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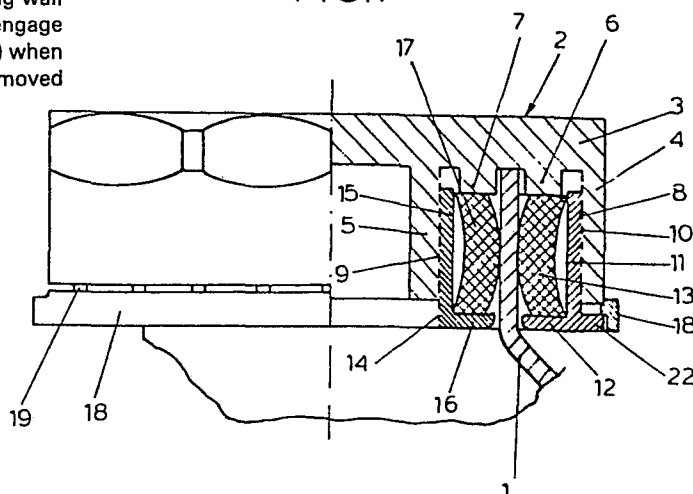
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**54** Closing cap, especially for the nozzle of a container of synthetic material.

**57** Closing cap, especially for the nozzle (1) of a container of synthetic material, said cap (2) comprising a closing wall (3), a cylindrical outer casing (4) and a cylindrical inner casing (5) which by means of screw thread (8,9,10,14) or such-like means co-operate with related push rings (11,15), each being provided with a radial extending collar (12,16). Sealing sleeves (13,17) are provided between each of said collars (12,16) and a related collar section (6,7) of said closing wall (3), which sealing sleeves (13,17) are compressed to engage the adjacent outer or inner wall resp. of said nozzle (1) when by turning the cap (2) the push rings (11,15) are moved axially toward the closing wall (3).

FIG.1



Closing cap, especially for the nozzle of a container  
of synthetic material.

The invention relates to a closing cap, especially for  
the nozzle of a container of synthetic material, said cap  
consisting of a closing wall, which is perpendicular  
to the centre line of the nozzle, of a cylindrical outer  
5 casing, directed away from this wall, which encloses  
the nozzle and which is provided with internal screw  
thread or such-like means, and of a sealing means which by  
turning the cap can be clamped between the cap and the  
nozzle.

10 Such closing caps are used at a large scale for closing  
the nozzle of so-called jerrycans. Especially when such  
containers are made of synthetic material by means of  
blowing in a die, the problem occurs that no complete  
sealing can be obtained when the nozzle is provided with  
15 external screw thread and the cap with internal screw  
thread, as the nozzle only can have a limited wall thickness,  
so that also the force with which the cap is screwed on  
the nozzle must remain limited. In consequence of this  
the sealing means, in the shape of a disc of flexible  
20 material which is pressed between the end rim of the nozzle  
and the closing wall of the cap, is often not compressed  
enough to assure a permanently good sealing.

As the nozzle at the place of the die partition is  
usually not provided with screw thread, as this thread  
25 might show irregularities at the die partition, the  
possibility exists that the cap is screwed on the nozzle  
obliquely, so that the risk of a less good sealing is  
increased even more.

It is the purpose of the present invention to overcome these drawbacks by providing a closing cap, which is characterized in that the outer casing by the screw thread or such-like means co-operates with an outer cylindrical  
5 push ring, which in the position of use of the cap is at least partially within the outer casing and which is provided with an inwards directed collar at the end which is turned away from the closing wall of the cap, between which collar and the closing wall of the cap an outer  
10 sealing sleeve is accomodated, which when the cap is used is slid over the outer wall of the nozzle and prevents the ring from turning with respect to the nozzle, in such a way that by turning the cap the push ring can be brought towards the closing wall for the longitudinal  
15 compression of the sealing sleeve so as to lie at least against the outer wall of the nozzle, the cap furthermore being provided with a cylindrical inner casing and with an inner push ring around it, which casing and ring by means of screw thread or such-like means co-operate  
20 with one another, said inner push ring being provided with an outwards directed collar for receiving an inner cylindrical sealing sleeve between this collar and the closing wall, in such a way that when the cap is turned also this inner sealing sleeve is compressed in the  
25 longitudinal direction so as to lie at least against the inside wall of the nozzle of the container.

With such a closing cap the wall of the nozzle of the container is inserted between two sealing sleeves, which when the cap is turned, are pressed against the nozzle  
30 from both sides, so that no great forces are exerted on the material of the nozzle, so that there is no risk that the material is torn at the place of the die seam. In this way also a large sealing surface is obtained. Furthermore, the die in which the container is made,  
35 can be simpler, as the nozzle does not have to be provided with screw-thread. Therefore such a die will be considerably less expensive.

