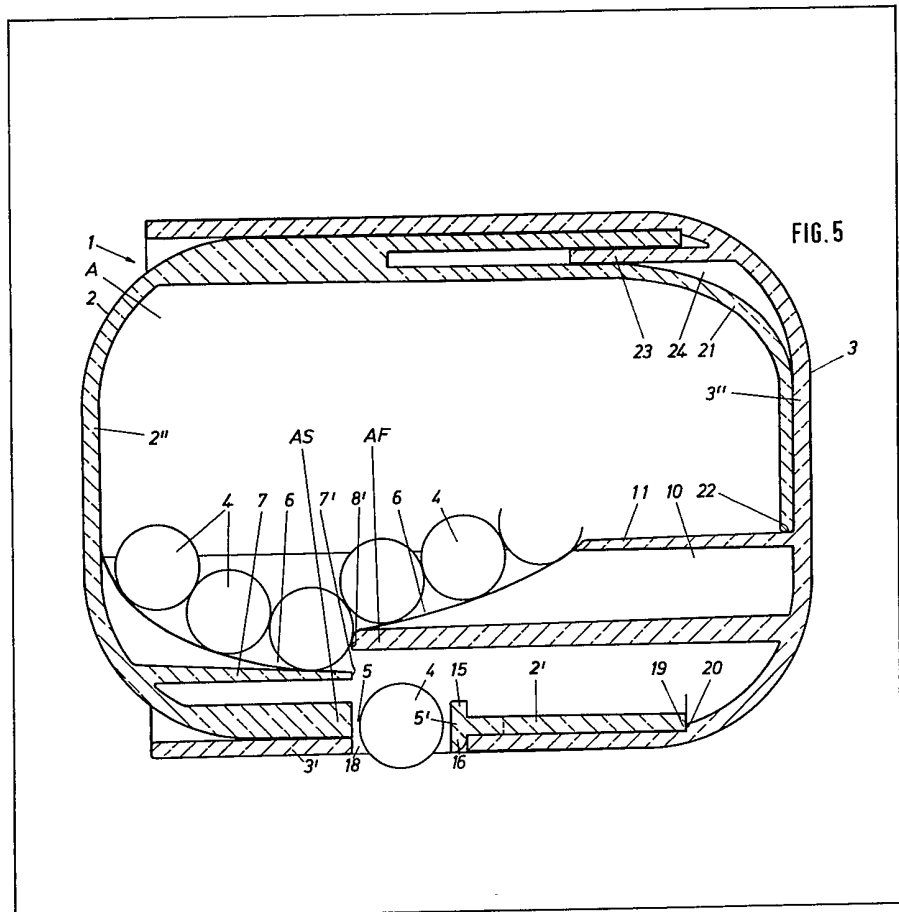


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(54) **Dispensing containers**

(57) A container comprises two telescopic housing parts (2,3) which are urged to an extended position by an integral leaf spring (21). In this position one article (4) falls into a discharge chamber (5), the outlet of which is closed by a wall of the part (3). When the two housing parts are squeezed together, the outlet from the discharge chamber is aligned with an aperture (18) in the wall to dispense the article. Simultaneously, a partition (8) closes the interior of the container from the discharge chamber (5) to prevent more than the one article from being dispensed. In another embodiment, the spring is formed by a separate member clipped to one part, which also has a opening therein to facilitate filling.



