closes at an end the lateral wall (5), so as to delimit an inner cavity (14); wherein the cup-shaped body (2) has an opening (13) which puts in communication said inner cavity (14) with the outside; the lateral wall (5) having an edge (15), which delimits said opening (13); wherein the lateral wall (5) has a coupling band (7) and a truncated cone portion (8) forming a first bend (6); wherein the coupling band (7) forms with said truncated cone portion (8) and within the cup-shaped body (2) a first angle (α) greater than 180° .

13. A cup-shaped body according to Claim 12, wherein the lateral wall (5) has a further truncated cone portion (10), which forms with said truncated cone portion (8) a second bend (9); wherein said truncated cone portion (8) forms with the further truncated cone portion (10) a second angle (γ) smaller than 180° .

14. A cup-shaped body according to Claim 12 or 13, wherein the first lateral wall (5) has a rim (16), which radially protrudes outside said first lateral wall (5) and permits to stack the container (1; 101; 201; 301; 401) itself on a further container (1; 101; 201); wherein the extension (d1) along the longitudinal axis (X) of the coupling band (7) is smaller than the distance (d2) between the rim (16) and the edge (15); in particular said distance (d2) is smaller than 85 mm, preferably smaller than 65 mm.

15. A cup-shaped body according to Claim 14, wherein the rim (16) of the cup-shaped body (2) has a discontinuity (45), namely a recess or a protrusion, which permits the constitution of an airgap for the passage, in use, of air when the containers (401) are stacked.

16. A cup-shaped body according to any of the Claims from 12 to 15, wherein the cup-shaped body (2) has a crimped edge (30), which connects the bottom wall

(4) with the lateral wall (5); wherein the cup-shaped body (2) has one or more or recesses (35), namely bends, realized on the crimped edge (30) and towards the inside of the crimped edge (30) itself, so as to constitute an airgap for the passage, in use, of air when the containers (2) are stacked.

17. A liner for a container (1; 101; 201; 301; 401) for fluids, in particular paints, the liner (3) being made of plastic material, in particular polypropylene or polyethylene; wherein the liner (3) is made in a single piece, in particular has been realized by means of thermoforming.

18. A liner according to claim 17 and comprising a lateral wall (20) and a border (22) bent towards the outside of said lateral wall (20); wherein said border (22) has interfering elements configured to realize an interference between the liner (3) and the cup shaped body (2); in particular, said border (22) is shaped to form a recess (23), namely a connecting fold, between a first portion (24) and a second portion (25) of said border (22); wherein said first portion (24) is interposed between said recess (23) and said lateral wall (20); said first portion (24) being configured to surround, in use, at least partially said edge (15); said recess (23) being configured to tighten at least partially said edge (15) inside said first portion (24).

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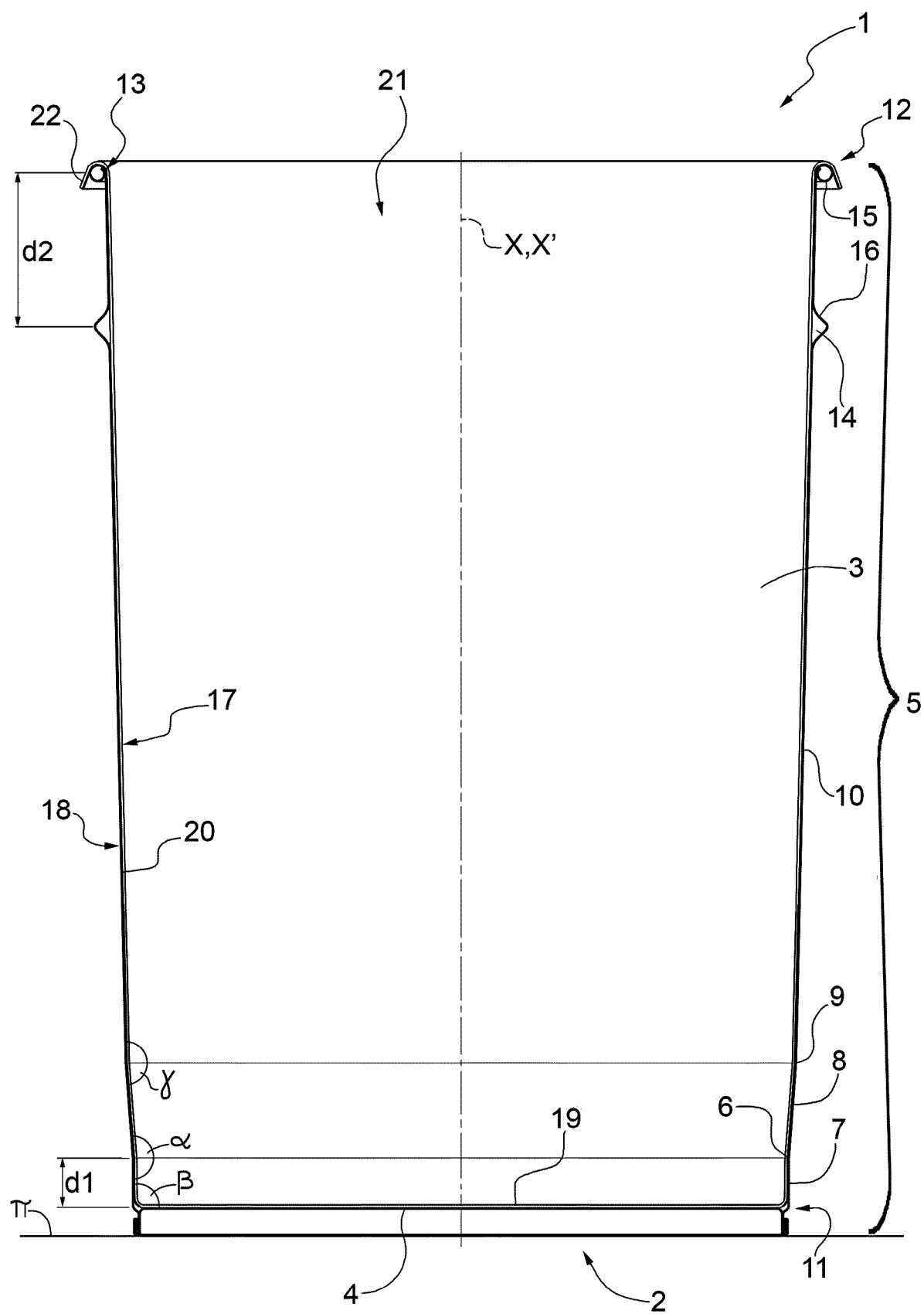