Reference can be made to German Offenlegungsschrift  
1,429,908, which describes a closing cap, especially  
for thermos flasks, with which use is made of a sealing  
sleeve, which is provided between two discs, which can  
5 be drawn towards one another to press the sealing sleeve  
outwards against the inner wall of the nozzle of the  
container. Thus the nozzle is loaded internally by radial  
forces. With a container obtained by blowing, this  
involves the risk that the nozzle is torn at the place  
10 of the die seam. Furthermore no internal support of  
the sealing sleeve takes place, so that the risk exists  
that it is buckled inwards.

According to a preferred embodiment of the present  
invention, the closing wall of the cap is provided  
15 with two co-axial cylindrical collar sections between  
the outer casing and the inner casing thereof, which  
sections are positioned in such a way, that between  
the two collars the upper part of the nozzle can be  
received and between each of the collars and the adjacent  
20 casing the upper part of the push ring concerned, the  
sealing sleeves lying against the head surfaces of the  
collars.

In this way a good centring of the closing cap and a good  
support of the sealing sleeves are guaranteed.

25 According to a further elaboration of the invention, the  
outer push ring can be provided with an outwards directed  
collar near the inwards directed collar, the outer  
circumference of which comprises a toothed part, which  
can co-operate with the toothed part of a checking ring,  
30 which by means of tear-off sections is connected with the  
outer casing of the cap, the teeth of the co-operating  
toothed parts being of such a shape, that when the cap is  
screwed tightly on the nozzle of a container, the teeth  
snap over one another, whereas when the cap is unscrewed,  
35 the teeth will grip into one another and the checking ring  
will be torn off the cap.

When such a closing cap is used, it can therefore always been verified, after the cap has been put on, whether the cap was removed from the nozzle already before.

According to a preferred embodiment the toothed parts  
5 are provided on axial, oppositely located surfaces of the collar of the push ring and of the checking ring connected with the outer casing.

The toothed parts are therefore provided on axial cylindrical surfaces, which when the cap is turned will  
10 slide somewhat along each other, which in itself provides no problems.

The space between the closing wall of the cap and the inner casing can be used in a favourable way for accomodating an air bleed valve, which in certain cases is desirable  
15 or required to prevent the pressure in the container from becoming too high. Said space may e.g. also contain a foam material which is absorbing and/or resilient.

The invention will now be explained by means of an example of an embodiment, shown in the drawing, in which:  
20 figure 1 shows a view and a partial section of a closing cap according to the invention, and figure 2 shows a bottom view of a part of the edge of the cap.

In the drawing the nozzle of a container is indicated by  
25 the reference number 1; on this nozzle the closing cap 2 is mounted. The closing cap 2 consists of the closing wall 3 with the outer casing 4 and the inner casing 5 perpendicular thereto. Between the outer casing 4 and the inner casing 5 the collars 6 and 7 are provided.

30 The outer casing 4 is provided with internal screw thread 8 and the inner casing 5 with external screw thread 9. With the thread 8 the external thread 10 of a push ring 11 co-operates, which ring is provided with an inwards directed collar 12, between the collars 6 and 12 a resilient

sealing sleeve 13 being provided.

In a similar way a screw thread 14 of an inner push ring 15 co-operates with the screw thread 9 of the inner casing 5. The push ring 15 is provided with an outwards directed collar 16 and between the collars 7 and 16 there is an inner resilient sealing sleeve 17.

When the closing cap 2 is used, the push rings 11 and 15 are screwed into the casing 4 and 5, respectively, whereas simultaneously the sealing sleeves 13 and 14 are mounted. The push rings 11 and 15 are screwed in so far, that the sealing sleeves 13 and 17 are bent slightly towards one another, so that when the closing cap is placed on the nozzle 1, the sealing sleeves 13 and 17 are lying resiliently against the wall of the nozzle 1. After the closing cap 2 has been pressed on the nozzle 1 so far that the upper edge of the nozzle 1 is located between the collars 6 and 7, the closing wall 3 with the outer casing 4 is turned, the push rings 11 and 15 being prevented from turning by their co-operation with the sealing sleeves, which press firmly against the wall of the nozzle 1. The push rings 11 and 15 will thereby move inwards in the cap and press the sealing sleeves more firmly against the wall of the nozzle 1.

The way of deformation of the sealing sleeves 13 and 17 will be dependent on the original shape thereof and on the properties of the material of which the sleeves are made. Therefore it is possible, in contrast with the drawing, that the sealing sleeves remain lying over their entire length against the corresponding push ring.

Although an embodiment has been discussed and has been shown in the drawing, in which the casing and the push ring co-operate by means of screw thread, it will be obvious that use can also be made of a bayonet joint, in which case a certain axial displacement between the casing and the push ring will occur.

