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(54) **Container with an improved cap**

(57) A container (2) fitted with a cap (1). The cap (1) has a component (3) having an annular cavity (10) defined by a first wall (3a) and a second wall (3b). And the first and second wall (3a) (3b) each have a respective annular shoulder (14) (16) on which an edge (13; 13*; 13**) of a fastening collar (15; 15*; 15**) and an annular shoulder (15c) of the fastening collar (15; 15*; 15**) rest respectively.

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Description

[0001] The present invention relates to a container with an improved cap.

[0002] As is known, metal containers, for paint for example, always have a metal lid.

[0003] An outlet, closed by a cap, is formed in the lid.

[0004] The cap may be either a screw-on type or a plug forced into the outlet in the lid.

[0005] Obviously, in the case of a screw cap, the outlet must have a threaded collar on which to screw the cap.

[0006] Known caps are not very safe, and are subject to leakage of the material from the container, particularly when the cap is put back on for the first time.

[0007] Moreover, in industry, the container is filled and the cap screwed on by means of automatic machines which, to screw the cap on, comprise a cap pickup device; and a device for first placing the cap onto the outlet in the container lid, and then rotating the cap with respect to the container to screw it on. The complexity and cost of an automatic machine designed to perform the above operations are obvious. What is more, the machine must first ensure the cap and the outlet in the container lid are perfectly aligned, so they can be connected properly, and then ensure sufficient torque to screw the cap on correctly but without damaging the container. This is particularly so, for example, in the case of containers made of deformable material, such as certain types of metal containers. Moreover, for certain products, such as paint or foodstuffs, current regulations call for perfect fluidtight sealing; and the complexity of the automatic machine referred to above is obviously further compounded when the outlet in the container lid is formed along other than the vertical longitudinal axis of the container.

[0008] It is therefore an object of the present invention to provide a container with an improved cap designed to eliminate the aforementioned drawbacks.

[0009] A number of preferred embodiments of the present invention will be described with reference to the accompanying drawings, in which:

Figure 1 shows a partial view in perspective of a container featuring a cap in accordance with the teachings of the present invention;

Figure 2 shows a larger-scale section of a first embodiment of the Figure 1 cap fitted to a fastening collar;

Figure 3 shows a larger-scale section of a second embodiment of the Figure 1 cap fitted to a fastening collar;

Figure 4 shows a larger-scale section of a third embodiment of the Figure 1 cap fitted to a fastening collar;

Figure 5 shows a first embodiment of a fastening collar of the cap in Figures 1, 2, 3, 4;

Figure 6 shows a second embodiment of a fastening collar of the cap in Figures 1, 2, 3, 4;

Figure 7 shows a third embodiment of a fastening collar of the cap in Figures 1, 2, 3, 4;

[0010] Numeral 1 in Figures 1 and 2 indicates as a whole a cap for an outlet BC in a lid CP of a container 2 made of metal, plastic, or any other material.

[0011] Cap 1 is defined by a first component 3 made of plastic material; and by a substantially capsule-shaped second component 4 also made of plastic material.

[0012] Second component 4 comprises, in known manner, a substantially flat, circular main body 5.

[0013] An inner first edge 6 and an outer second edge 7 project, substantially parallel to each other, from circular main body 5.

[0014] Each of the two edges 6 and 7 is in the form of an annular body.

[0015] Whereas both the cylindrical surfaces 6a, 6b of edge 6 are completely smooth, edge 7 has an inner cylindrical surface 7a with helical projections 8, and a smooth outer cylindrical surface 7b. In actual fact, grooves or knurling (not shown) are formed along the generating lines of outer cylindrical surface 7b to improve grip to screw and unscrew the cap.

[0016] As shown in Figure 2, first component 3 comprises, on its outer wall 3a, a number of helical projections 9 which, in use, form a screw connection with projections 8 of second component 4.

[0017] First component 3 also comprises an inner wall 3b.