FIG.1

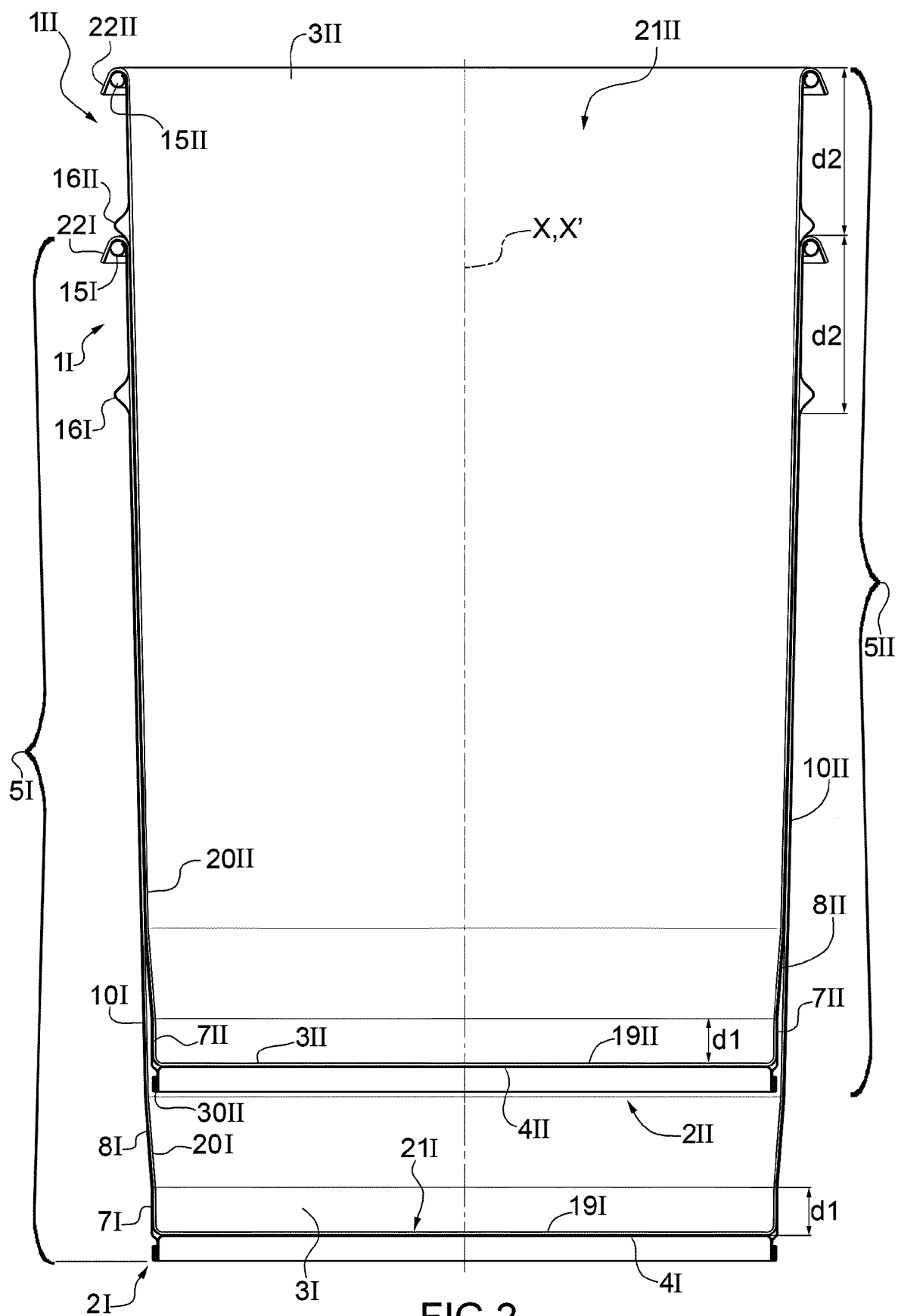
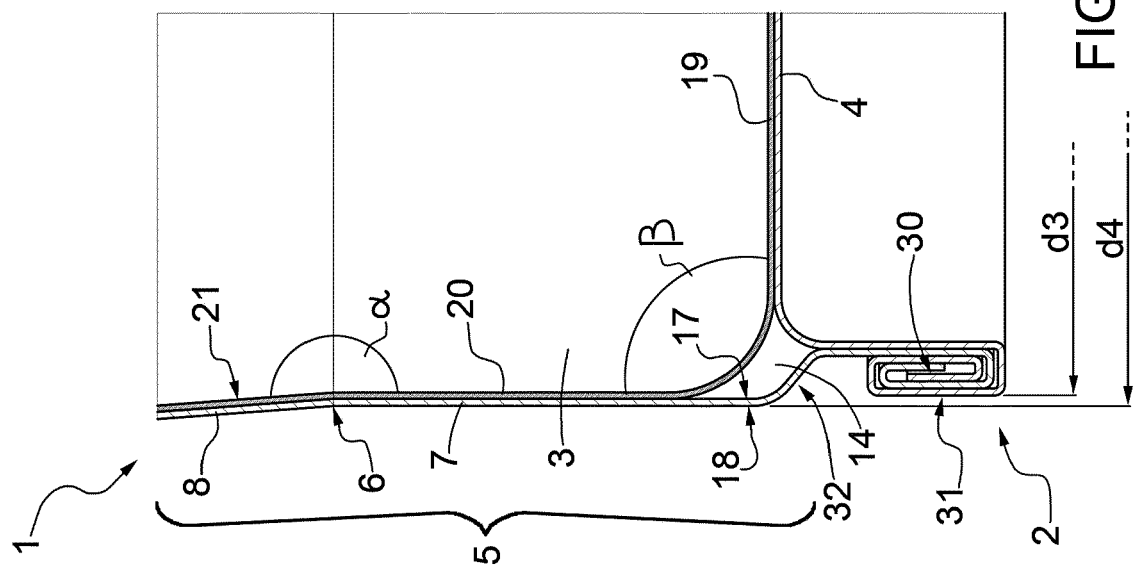