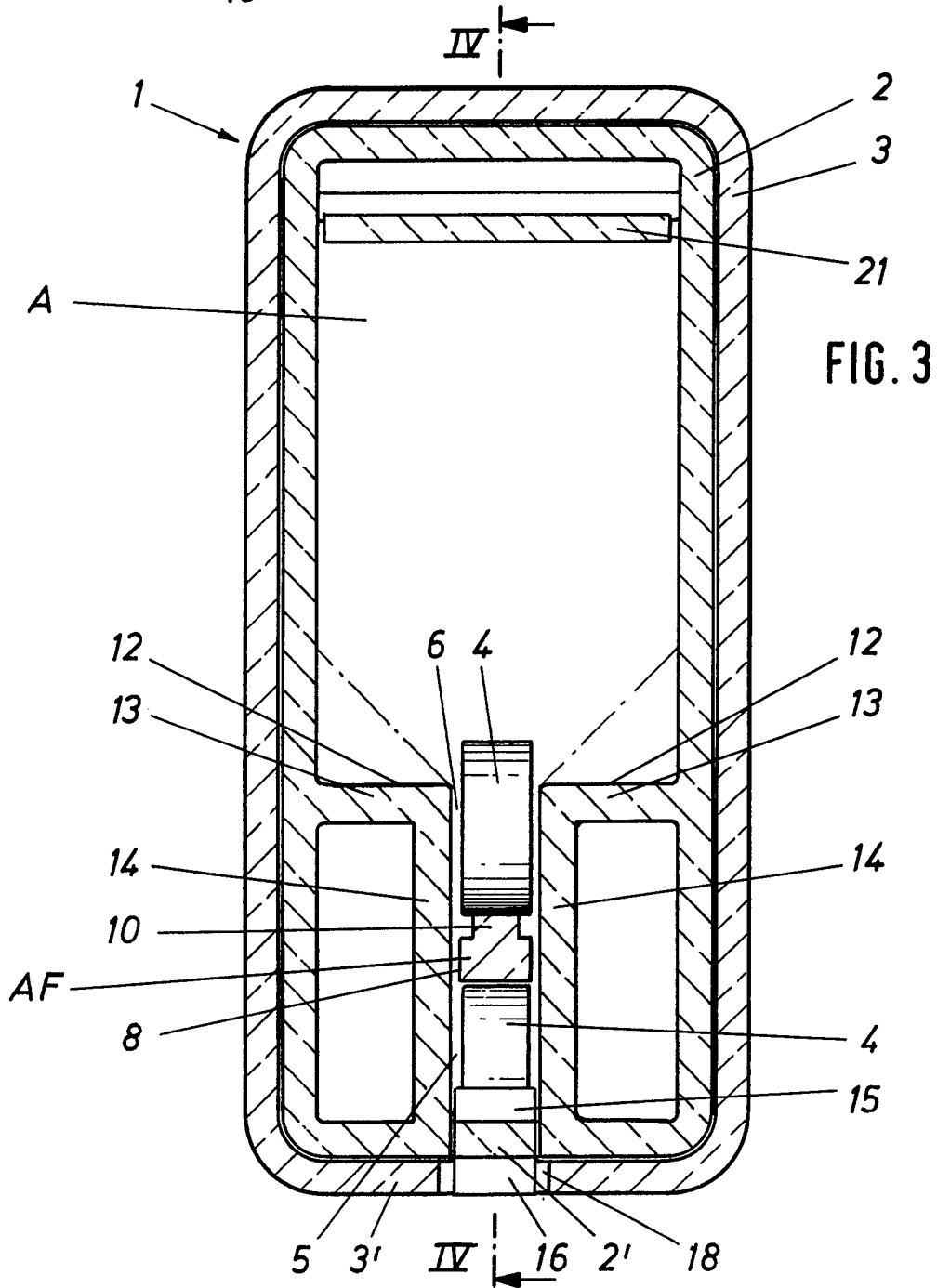
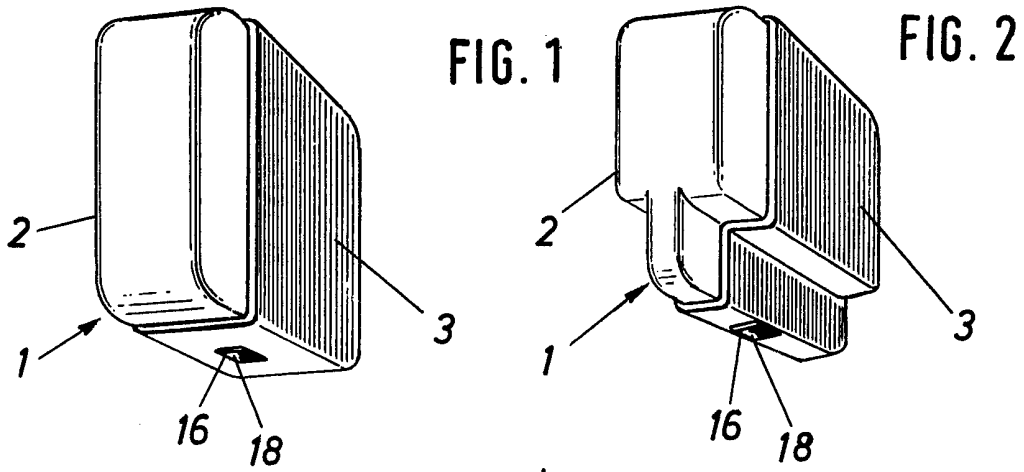