In order to check whether a closing cap, after its first mounting on a nozzle, has been removed therefrom already before, the outer casing 4 may be provided with a checking ring 18, which by means of small lips 19 is connected  
5 with the outer casing 4.

As appears from Figure 2, the inner surface of the checking ring 18 is provided with teeth 20, which co-operate with teeth 21, provided on the outer surface of a collar 22 of the push ring 11. The teeth 20 and 21 have such a shape  
10 and are made of such a material, that when the casing 4 is turned together with the checking ring 18 in the direction of the arrow P, the teeth 20 of the ring 18 will snap over the teeth 21 of the collar 22. When it is tried, however, to turn the closing cap 2 in the  
15 direction opposite to the arrow P, the teeth 20 will be held back by the teeth 21, so that on the ring 18 a holding force will be exerted and the lips 19 between the ring 18 and the casing 4 will be torn.

It may further be observed that under certain circumstances  
20 it has appeared to be favourable to carry out the closing cap in such a way, that the collar 16 of the inner push ring 15 comes to lie lower than the point where the nozzle merges into the upper wall of the container. By this the resilient sealing sleeve 17 is deformed in a slightly  
25 different way and an improved grip of the closing cap on the nozzle is obtained, also at a very low coefficient of friction between the sealing sleeve and the nozzle wall.

It will be obvious that only one possible embodiment of the closing cap according to the invention has been  
30 described and that numerous modifications can be applied without leaving the scope of the invention.

Claims:

1. Closing cap, especially for the nozzle (1) of a container of synthetic material, said cap (2) consisting of a closing wall (3), which is perpendicular to the centre line of the nozzle, of a cylindrical outer casing (4), directed away from this wall (3), which  
5 encloses the nozzle (1) and which is provided with internal screw thread (8) or such-like means, and of a sealing means which by turning the cap can be clamped between the cap and the nozzle,  
10 characterized in that the outer casing (4) by the screw thread (8) or such means co-operates with an outer cylindrical push ring (11), which in the position of use of the cap is at least partially within the outer casing (4) and  
15 which is provided with an inwards directed collar (12) at the end which is turned away from the closing wall (3) of the cap (2), between which collar (12) and the closing wall (3) of the cap (2) an outer sealing sleeve (13) is accommodated, which when the cap (2) is  
20 used is slid over the outer wall of the nozzle (1) and prevents the ring (11) from turning with respect to the nozzle (1), in such a way that by turning the cap (2) the push ring (11) can be brought towards the closing wall (3) for the longitudinal compression  
25 of the sealing sleeve (13) so as to lie at least against the outer wall of the nozzle (1), the cap (2) furthermore being provided with a cylindrical inner casing (5) and with an inner push ring (15) around it, which casing (5) and ring (15) by means of screw thread  
30 (9,14) or such-like means co-operate with one another, said inner push ring (15) being provided with an outwards directed collar (16) for receiving an inner cylindrical sealing sleeve (17) between this collar (16) and the closing wall (3) in such a way that when the cap  
35 (2) is turned also this inner sealing sleeve (17) is compressed in the longitudinal direction so as to lie at least against the inside wall of the nozzle (1) of the container.



2. Closing cap according to claim 1,  
characterized in  
that the closing wall (3) of the cap (2) is provided  
with two co-axial cylindrical collar sections (6,7)  
5 between the outer casing (4) and the inner casing (5)  
thereof, which sections (6,7) are positioned in such  
a way, that between the two collars (6,7) the upper  
part of the nozzle (1) can be received and between  
each of the collars (6,7) and the adjacent casing (4,5)  
10 the upper part of the push ring (11,15) concerned,  
the sealing sleeves lying against the head surfaces  
of the collars.
3. Closing cap according to claim 1 or 2,  
characterized in  
15 that the outer push ring (11) is provided with an  
outwards directed collar (22) near the inwards directed  
collar (12) the outer circumference of which comprises  
a toothed part (21) which can co-operate with the  
toothed part (20) of a checking ring (18), which by  
20 means of tear-off sections (19) is connected with  
the outer casing (4) of the cap (2), the teeth of the  
co-operating toothed parts (20,21) being of such a  
shape, that when the cap (2) is screwed tightly on the  
nozzle (1) of a container, the teeth (20,21) snap over  
25 one another, whereas when the cap (2) is unscrewed,  
the teeth (20,21) will grip into one another and the  
checking ring (18) will be torn of the cap (2).
4. Closing cap according to claim 3,  
characterized in  
30 that the toothed parts (20,21) are provided on axial,  
oppositely located surfaces of the collar (22) of the  
push ring (11) and of the checking ring (18) connected  
with the outer casing (4).
5. Closing cap according to one or several of the preceding  
35 claims,  
characterized in  
that in the space between the closing wall (3) of the

cap (2) and the inner casing (5) an air bleed valve is accomodated.