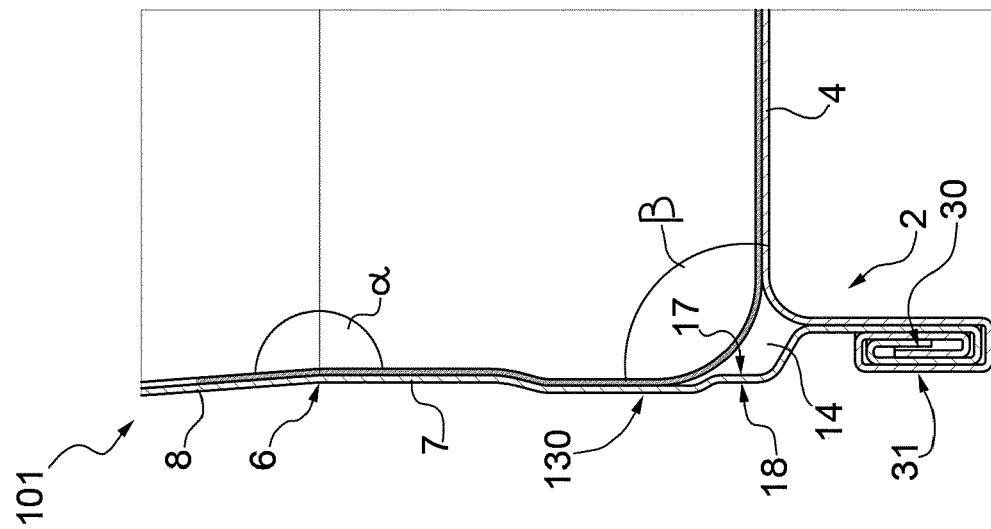
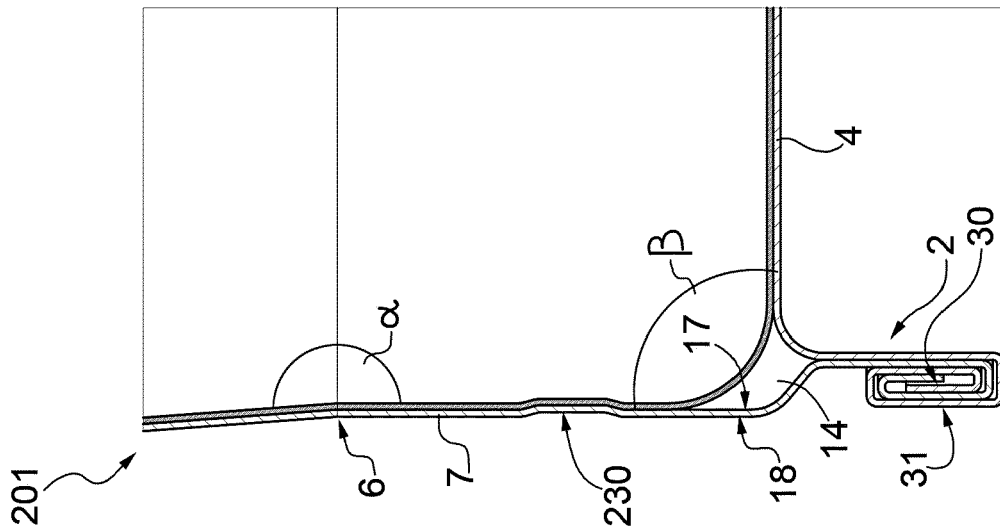