FIG. 4

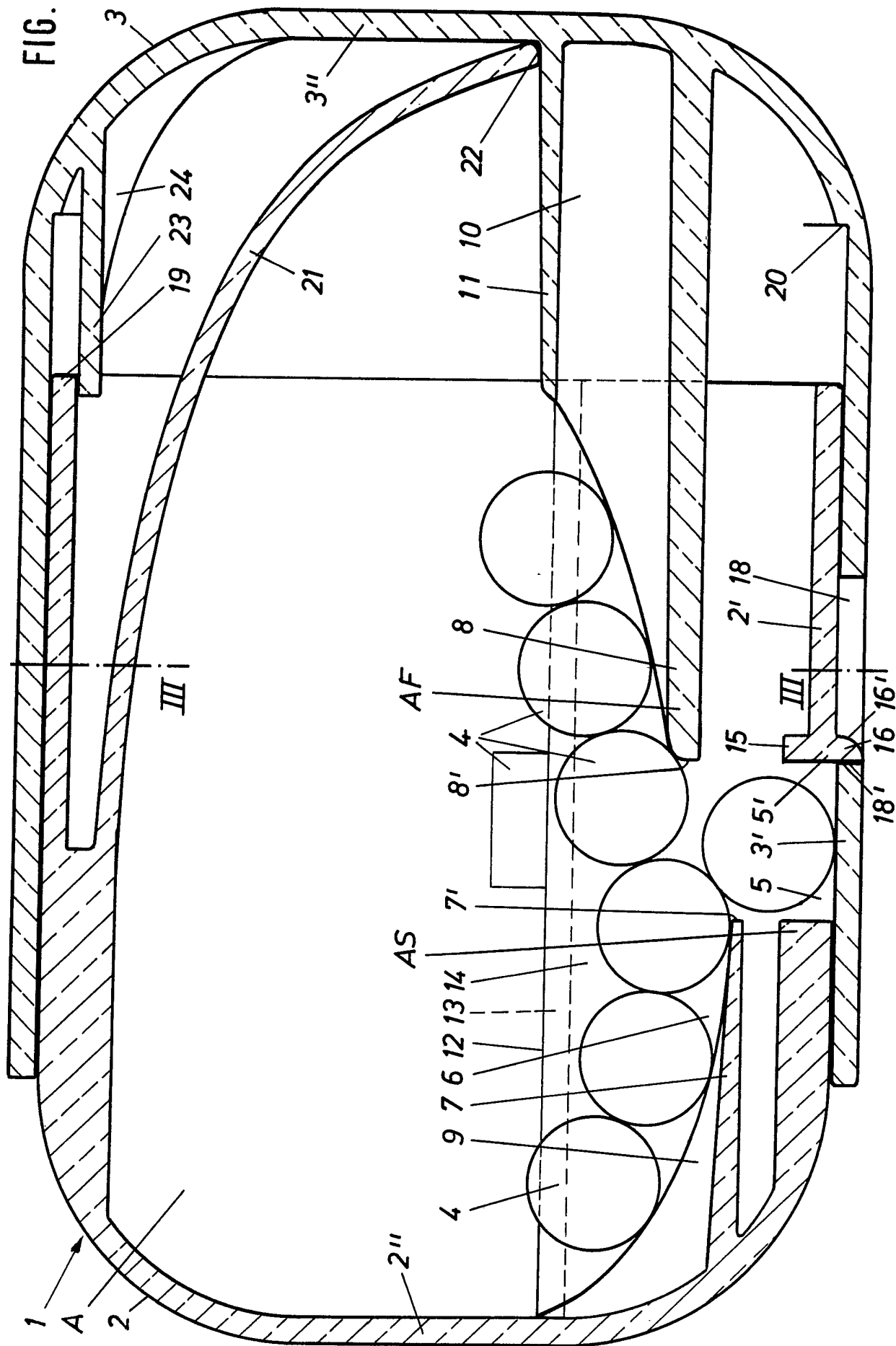


FIG. 5

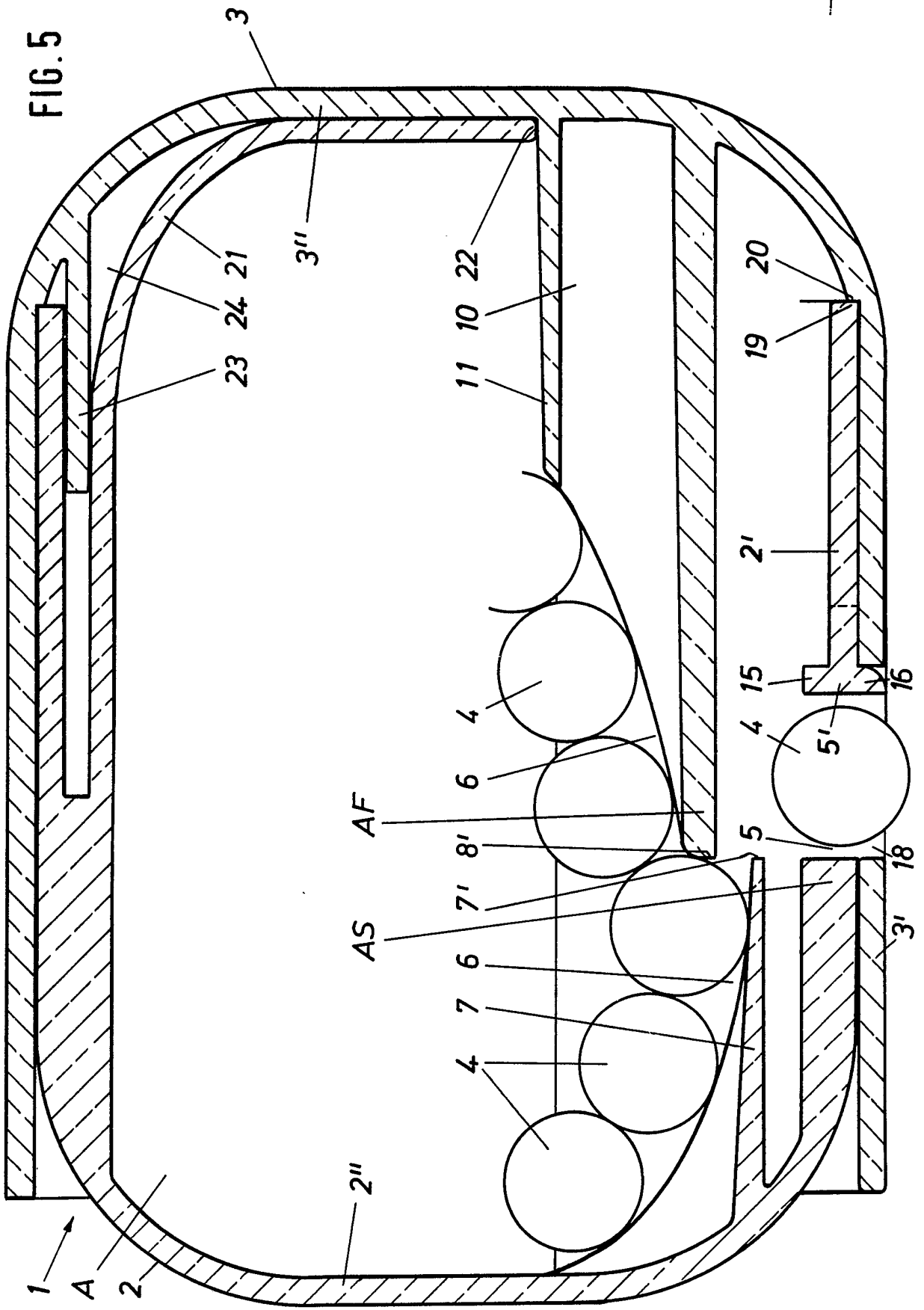


