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(71) Applicant: **CAPSULIT S.P.A.**
Corso Indipendenza, 6
I-20129 Milano(IT)

(72) Inventor: **Rizzardi, Napoleone**
Via Zambeletti 10
I-20129 Milan(IT)

(74) Representative: **La Ciura, Salvatore**
c/o STUDIO D'ORIO Via F. Sforza, 3
I-20122 Milan(IT)

(54) A Safety closure particularly for medicine holding bottles or the like.

(57) A security closure medicine-holding bottles comprising an internal capsule to be screwed to the neck of a bottle, and an external covering cap, mounted to said capsule, the closure including pairs of teeth (8) and (19) respectively provided on a plane wall (3) of the capsule, on the outside thereof, and on a plane wall (17) of the cap, on the outside thereof, said teeth having plane surfaces intended for engagement with one another when the external cap is rotated in a direction to open the bottle, said cap being capable of axially sliding with respect to said capsule.

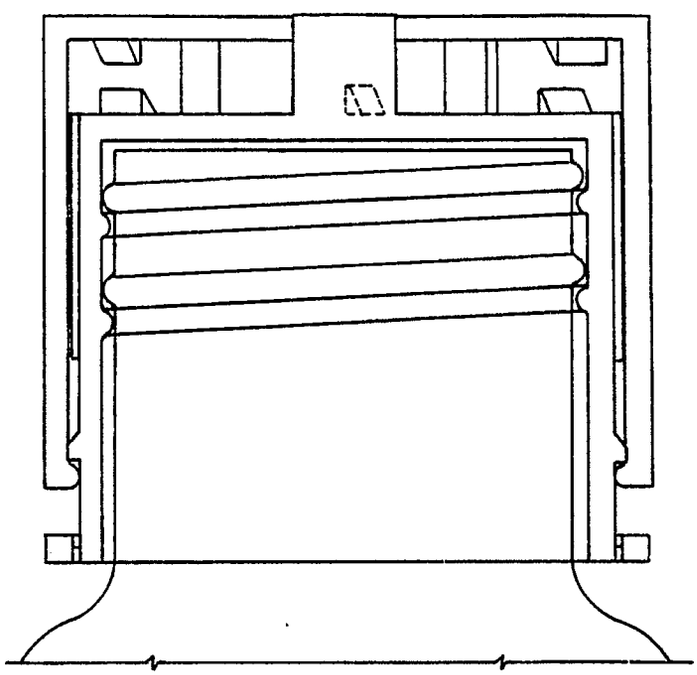

FIG. 5

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This invention relates to a safety closure for medicine-holding bottles or the like.

In particular, the invention relates to a capsule of a so-called "childproof" type, that is to say one designed so that a certain skill and a certain force are required for opening the capsule, thereby to prevent a child from being able to open it.

Closures of this type are already known and are manufactured entirely from plastic material or in part from plastic and in part from metal material such as, for example, aluminium.

These closures generally comprise an internal capsule or cover that is tightly fitted to a neck of a bottle, and an external cap that covers the capsule and is arranged so that the cap is free to rotate with respect to the capsule but is capable of being brought into engagement with the capsule to open the bottle.

As mentioned above, these closures are designed in such a manner that a certain force of compression is required to bring the capsule and the external cap into engagement with one another, while rotating the cap at the same time.

The manufacture of this type of closure entirely from plastic material, though being preferred in respect of cost, gives rise to some difficulties due in particular to the necessity of providing the closure with a seal or other security means against any tampering.

Another problem resides in that it is difficult to obtain closure devices that are practical and safe in operation in spite of the elastic and deformable nature of the material generally employed for manufacturing them.

In order to overcome the above difficulties, this invention provides a closure device of the type as referred to above, which is simple in construction, safe in operation and cost-efficient in manufacture.

The closure of the invention is provided with a security means and owing to a particular configuration of its components this closure is extremely practical for use in those plants which utilize automatic machines for filling and closing bottles.