[0018] In other words, in actual use, second component 4 is screwed to first component 3, and projections 8 of second component 4 are substantially screwed to projections 9 of first component 3.

[0019] As shown in Figure 2, first component 3 comprises an annular cavity 10 between outer wall 3a and inner wall 3b.

[0020] Outer wall 3a in turn comprises a portion 11a which narrows outwards to form a lead-in as explained in detail below.

[0021] An annular shoulder 14 is defined on outer wall 3a, inside annular cavity 10.

[0022] In the Figure 1 and 2 embodiment, lid CP has an outlet BC with a central axis of symmetry (A) off-centred with respect to the central axis of symmetry (B) of container 2 as a whole.

[0023] In another embodiment, not shown, outlet BC may obviously be coaxial with lid CP.

[0024] Outlet BC is provided with a collar 15 having two portions 15a, 15b of different diameters and so defining an annular shoulder 15c in between. More specifically, portion 15a is the larger in diameter.

[0025] In an embodiment not shown, annular shoulder 15c is on a level with lid CP.

[0026] Wall 3b is vertically longer than wall 3a, and is formed with an annular shoulder 16, and a portion 11b also forming a lead-in (see below).

[0027] One of the characteristics of the present invention, in fact, lies in annular shoulder 15c of collar 15 resting on shoulder 16 on wall 3b of first component 3.

[0028] In other words, in the Figure 1 and 2 embodiment, walls 3a, 3b of first component 3 have respective annular shoulders 14, 16, on which a U-shaped edge 13 of collar 15 and annular shoulder 15c of collar 15 rest respectively.

[0029] The double overlap fit (13-14; 15c-16) between first component 3 of cap 1 and collar 15 represents one of the main characteristics of the present invention.

[0030] Also very important are the lead-ins formed by portions 11a and 11b, which assist insertion of edge 13 inside cavity 10 when fitting cap 1 to collar 15.

[0031] Inner wall 3b also comprises a number of cavities 11c equally spaced along the whole perimeter of inner wall 3b, and which enable full pour-out of the product from container 2, by extending up to annular shoulder 15c on collar 15, and so preventing the product from penetrating into the underside gap SQ formed between annular shoulder 15c and portion 11b of wall 3b.

[0032] Figure 5 shows the substantially semicircular collar 15 used in the Figure 1 and 2 embodiment.

[0033] Figures 6 and 7 show another two embodiments of the collar.

[0034] Figure 6, for example, shows a collar 15* with a gable-type edge 13*.

[0035] Figure 7 shows a collar 15** with a curled edge 13**.

[0036] The other details of collars 15* and 15** are the same as for collar 15.

[0037] Collars 15* and 15** can therefore be fitted to caps 1 of the type shown in Figure 2.

[0038] In actual use, once filled with the product, container 2 is positioned beneath a store (not shown) of caps 1; and a cap 1 is withdrawn from the store and pressed onto outlet BC. As the cap is pressed on, edge 13 of collar 15 is inserted inside cavity 10 until the free end of edge 13 comes to rest on annular shoulder 14 of first component 3.

[0039] At the same time, annular shoulder 15c of collar 15 comes to rest on shoulder 16 of first component 3.

[0040] In other words, a double click-on connection is formed between cap 1 and collar 15.

[0041] Figure 3 shows a second embodiment of cap 1, which comprises a plastic inner partition 20 formed in one piece with first component 3 and perpendicular to the axis (A) of cap 1. A tear-off portion 21 is formed along the connecting edge between partition 20 and inner wall 3b of first component 3; and a tab 22, integral with partition 20, is fixed to the outer face 20a of partition 20 to serve as a grip by which to tear partition 20 off first component 3, after first unscrewing second component 4 off first component 3.

[0042] The other details of the second embodiment in Figure 3, and in particular the connection between first component 3 of cap 1 and collar 15, are the same as in the first embodiment in Figure 2.

[0043] Figure 4 shows a third embodiment of the present invention.

[0044] In the third embodiment, any details identical or similar to those of the other two embodiments are indicated as far as possible using the same reference numbers.