FIG. 6

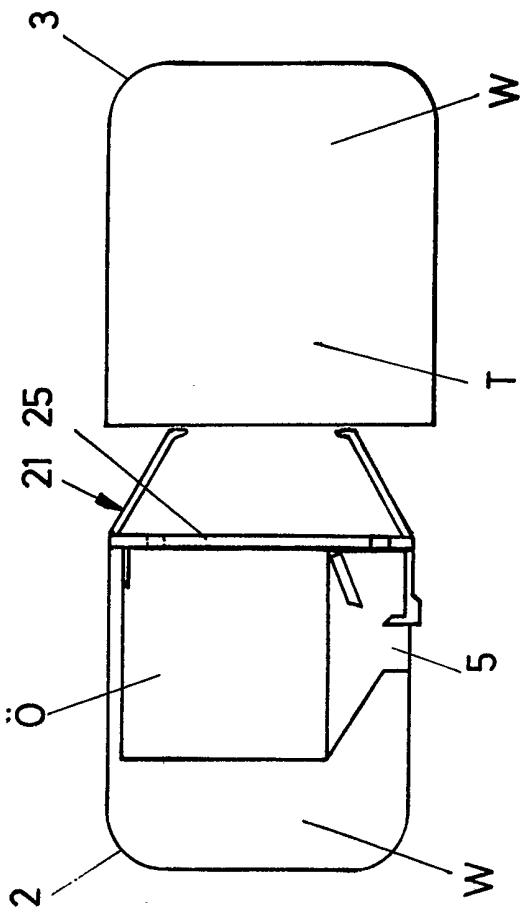


FIG. 7

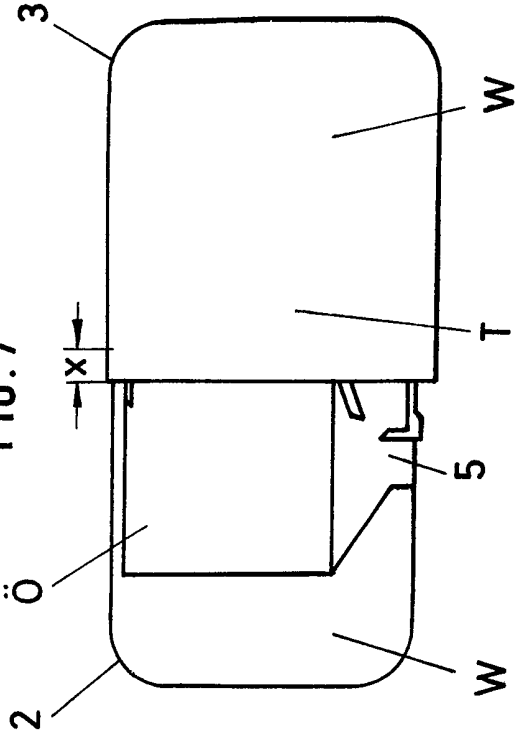