More particularly, the closure according to the invention comprises a capsule made of plastic material and intended for fitting to the neck of a bottle, the capsule having, at a lower part thereof, a rib designed to engage with an annular border on the neck of a bottle for keeping the capsule in position, and, at an upper part thereof, a jutting-out formation to serve as an abutment or stop means for the head of a packaging machine to limit the stroke of this latter so as to avoid that during the time the capsule is applied to the bottle neck said stroke is continued to a point where fracture of the security means occurs.

The capsule has on its outside a plurality of teeth for engagement with corresponding teeth on the inside surface of the covering cap, the shape and arrangement of these teeth being such as to ensure that the capsule and the cap can engage with one another only during screwing down or when, in the case of rotation in a direction to open the capsule, a certain compression force is applied to the cap.

The invention will now be described in more details with reference to the accompanying drawings, in which:

Figure 1 is a sectional view of an internal capsule in a closure according to the invention;

Figure 2 is a top view of the capsue in figure 1;

Figure 3 is a sectional view of an external cap in a closure according to the invention;

Figure 4 is a bottom view of the cap in figure 3;

Figure 5 is a sectional view of the closure device when mounted, in a rest position; and

Figure 6 is a sectional view of the closure device when mounted but in a position of use for openining a bottle.

Referring now to figures 1 and 2, an internal capsule of a closure according to the invention is generally indicated by reference numeral 1 and has an internal threading 2 for screwing the capsule to the neck of a bottle, the capsule being closed at the top by a plane wall 3.

The capsule is provided at a central region of its top wall with a substantially cylindrical projection 7 and, at a peripheral region thereof, with a plurality of teeth 8 each having a substantially vertical wall 9 and a sloping wall 10. Provided on the outside of the capsule 1 are series of vertical ribs 11 which extend from an upper edge of the capsule to halfway down the height of its sidewall 4.

As seen in a horizontal sectional view (particularly in figure 2), the ribs 11 have a radially directed wall 12 and a sloping wall 13.

Moreover, the capsule has on its outside surface a raised annular formation 14 and, at a lowermost end thereof, a security strap in the form of a ring 15 that is connected to the capsule through a weakness or anticipated line of fracture 16.

The external cap (figures 3 and 4) of the closure has a central hole 18 formed in the top wall 17 of the cap, which hole 18 is not smaller in diameter than the projection 7 on capsule 1.

Jutting out of the inside surface of the cap top wall 17, are a plurality of teeth 19 having each vertical and sloping walls as in the case of teeth 8 on capsule 1.

The teeth 19 correspond in number and position to said teeth 8.

Provided on the inner sidewalls of the cap are series of ribs 20 having each a radial and a sloping wall and arranged in position, so as to match the

external ribs 11 on capsule 1.

Furthermore, the cap has at its lowermost end an inner annular rim 22.

As will be clearly apparent from the drawings, the ribs 11 and 20 are so orientated as to engage with one another when the cap is rotated in a screwing direction, and to slip over one another when the cap is rotated in a reverse direction.

Upon fitting the capsule to a bottle, the projection 7 on the capsule will act as an abutment means for preventing a head or spindle operating to screw the capsule to the neck of a bottle, from excessively advancing such that there is a risk for the security strap 15 to be torn off.

The external cap is fitted to the capsule by pressing the cap down. The lower inner annular rim 22 of the cap is first resiliently deformed so as to slip over the upper inclined wall of the raised formation 14 on the capsule, whereafter said rim 22 will snap back to a closed position in which the cap is prevented from slipping off.

The cylindrical projection 7 on the capsule fits into the opening 18 in the cap. If, under these conditions, the external cap is rotated in a direction to open the closure, the inclined walls of the ribs 20 in the cap will slip over the matchingly inclined walls of ribs 11 on the capsule, owing to elastic deformable nature of the different components, butwithout the capsule being able to be taken apart.