[0045] In the third embodiment in Figure 4, wall 3b of first component 3 is elongated to substantially form a bellows SF, the end portion of which has projections 9 which are engaged, as already seen, by projections 8 on second component 4. In other words, second component 4 is screwed onto first component 3.

[0046] Second component 4 comprises a circular plate 24 divided into a circular central first portion 24a and an annular peripheral second portion 24b, which are joined by a number of radial segments 24c and by two radial bridges 24d. The radial bridges 24d divide annular peripheral second portion 24b into two arcs 24b* and 24b**.

[0047] To open container 2, one user (not shown) lifts the two arcs 24b*, 24b** in the direction of arrow F to break segments 24c. The diametrically opposite radial bridges 24d do not break, and serve to ensure mechanical connection between circular central first portion 24a and annular peripheral second portion 24b even after segments 24c are broken by the user.

[0048] At this point, the two arcs 24b* and 24b**, both brought together into an upright position, form a finger grip for the user who then pulls the grip upwards to upwardly distend bellows SF. The user can now unscrew second component 4 off first component 3 to expose a partition 20 with a tear-off portion 21 as described with reference to Figure 3.

[0049] The Figure 4 embodiment is particularly suitable for containers 2 containing liquid that is dangerous to handle, and when optimum sealing of the liquid is desired.

[0050] The advantages of the present invention will be clear from the above description.

[0051] In particular, cap 1 can be pressed onto outlet BC in the lid of container 2, i.e. by exerting force on cap 1 in the direction of outlet BC, and can therefore be fitted to outlet BC with no need for particularly complicated automatic machines, on account of cap 1 simply being pressed onto collar 15.

[0052] Another point to note is that fitting the cap to the outlet poses no problems and calls for no particular precautions, regardless of the material from which container 2 is made, or the position of outlet BC on lid CP. Moreover, cap 1 can be fitted to collar 15 without the two having to be aligned accurately, on account of first component 3 defining a lead-in (portion 11a) for the outwardly bent portion of edge 13, and another lead-in (portion 11b) for the part of edge 13 connected to the top cylindrical portion of collar 15.

[0053] As stated, the double overlap fit (13-14; 15c-16) between first component 3 of cap 1 and collar 15 represents one of the main characteristics of the present invention, ensures firm grip of collar 15 to cap 1, and so prevents random movement between the two resulting in leakage.

[0054] Finally, the same cap 1 can be used on collars

15 with differently shaped edges 13 (Figures 5, 6, 7).

Claims

1. A container (2) fitted with a cap (1); said cap (1) being **characterized by** comprising:

- a first component (3) made of plastic material; and
- a second component (4) made of plastic material and screwed onto said first component (3);

said first component (3) having an annular cavity (10) defined by a first wall (3a) and a second wall (3b); the first and second wall (3a)(3b) each having a respective annular shoulder (14)(16) on which an edge (13; 13*; 13**) of a fastening collar (15; 15*; 15**) and an annular shoulder (15c) of the fastening collar (15; 15*; 15**) rest respectively.

2. A container (2) as claimed in Claim 1, **characterized in that** the first wall (3a) has a first portion (11a), and the second wall (3b) has a second portion (11b); said first and second portion (11a, 11b) defining a lead-in for said edge (13; 13*; 13**) as it is inserted inside said annular cavity (10).

3. A container (2) as claimed in any one of the foregoing Claims, **characterized in that** said first component (3) is defined by an annular body, on the outer cylindrical wall (3a) of which are formed helical projections (9) to which said second component (4) is screwed.

4. A container (2) as claimed in Claim 1, **characterized in that** one wall (3b) of the first component (3) is elongated to substantially form a bellows (SF) having projections (9) on its end portion.

5. A container (2) as claimed in Claim 4, **characterized in that** the second component (4) comprises a circular plate (24) divided into a circular central first portion (24a) and an annular peripheral second portion (24b); the two portions (24a, 24b) being joined by a number of radial segments (24c) and by two radial bridges (24d).