FIG. 8

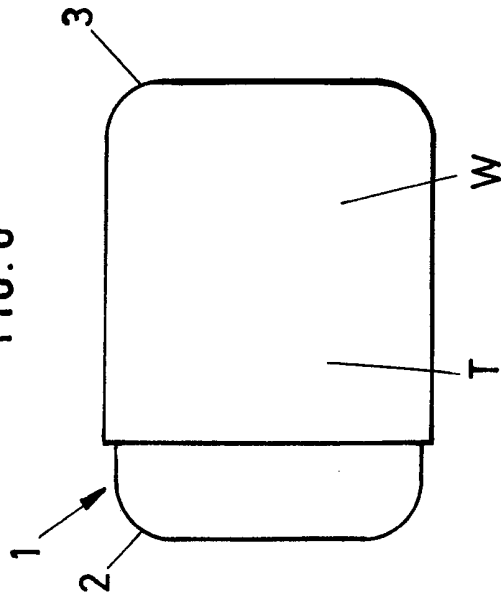
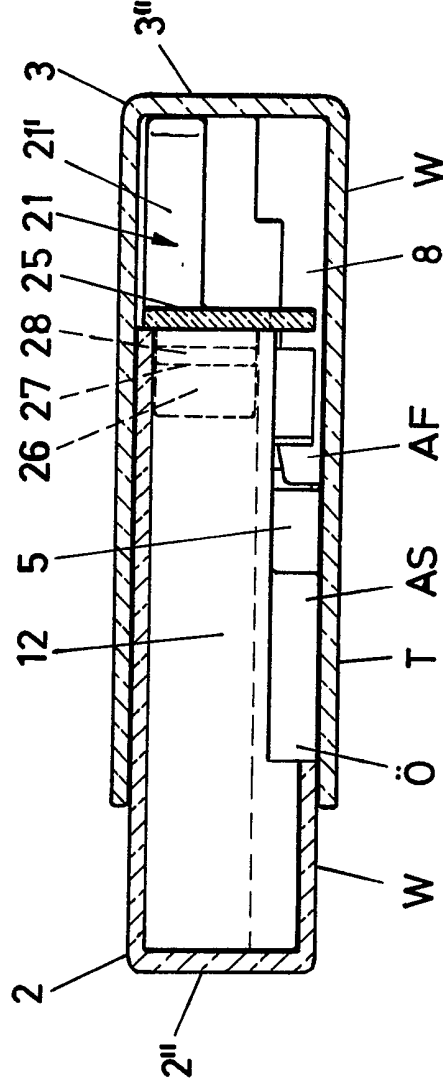