In order to open the bottle it is, on the contrary, necessary to force the external cap downwardly and to keep it depressed by exerting a certain force while rotating at the same tipe the assembly to screw out the capsule. In this case too, the rotational force is transferred from the cap to the capsule through the matching inclined walls of teeth 8 and 19 and, as a result, in order to overcome resistance to unscrewing, it is necessary that a sufficient compression force be maintained during operation.

The height of the external cap is the same as, or greater than the height of the capsule, more particularly, the distance D (figure 3) of the lowermost end of teeth 19 to the lower edge of the external cap is equal to or greater than the distance d (figure 1) of the upper edge of teeth 8 to the upper edge of the security strap 15. In this manner, the displacement that is to be imparted to the external cap in order to bring the teeth 19 into engagement with the teeth 8 causes fracture and taking apart of the security strap 15.

In order to close the bottle again it is, on the contrary, sufficient to rotate the external cap in a direction to close the assembly, which causes the ribs 20 and 11 to engage with one another and, thus, the capsule to rotate, whereby the capsule is screwed again to the neck of the bottle.

In order to open again, it will each time be necessary to exert the required force of compression, which force will depend on the inclination of the walls of teeth 8 and 19.

The necessity for this compression force to be exerted at the same time as the cap is rotated, will practic ally eliminate any possibility of a child being able to open the bottle.

On the contrary, screwing down of the closure device can be performed without any particular manipulations, it being sufficient for the external cap to be rotated in the proper direction.

It should be apparent that the invention is not limited to the particular embodiment thereof that has been described herein before and shown in the accompanying drawings, and several changes as to the details of construction may be made thereto without departing frome the scope of the invention, as defined in the appended claims.

Claims

1. A security closure in particular for fitting to medicine-holding bottles or the like, of the type comprising an internal capsule of plastic material to be screwed to the neck of a bottle, and an external covering cap, also made of plastic material, mounted to said capsule, characterized in that the closure includes pairs of teeth (8) and (19) respectively provided on a plane wall (3) of the capsule, on the outside thereof, and on a plane wall (17) of the cap, on the outside thereof, said teeth having plane surfaces that are intended for engagement with one another when the external cap is rotated in a direction to open the bottle, said cap being capable of axially sliding with respect to said capsule.

2. The security closure according to claim 1, wherein ribs (11) and (20) are provided on the outer sidevall of the capsule (1) and the inner sidewall of the cap, respectively, said ribs (11,20) being so orientated as to engage with one another when the closure is rotated in a screwing direction, and to slide over one another when the closure is rotated in an opposite direction to the screwing direction.

3. The closure according to claims 1 and 2, wherein an external security strap is provided at the lower edge of the capsule and is connected to said capsule through a weakness line, the distance between the upper edge of said strap and the upper edge of the teeth on the plane wall of the capsule being less than the distance between the lower edge of the external cap and the lower edge of the teeth on the plane wall of said cap.

4. The security closure according to any of the preceding claims, wherein a projection (7) is pro-

vided on the plane wall of the capsule and functions as an abutment for the head or spindle of an apparatus for mounting the capsule.

5. The security closure according to any of the preceding claims, wherein the outer cap has at a lower part thereof an inner annular rim (22) for engagement with a corresponding outer annular raised formation (14) on the capsule in order to prevent the cap from slipping off, said annular raised formation (14) being provided at a distance to the upper edge of the security strap which is not less than the sum of the heights of teeth (8) and (19) provided on the capsule and the outer cap, respectively.