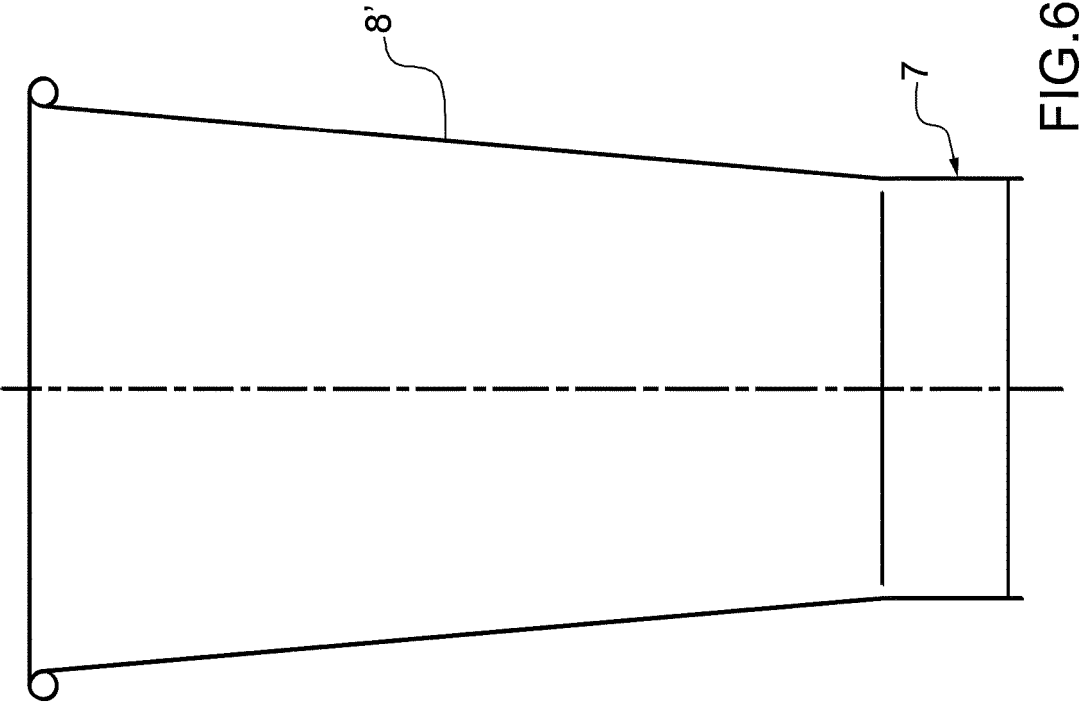
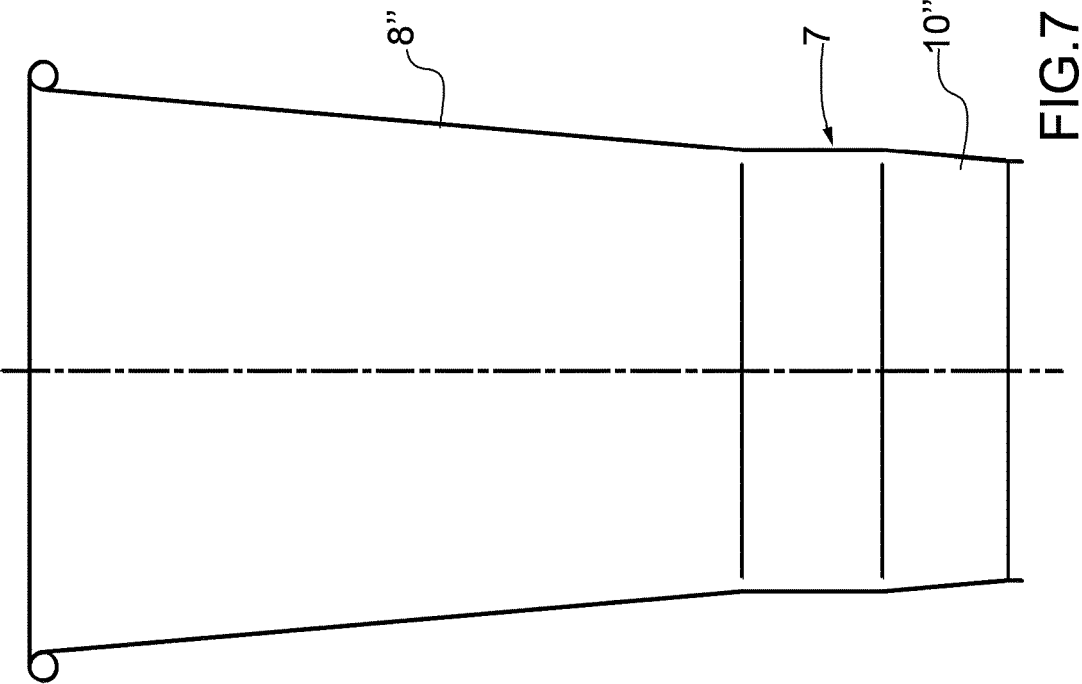