6. Closing cap according to claims 4 or 5,  
characterized in
- 5 that in the space between the closing wall (3) of the  
cap (2) and the inner casing (5) a foam material  
is placed, which is absorbing and/or resilient.

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FIG.1

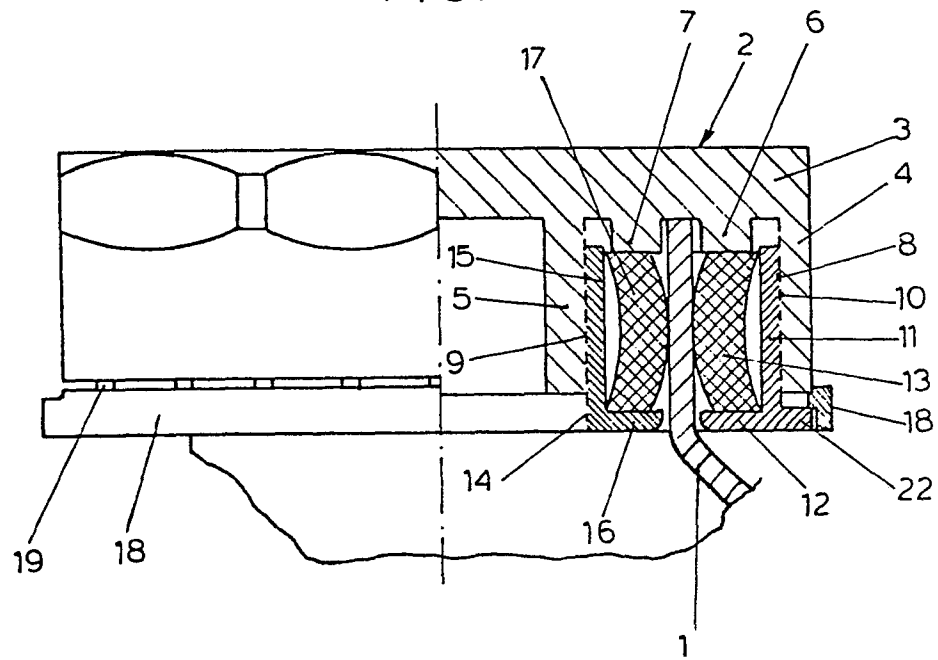
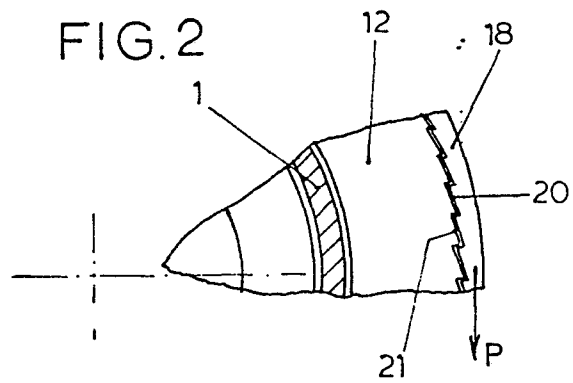


FIG.2



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European Patent  
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# EUROPEAN SEARCH REPORT

0052906

Application number  
EP 81201297.9

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. <sup>3</sup> )
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
D, A	<p><u>DE - A - 1 429 952</u> (HELIOS BULLE &amp; CO)</p> <p>* Fig. *</p> <p>--</p>	1, 2	B 65 D 39/12 A 47 J 41/02
	<p><u>DE - B - 1 293 980</u> (BARTH)</p> <p>* Fig. *</p> <p>--</p>	1, 2	
	<p><u>DE - A - 1 429 908</u> (CURT FRÖHLICH KG)</p> <p>* Fig. 1 *</p> <p>--</p>	1	TECHNICAL FIELDS SEARCHED (Int. Cl. <sup>3</sup> )
	<p><u>DE - B - 1 089 292</u> (VAESSEN-SCHOEMAKER HOLDING)</p> <p>* Fig. 4 *</p> <p>--</p>	1	B 65 D 39/00 B 65 D 41/00 B 65 D 43/00 B 65 D 55/00 A 47 J 41/00
	<p><u>DE - A1 - 2 638 385</u> (PROT S.R.I.)</p> <p>* Fig. 5,6 *</p> <p>----</p>	3, 4	
			CATEGORY OF CITED DOCUMENTS
			<p>X: particularly relevant</p> <p>A: technological background</p> <p>O: non-written disclosure</p> <p>P: intermediate document</p> <p>T: theory or principle underlying the invention</p> <p>E: conflicting application</p> <p>D: document cited in the application</p> <p>L: citation for other reasons</p>
			&: member of the same patent family, corresponding document
X	The present search report has been drawn up for all claims		
Place of search VIENNA		Date of completion of the search 16-C2-1982	Examiner CZUBA