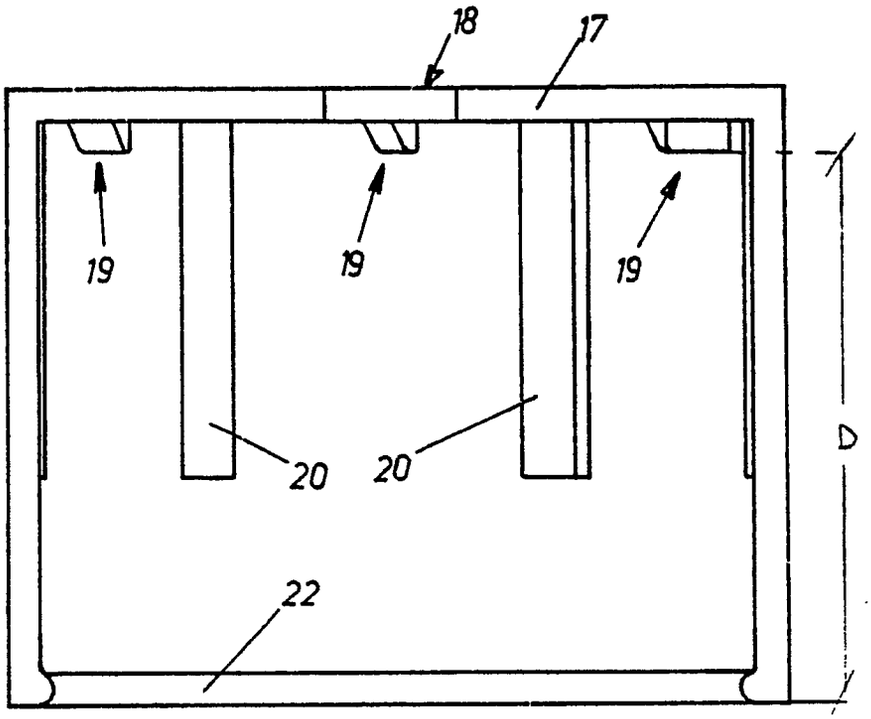

FIG. 3

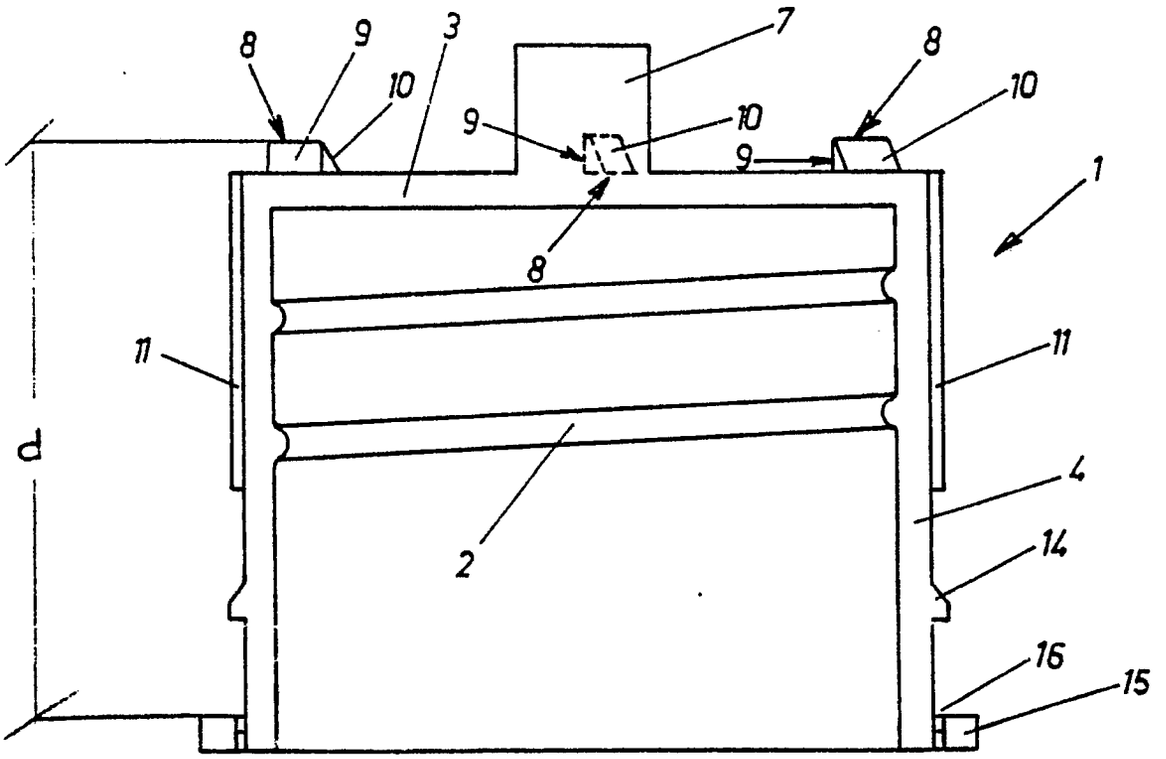

FIG. 1

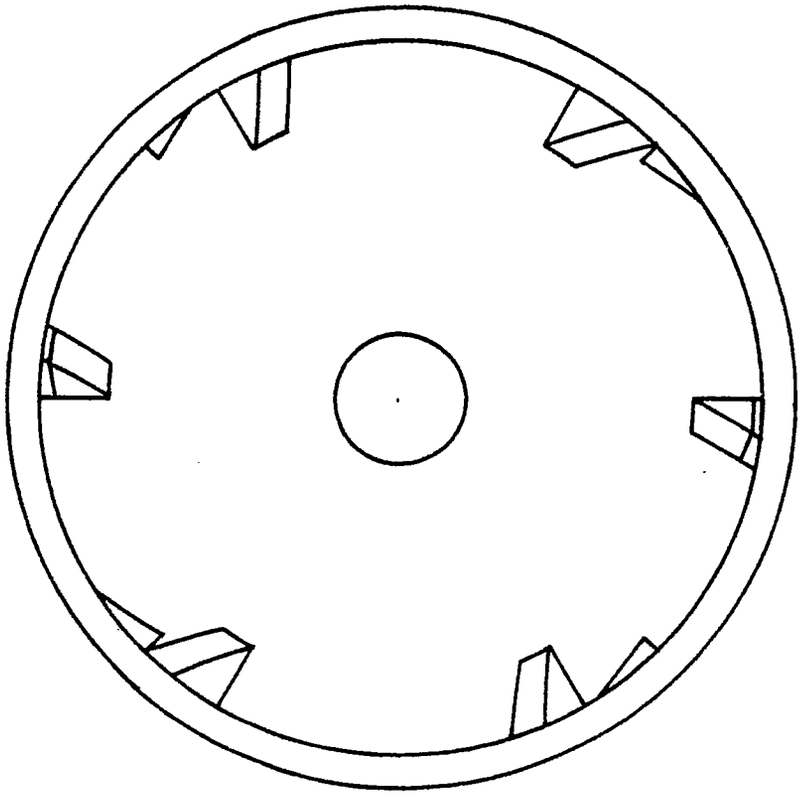

FIG. 4

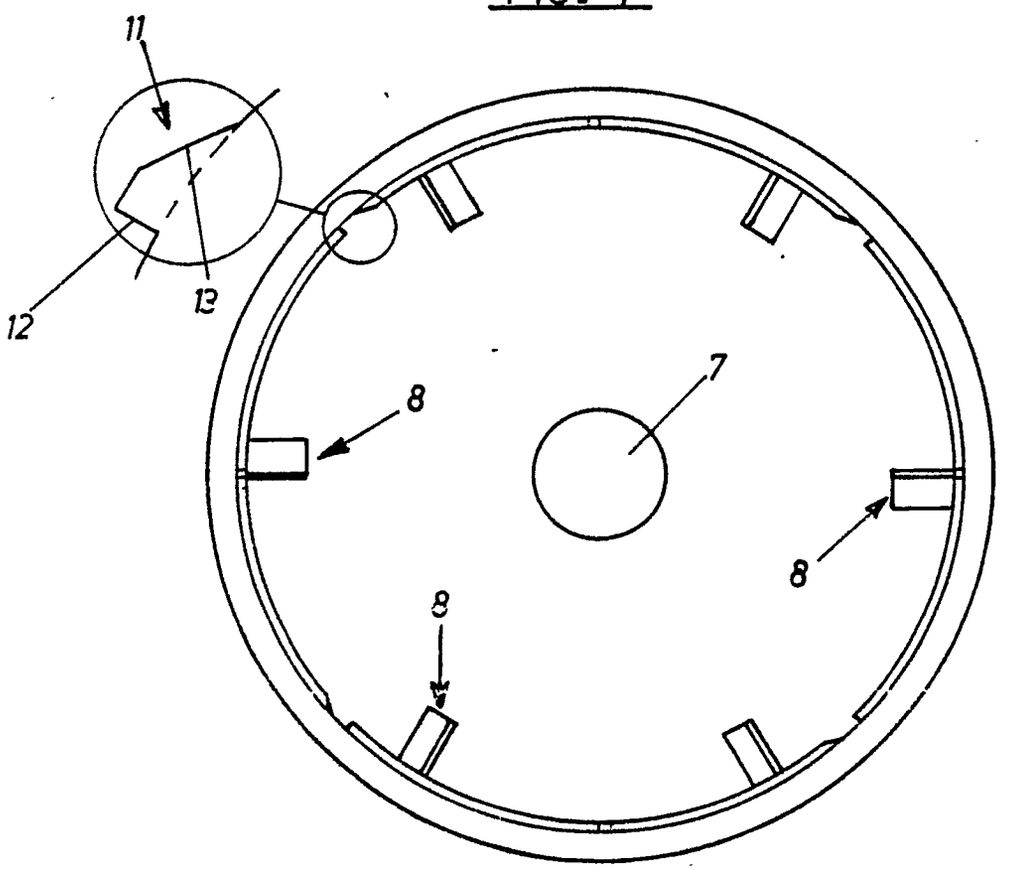

FIG. 2

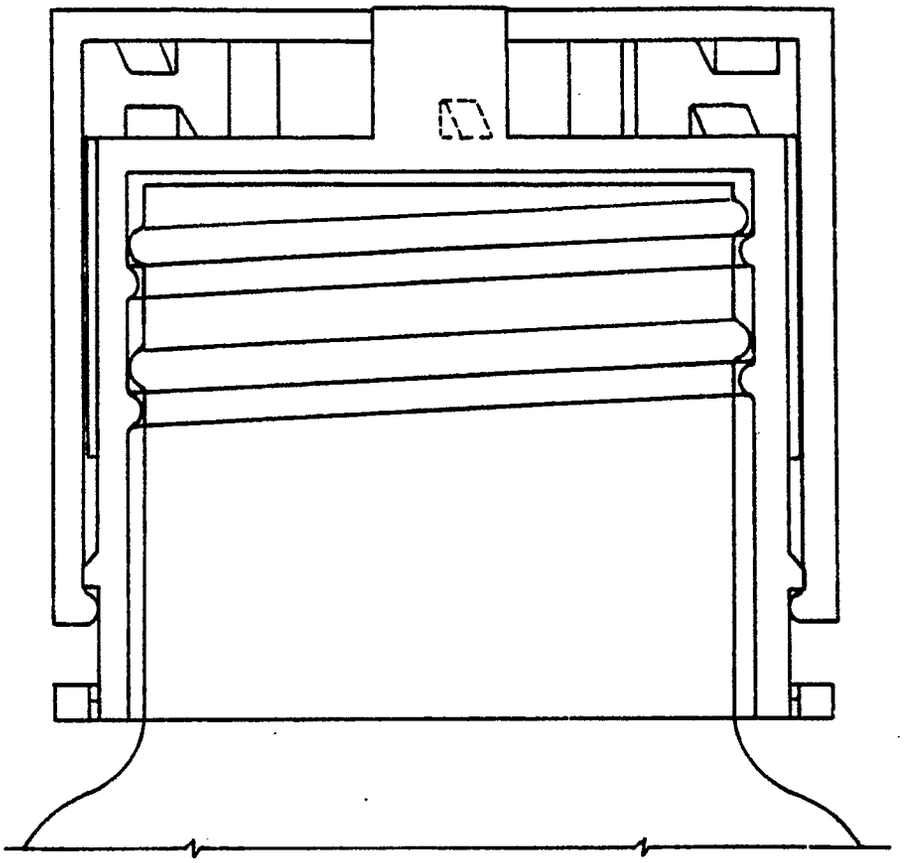