FIG.2





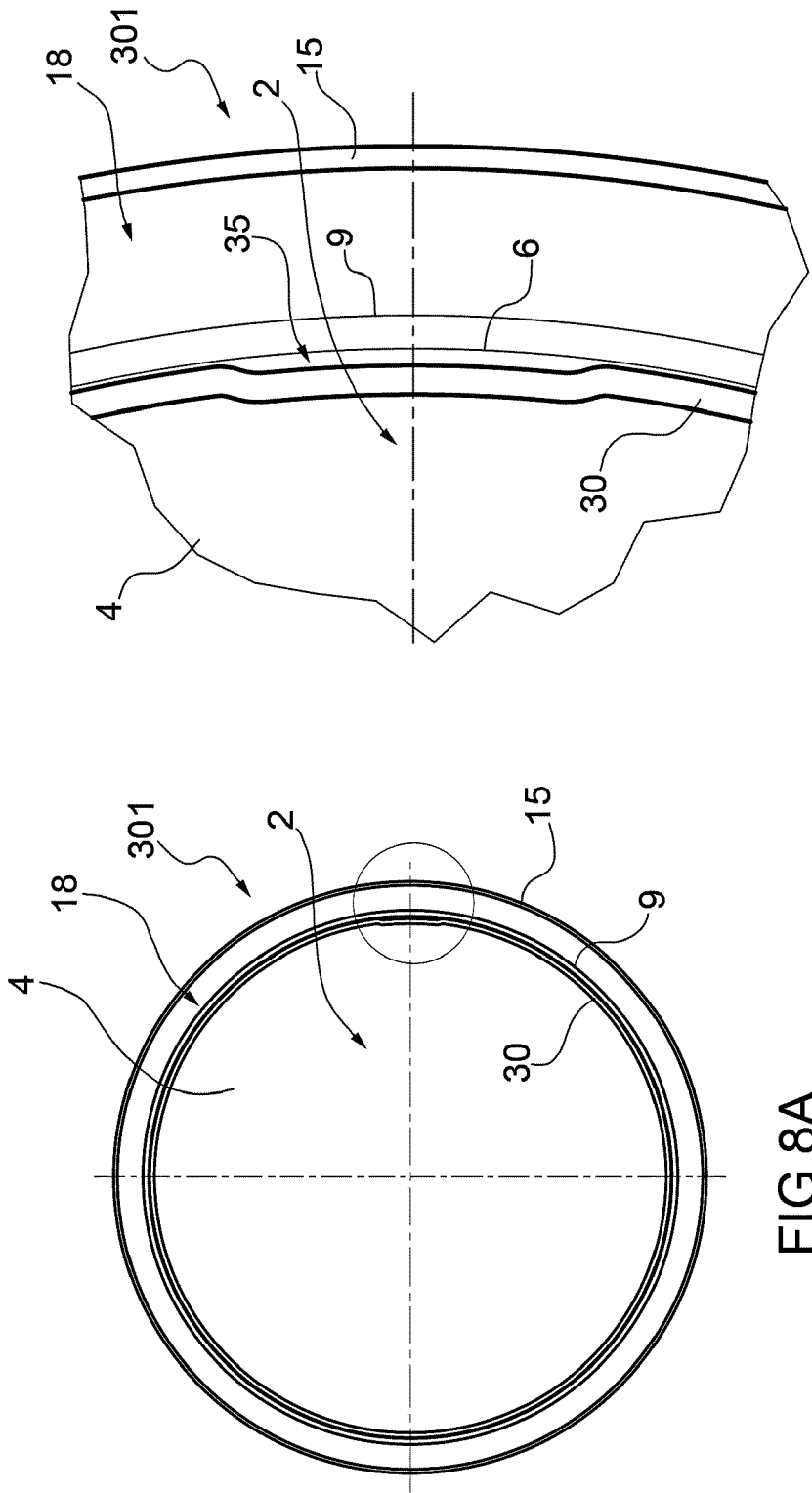


FIG.8B

FIG.8A

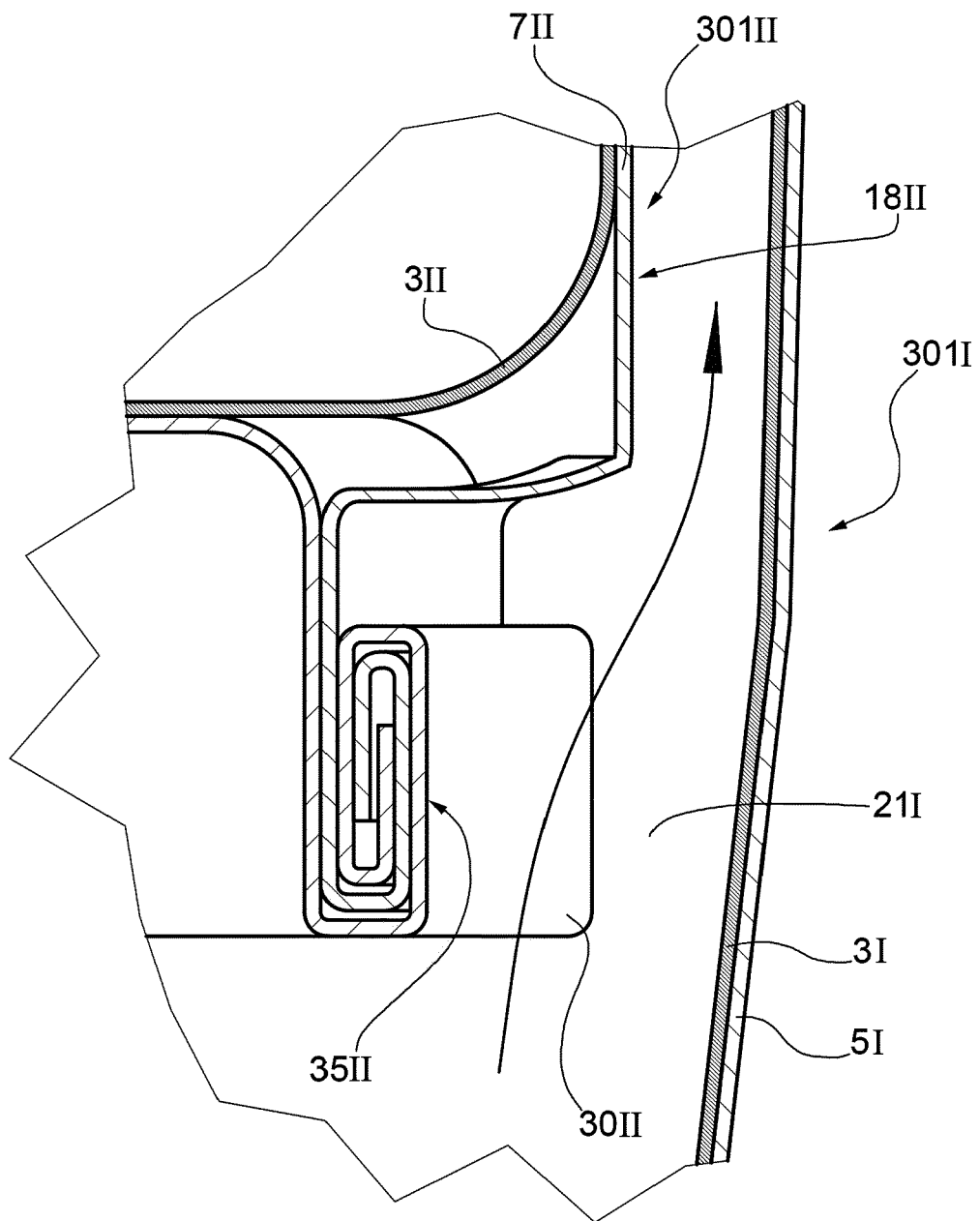


FIG.9

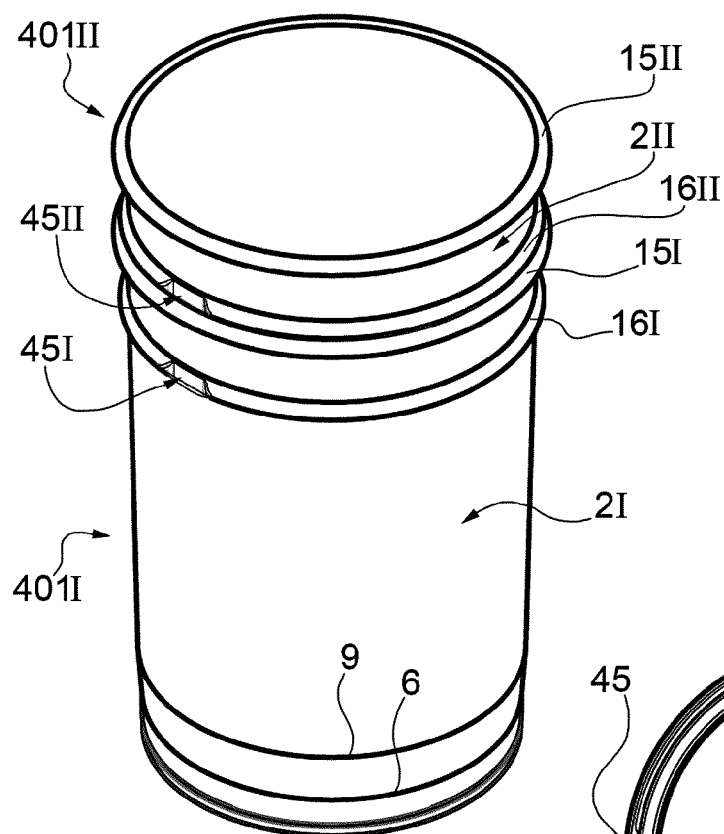


FIG. 10

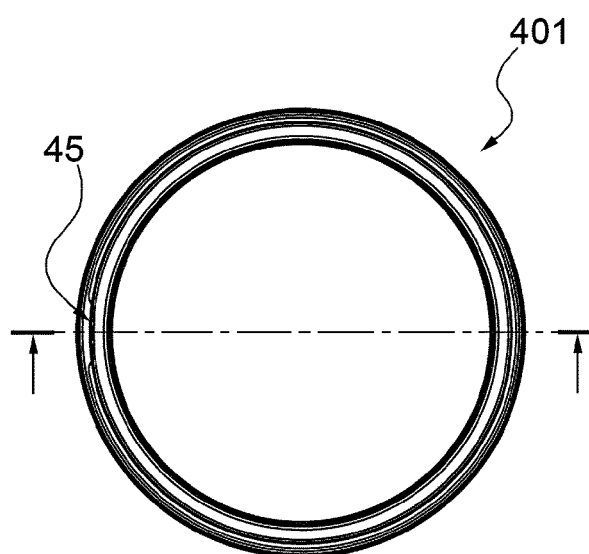


FIG. 11