FIG. 12



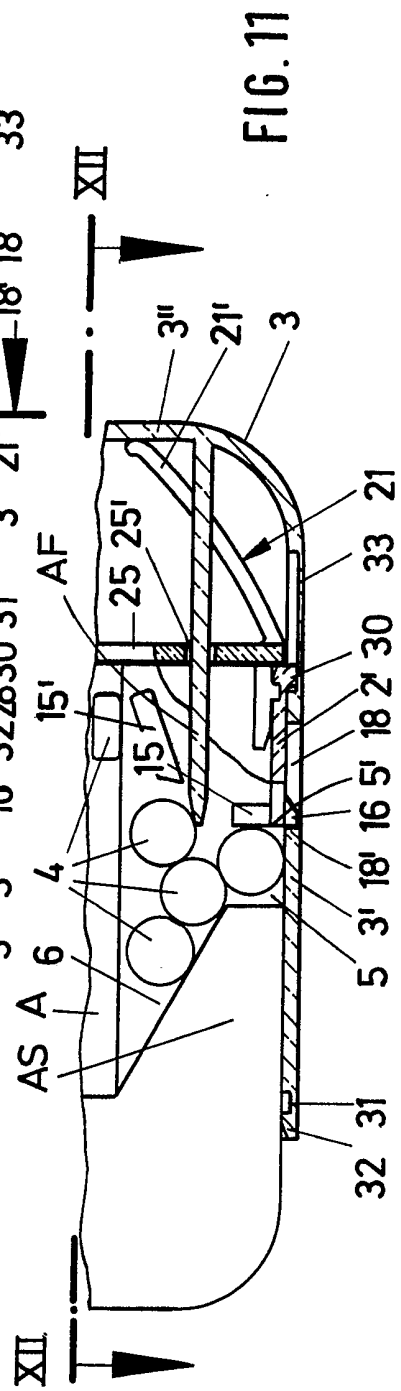
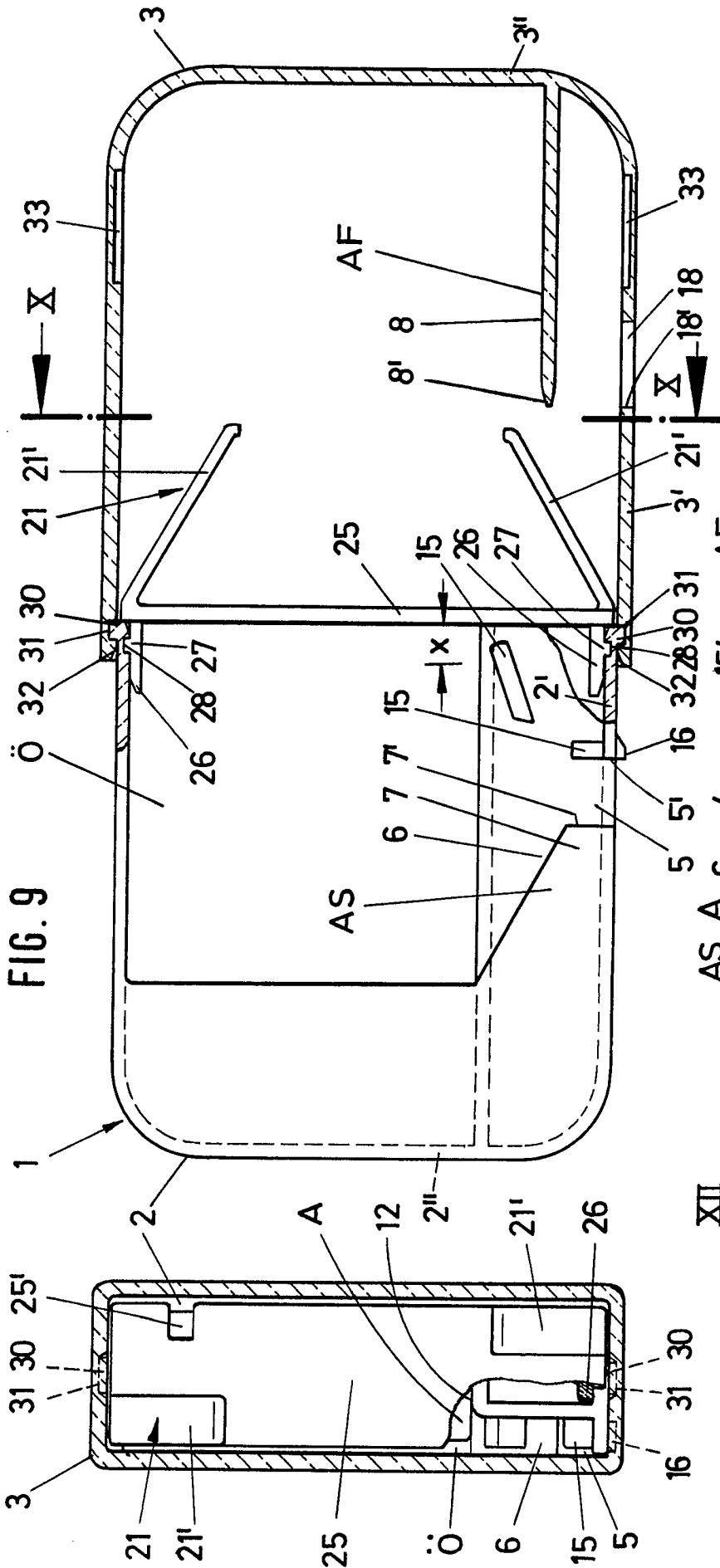


FIG. 10

FIG. 11

SPECIFICATION

Dispensing container

5 The invention relates to a container for storing and dispensing singly articles such as pills and tablets, the container comprising a sorting chute leading into a discharge chamber and a discharge opening through which an article can be dispensed from the discharge chamber as a result of a sliding movement against spring action. Such a container is hereinafter referred to as of the kind described.

A container of this kind is known in the form of a bowl, the bottom of which continues downwards into a sorting-chute in the shape of a trough. This terminates in a discharge chamber in the form of a slide which is supported so as to slide transversely, and which receives the article to be dispensed and, by a sliding movement, carries it into the region of the discharge opening. The remaining contents are simultaneously blocked by the slide. A pushbutton supported in the foot of the bowl serves as an actuator and is adapted to the contour of the foot of the bowl which exhibits a corresponding window.

25 The foot itself is designed without a bottom up to the guide channel for the slide so that there exists a relatively sharp edge to the bowl. The part of the bowl forming the dispensing mechanism takes up about half the total volume. Dispensers of this kind therefore cannot be used, for example, as so-called "pocket packs" which can be carried in the pocket. Furthermore a lid for the bowl can easily come loose.

The object of the invention is to provide a container of the kind described, which, compared to the above prior art, is simpler to produce, more reliable in use and also more favourable to handle, for example in such a way that it can even be carried as a pocket pack.

According to the invention this may be achieved by a container of the kind described which is characterised by two housing parts which complement one another to form the container and the sorting chute, one of the housing parts providing the discharge chamber beneath the sorting chute, and the other housing part providing a wall section in which the discharge opening is formed and a partition member, the two housing parts being slideable telescopically together to bring the discharge opening into alignment with the discharge chamber and to bring the partition member into a position in which it effectively closes the sorting chute from the discharge chamber.