6. A container (2) as claimed in Claim 5, **characterized in that** the radial bridges (24d) divide the annular peripheral second portion (24b) into two arcs (24b*, 24b**); and **in that**, to open the container (2), one user lifts the two arcs (24b*, 24b**) in a given direction (F) to break said radial segments (24c) and form a finger grip.

7. A container (2) as claimed in any one of the foregoing Claims, **characterized in that** said first component (3) has an inner partition (20) made of plastic material, preferably in one piece with the first component; a tear-off portion (21) being formed along the connecting edge between said inner partition (20) and the inner face of said first component (3).

8. A container (2) as claimed in Claim 7, **characterized in that** a tab (22) is fixed, preferably integrally, to the outer face of the inner partition (20) to serve as a grip by which to tear off the inner partition (20).

9. A container (2) as claimed in any one of the foregoing Claims, **characterized in that** the edge (13) of the fastening collar (15) is substantially semicircular.

10. A container (2) as claimed in any one of Claims 1 to 8, **characterized in that** the edge (13*) of the fastening collar (15*) is substantially gable-shaped.

11. A container (2) as claimed in any one of Claims 1 to 8, **characterized in that** the edge (13**) of the fastening collar (15**) is substantially curled.

12. A container (2) as claimed in any one of the foregoing Claims, **characterized in that** the second wall (3b) has cavities (11c) equally spaced along the whole perimeter of the second wall (3b).