FIG. 5

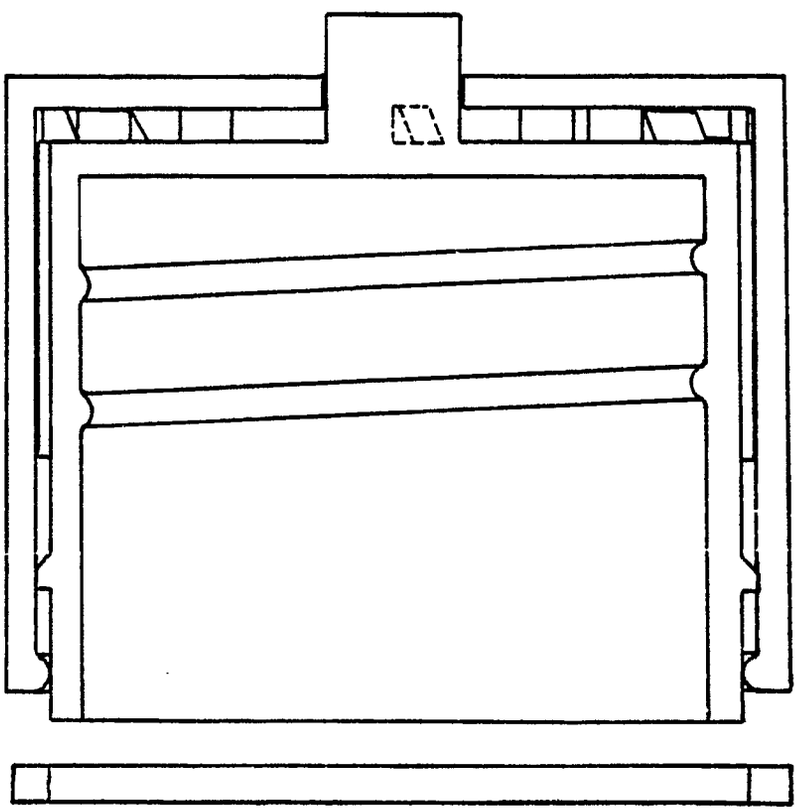

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number

EP 90 10 4415

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 090 143 (ZELLER-PLASTIK KOEHN, GRÄBNER & CO.) * Page 4, last paragraph; figures *	1,5	B 65 D 55/02
Y		2,3	
Y	EP-A-0 182 519 (SPENCER KING PRECISION ENGINEERS LTD) * Page 8, lines 10-30; figures 6,7 *	2	
P,Y	US-A-4 832 218 (GIBILISCO) * Column 5, lines 28-34; figure 6 *	3	
X	GB-A-2 205 821 (MASSMOULD LTD) * Figures 1,3 *	1,5	
A	US-A-4 527 701 (SCHAUBECK) * Figure 1 *	4	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13-07-1990	MARTINEZ NAVARRO A.

CATEGORY OF CITED DOCUMENTS

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