A container, such as a so-called pill dispenser, of this construction has especially increased utility and may consist simply of two housing caps which are plugged telescopically into one another and can slide relative to one another. A special lid as a further component can be completely omitted. Correspondingly there is also no risk of any lid coming loose in carrying the container, particularly if carried in the pocket.

The two housing parts together forming the sorting chute and at the lowest point the discharge chamber is normally closed, as a result of the spring action between the housing parts, by a section of

wall of the other housing part. It is only the further squeezing together of the two housing parts which leads to congruent alignment of the discharge chamber which is holding a pill in the position of readiness for issue, and the discharge opening. The other housing part has a partition member, such as a finger which separates the sorted-out residual stock by closing off the gate lying at the lowest point of the sorting chute. A single delivery is thus effected with great reliability and extremely gently with respect to the body of the pill.

In one example, opposite the partition finger, the one housing part is provided with an ejector finger projecting in the opposite direction, the arrangement being such that when two housing parts are pushed together to open the discharge chamber, the two fingers overlies one another. Such fingers can easily be produced in the form of spikelike projections by injection moulding. Since they are rooted in the bottom of the respective housing part, they confer there at the same time a stiffening. The parts may thus be made with an extremely small cross-section of wall.

The two housing parts may normally be prevented from being separated by means of a disengageable detent which is provided on one edge of the discharge chamber and abuts an edge of the wall section, and which has a bevelled rear face to facilitate riding over the wall section upon assembly of the two housing parts. Upon assembly, the two housing parts may then merely be plugged into one another whereupon they are automatically coupled. The detent may then project into the discharge opening. In order to refill the container the detent merely needs to be pressed in slightly and the housing parts returned. The part carrying the detent may be if necessary made more flexible by slits.

The resilience of the material employed, for example plastics material, can be used in a favourable way for the provision of the spring action. Thus the spring action may be provided by a curved leaf-spring moulded integrally with one narrow wall of a first of the two housing parts and bears against an end of a second of the two housing parts, the leaf spring having a width substantially as great as the interior width of the container. When the spring is carried by the one housing part, the end of the spring may engage in the corner space above the partition finger and the end of the other housing part. As the width of the leaf spring corresponds to the interior width of the receptacle, pills cannot get behind the spring.

Automatic vertical filling of the container is difficult, particularly in the case of small pocket packs with a narrow base. These have too little cross-section for a reasonably sized filling opening. The disciplining of the housing parts, which are relatively small and light in respect of weight, on a conveyor belt is extremely difficult. In order, whilst preserving the functionally advantageous design of the new container, to improve in particular the prerequisites for automatic filling, a sidewall of a first one of the housing parts may be provided with a filling opening which is exposed when the two housing parts are partly telescopically assembled, the filling opening

being closed by a side wall part of the second one of the housing parts when the housing parts are fully telescopically assembled. The automatic filling of the receptacle is now quicker and above all more economically possible. It is now no longer necessary to fit the one housing part only after the filling of the other housing part. Above all it no longer needs to be filled through a narrow wall of the container. On the contrary the structural unit may be preassembled completely. It is larger in size than one housing part and consequently easier to guide, hold and manage. The filling opening may be completely exposed but gets covered again completely by the other housing part upon complete telescopic assembly. Sufficiently large overlapping guide sections will usually exist between the two housing parts to provide adequate stability during the preassembly filling stage. To that extent, no further outlay in material is necessary to provide a filling opening and material is even saved by the opening.

The prelocation of the two housing parts may be achieved by means of catch projections positioned at the open end of a first one of the two housing parts and cooperating with complementary parts at the open end of the second one of the two housing parts; the catch projections running freely in grooves in the second one of the two housing parts when the two housing parts are fully telescopically assembled. The appropriate grooves can easily be produced in a moulding operation.

In order to keep out of action during the filling process, the spring which loads the parts to the closed position, in one construction, when the two housing parts are partly telescopically assembled, spring legs of a leaf spring extending from the open end of the telescopically inner one of the two housing parts are spaced from the closed end of the telescopically outer one of the two housing parts. Thus, the spring comes into the position of readiness for action only when the container is brought into its normally fully assembled position ready for service.

The two spring legs may lie in offset planes and extend at an acute angle to one another from a mounting strip which is snap fitted onto the open end of the inner one of the two housing parts. Before bringing about the explained prelocation the leaf spring may conveniently be associated with the one housing part if it is not anyway an integral component of the one housing part, that is, has already been moulded together with it. Otherwise the spring body may be made in such a way that the mounting strip extends across substantially the whole area of the open end of the respective housing part and has at least one opening for the partition finger to pass through. The mounting strip is thereby at the same time a wall of the housing part by this means the contents cannot get into the other housing part and final assembly is facilitated.