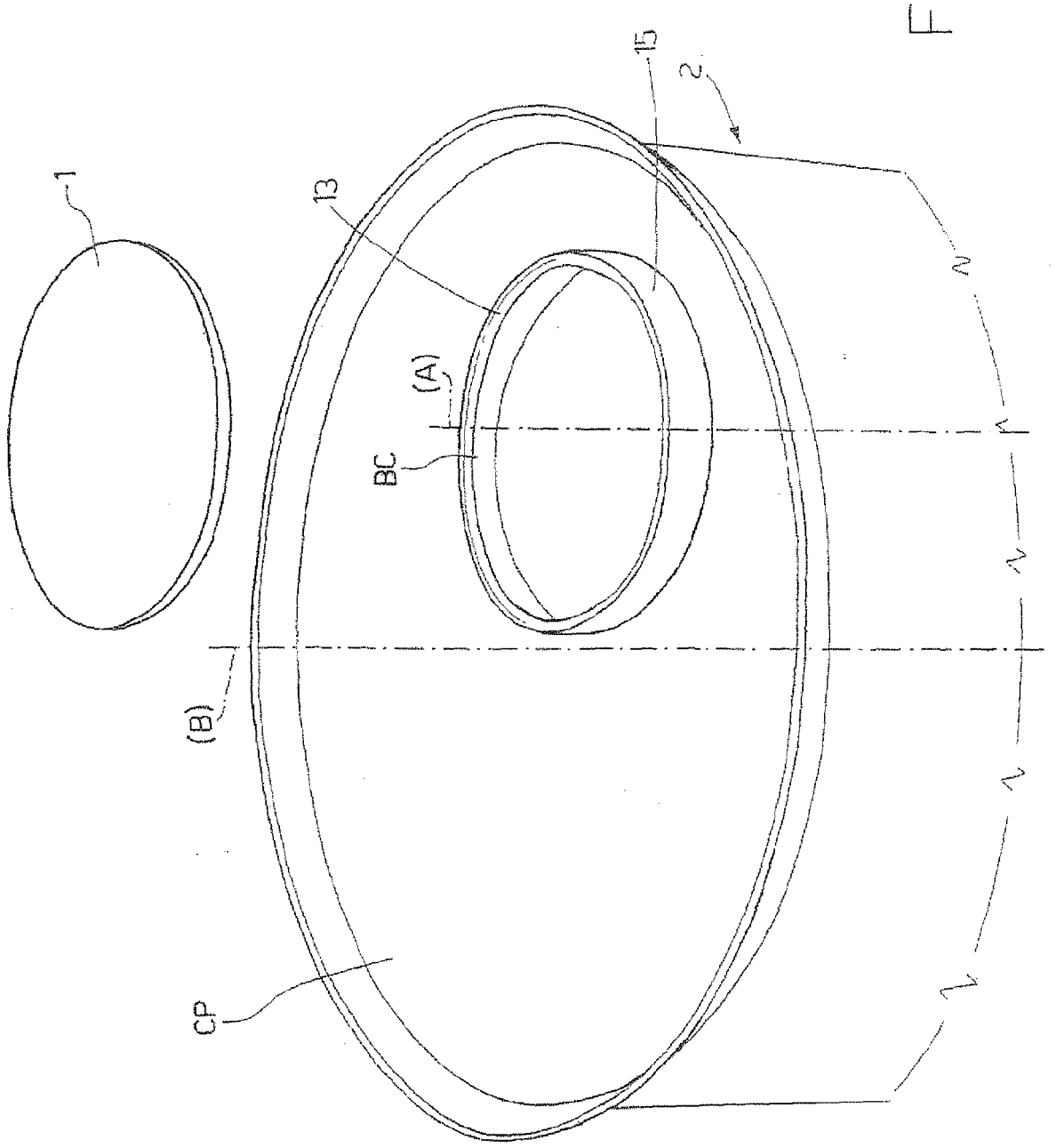
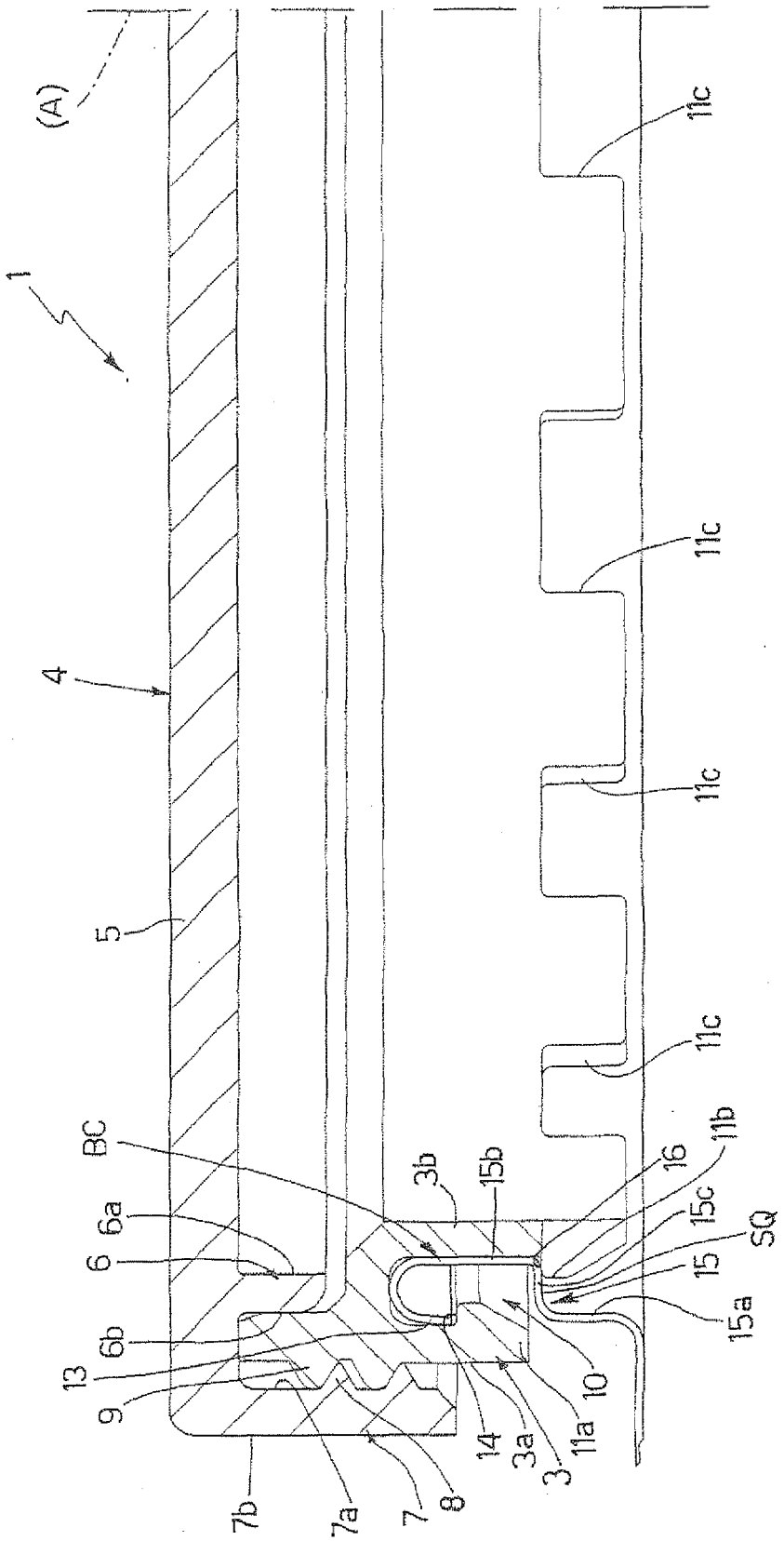