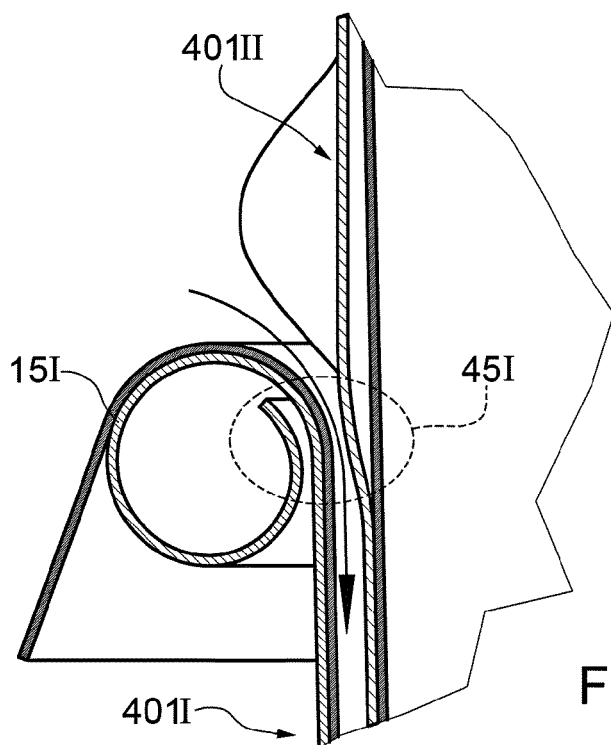


FIG. 12

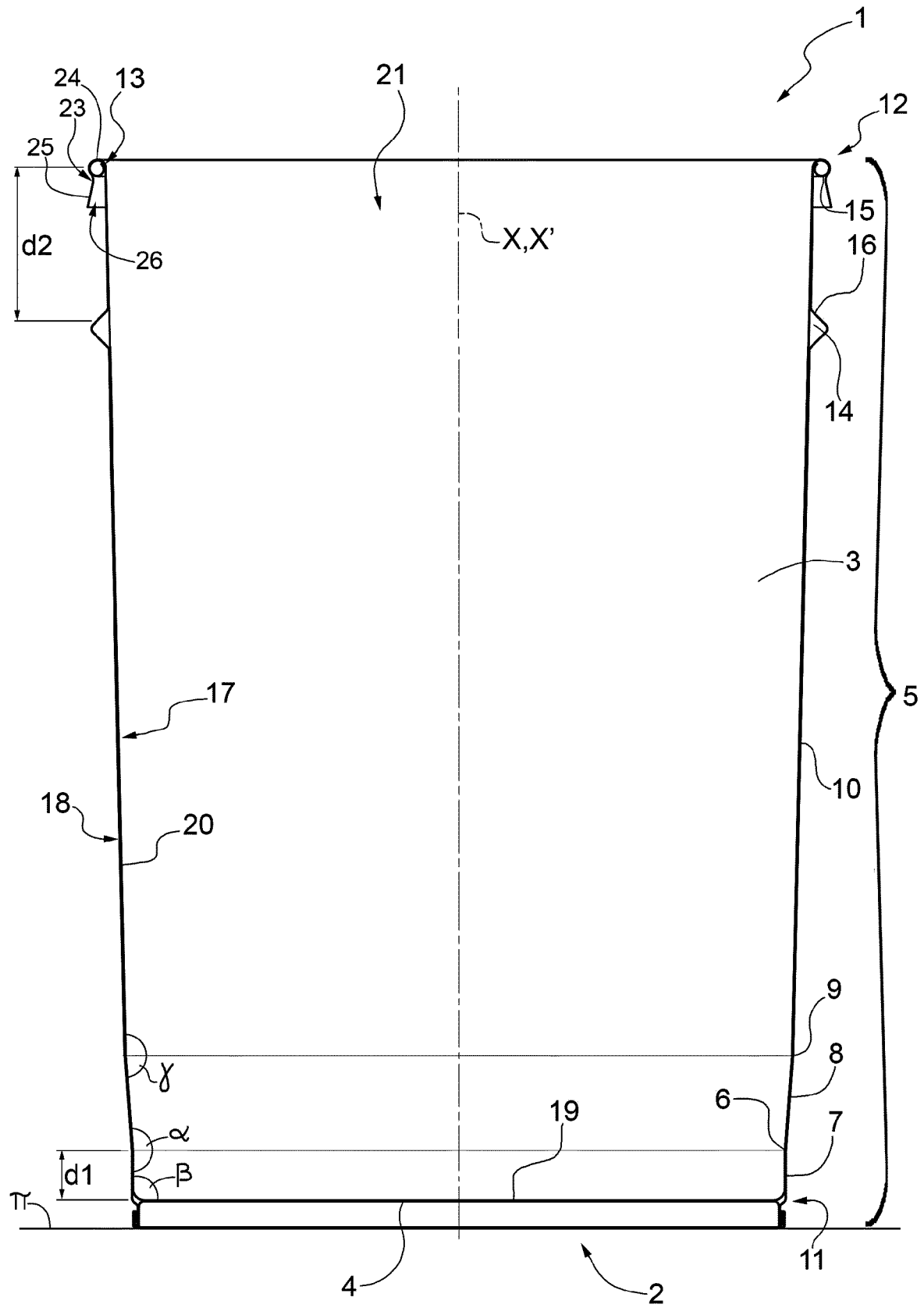


FIG.13

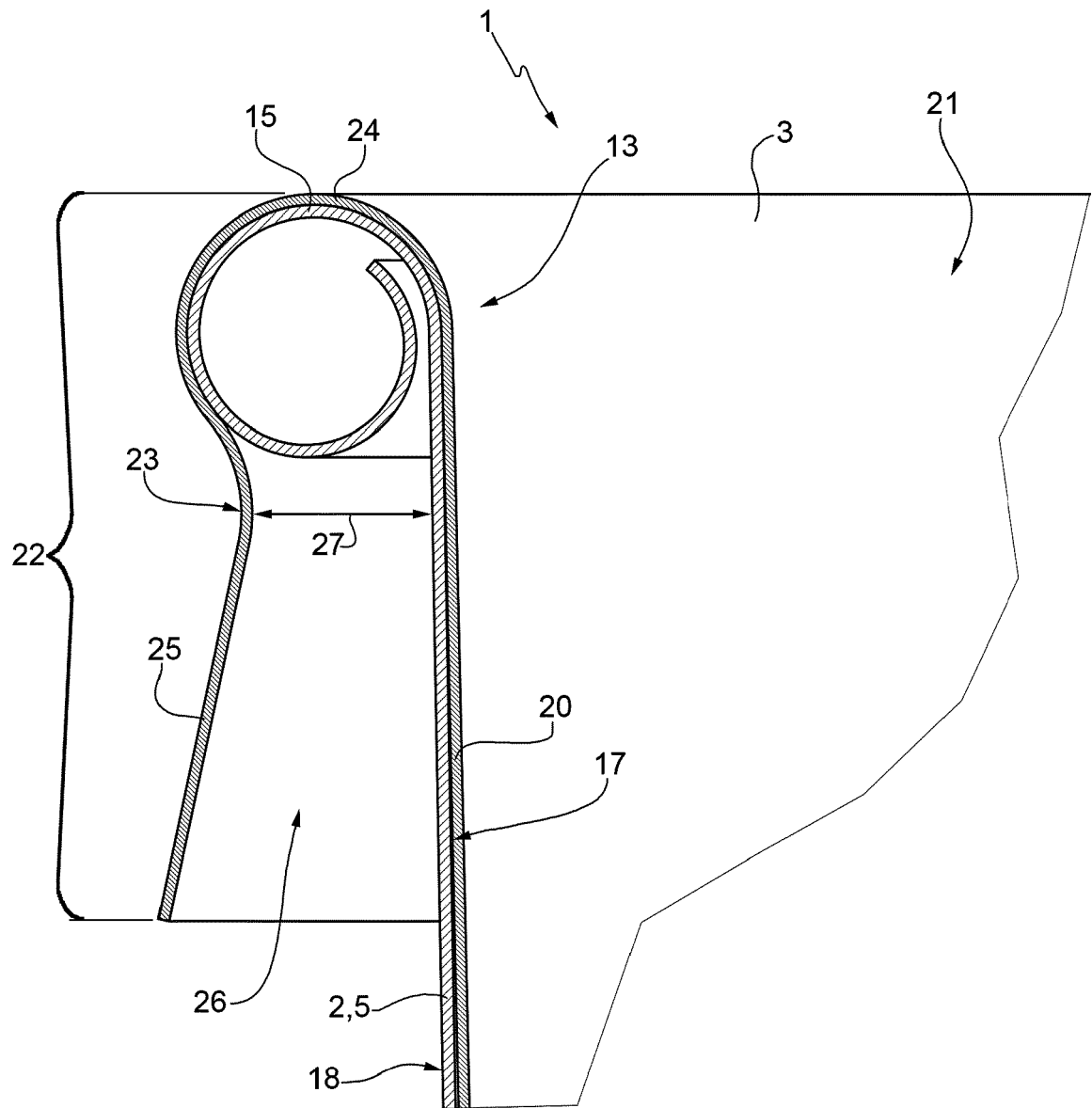


FIG.14

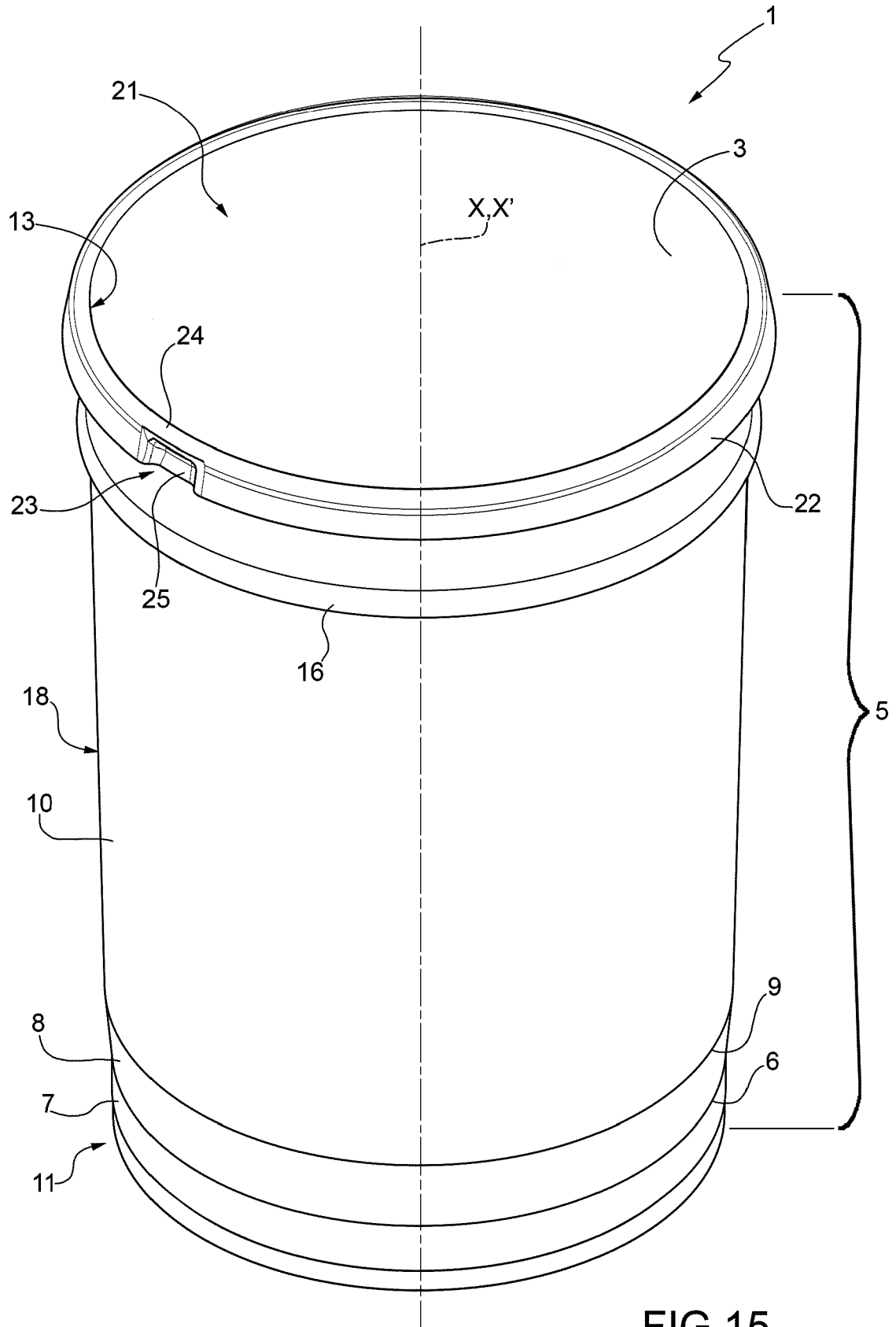


FIG.15



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Application Number
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Y	* Figures 5, 7 and related text in the description. *	1,2, 4-11,14	

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	* Figure 3 and related text. *		

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	* Figs. 1, 3 and related text. *		

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 April 2020	Examiner Pernice, Ciro
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