Fig.1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11c
BC
6a
6
6b
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9
7b
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7
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3
11a
10
3b
15b
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15c
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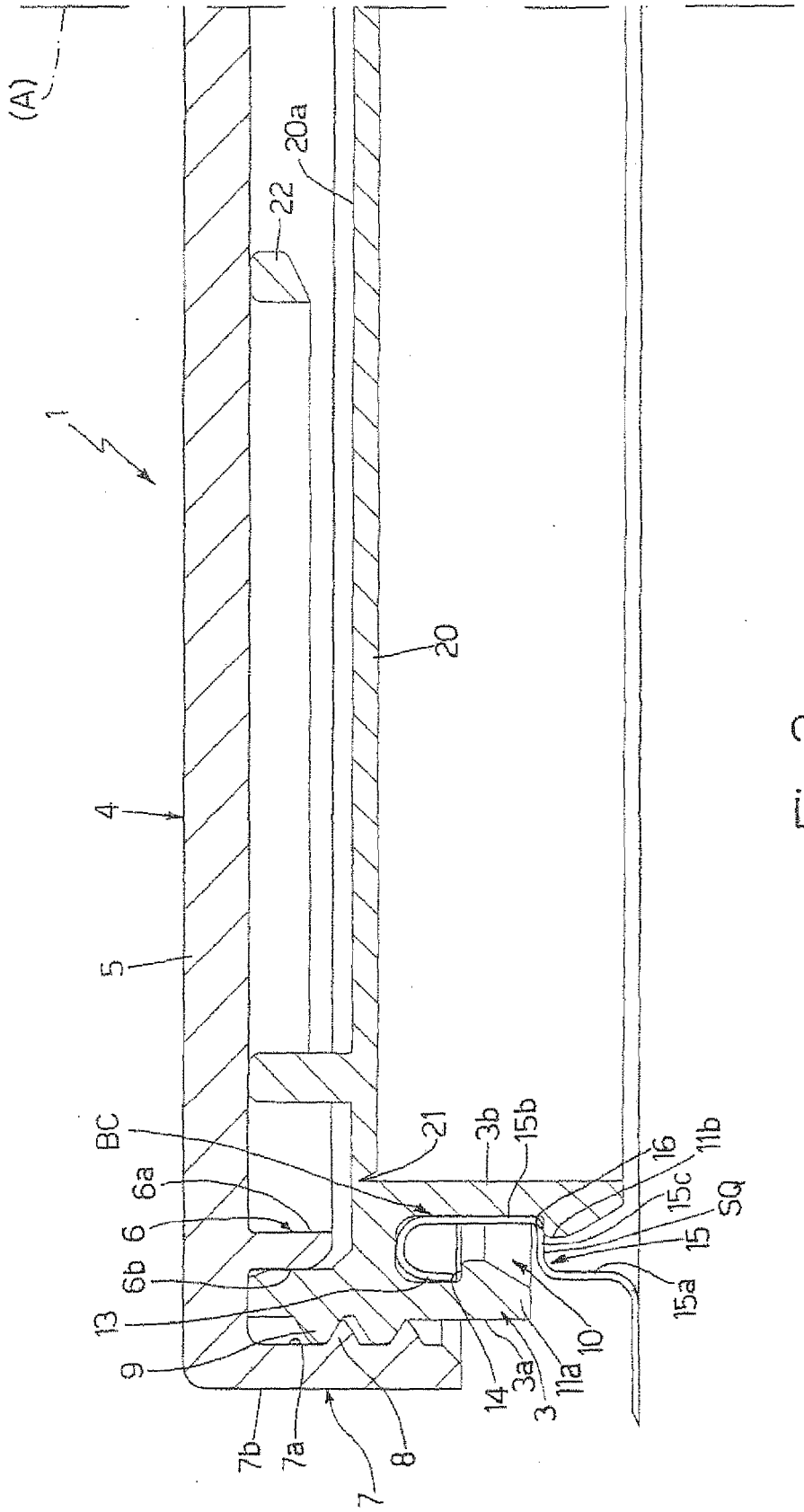
SQ
15a

Fig.2


(A)
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4
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13
9
7b
7a
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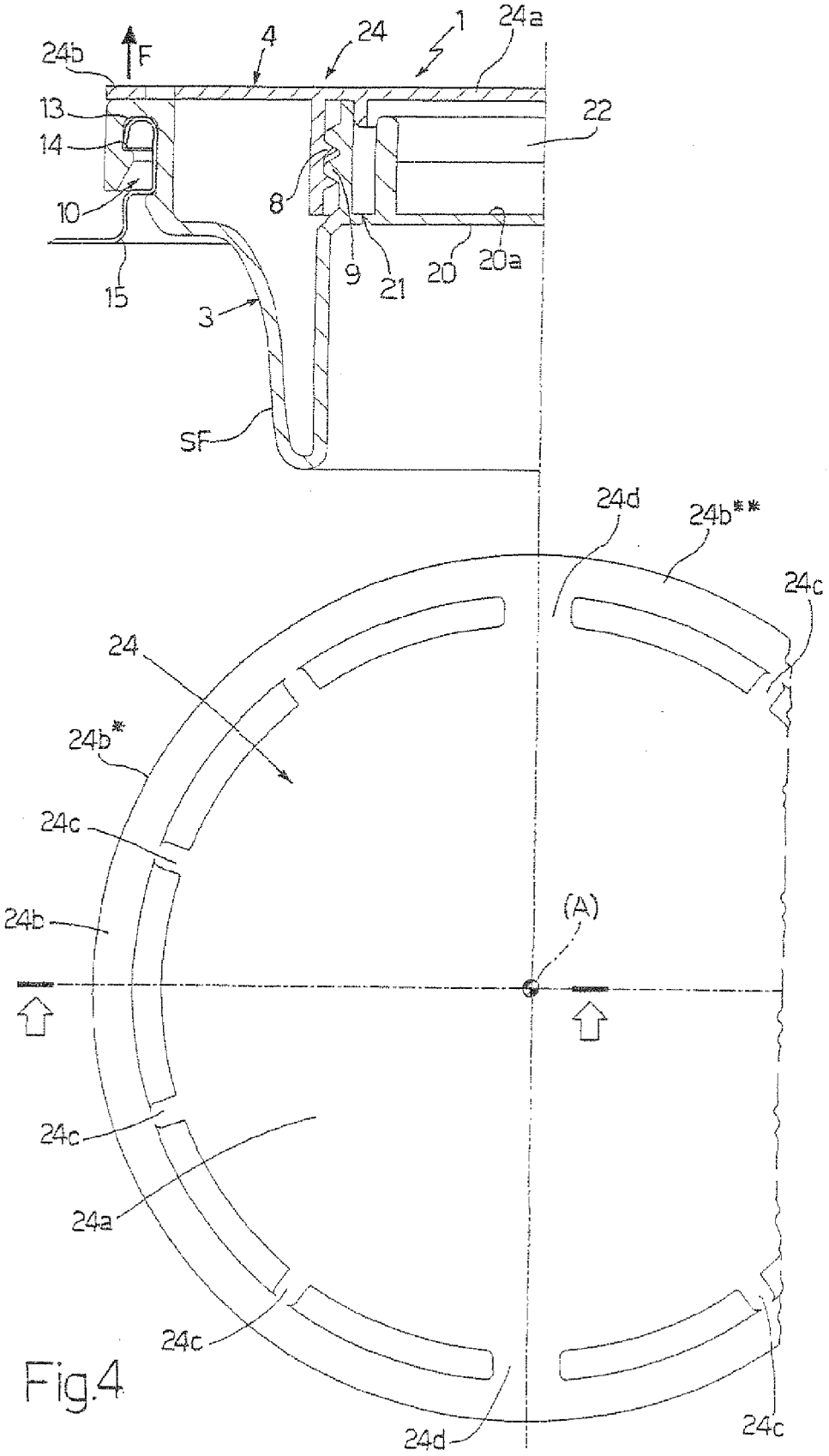
3a
3
11a

Fig.3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24a
13
14
10
15
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9
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20
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22
24d
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Fig.4

Fig.5

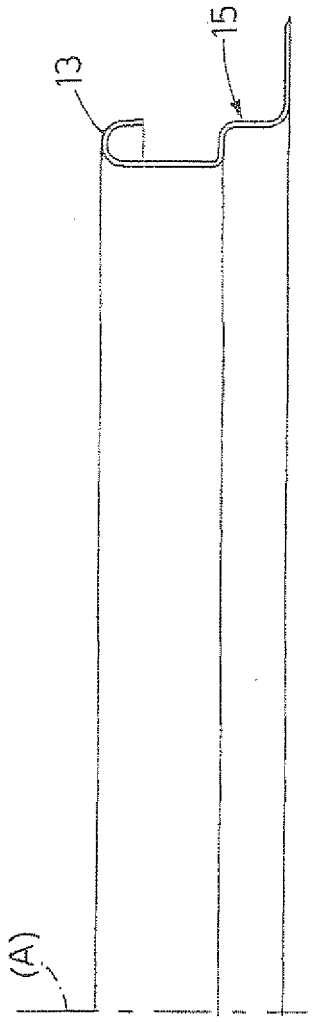

Fig.6

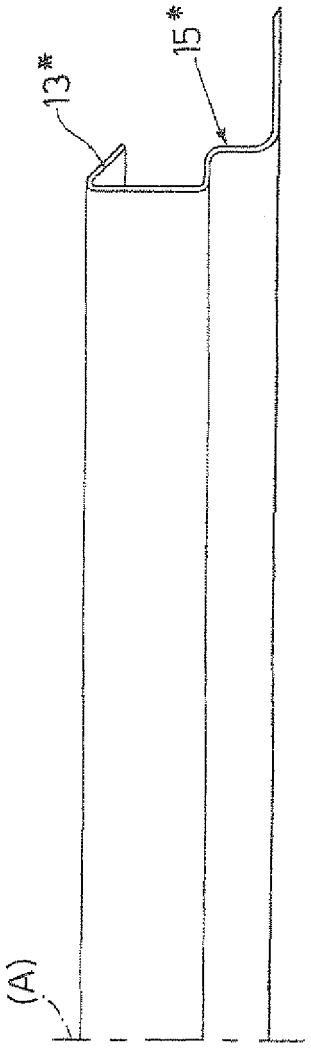

Fig.7