Two examples of containers constructed in accordance with the invention are illustrated in the accompanying drawings, in which:-

Figure 1 is a perspective view from below of a container in the shape of a box for use as a pocket pack;

Figure 2 is a modification corresponding to *Figure*

1;

Figure 3 is a section on the line III-III in *Figure 4*;
Figure 4 is a section on the line IV-IV in *Figure 3*, in the closed position;

Figure 5 is a section corresponding to *Figure 4* but showing the two housing parts pushed together for dispensing;

Figure 6 is a diagrammatic plan of a second example before the plugging of the housing parts into one another;

Figure 7 corresponds to *Figure 6* but shows the parts in the prelocation position exposing a window-shaped opening;

Figure 8 corresponds to *Figures 6* and *7* but shows the container fully assembled;

Figure 9 corresponds to *Figure 7* but is sectioned and on an enlarged scale;

Figure 10 is a section on the line X-X in *Figure 9*;

Figure 11 is a partial section as in *Figure 9* but with the container fully assembled; and,

Figure 12 is a section on the line XII-XII in *Figure 11*.

A container 1 designed in the shape of a compact flat pocket pack consists in the case of both examples, of two housing parts in the shape of caps 2, 3 plugged into one another, and complementing one another to form an interior A closed on all sides, which receives the filling such as pills 4.

The two housing caps 2, 3 can be slid telescopically into one another against spring loading limited by a stop, out of their normal closed position (*Figures 4* and *11*).

The one housing cap 2 forms in its lower section of wall 2' a discharge chamber 5 which in the closed position of the container 1 is closed by a section 3' of wall of the other housing cap 3 extending below it.

The two housing caps 2, 3 form together above the discharge chamber 5 a funnel-like sorting chute 6. Webs 7, 8 project freely from the cap bottoms 2'' or 3'' respectively of the housing caps 2, 3. In the normal position ready for use these webs terminate with their front ends 7' and 8' respectively at a distance apart which corresponds with the length of the discharge chamber 5, that is, only to let one pill 4 through. The webs 7 and 8 respectively run essentially horizontally. They may for reasons of injection moulding technique converge slightly towards their free ends. In the case of the first example an upwardly directed fillet 9 and 10 respectively, rooted in the bottom 2'' and 3'' respectively of the housing caps 2, 3 extends in each case from the back of the web and stiffens the respective region of the bottom. The crest of the fillet is designed on an arcuate or flat slope to correspond with the desired concave trough shape of the bottom of the sorting chute in the direction of the discharge chamber 5. The fillet 9 terminates above in a further web 11. At the level of the web the sorting chute 6 forms on both sides a shoulder 12 running horizontally. These shoulders may instead of as shown in *Figure 3* in solid line also be tilted to form a transverse funnel favouring the sliding down of the pills 4 into the sorting chute 6. The crosswalls 13 forming the shoulders 12 stiffen the inner housing cap 2. They continue into vertical walls 14 bounding the sorting chute 6 at the sides

and rooting in the section 2' of wall at that point.

In the case of the second example there is also a fillet 15' above the web 8, pointing obliquely downwards in the direction of the discharge chamber 5.

5 The sorting chute 6 continues in the lower third of this cap into the horizontal shoulder 12 reaching as far as the front edge of the cap. Its longitudinal edge on the inside of the sorting chute is rounded so that the pills 4 resting there can slide off the shoulder 12 onto the bottom of the sorting chute 6 (Figure 9).

10 In the case of both examples the web 8 forms a partition finger AF running horizontally and the web 7 likewise running horizontally, but at an offset level, forms an ejector finger AS. The height of the ejector finger AS takes into consideration the diameter of the pill 4. The other side of the discharge chamber 5 is bounded by a fillet 15 of about the same height, which continues beyond an opening into the fillet 15' (Figure 11).

20 In the region of its edge 5' the section 2' of wall at that point forms an outwardly directed nose 16. The latter is bevelled on its rear face like a latch. This construction facilitates plug-in assembly of the two housing caps 2, 3 by the rear face forming in practice a leading bevel for the inner corner of the front edge of the other housing cap 3. The detent 16 in that case runs over the inner face of the corresponding section 3' of wall of the housing cap 3 until, through the restoring force of the material, it finally snaps behind the edge 18' of an opening in the housing cap 3, forming the discharge opening 18.

The discharge opening 18 is of such a length that upon sliding the two housing caps 2, 3 into one another telescopically an opening is left of such a size that the pill carried along by the ejector finger AS gets through the discharge opening 18 to the outside without jamming.

The corresponding displacement is effected against the action of a leaf spring 21. The latter is in the first example moulded with the narrow top wall of the housing cap 2. It is a thin-walled flap projecting beyond the front open end face 19 of this housing cap 2. In the unmounted state the flap adopts an extended position approximately in parallel with the narrow top wall. In the assembled state the leaf spring 21 adopts an arched position, bearing by its end 22 in the corner between the web 11 and the closed inner bottom end 3" of the housing cap 3. Its width corresponds essentially with the width inside the interior A of the container. It thereby keeps free of fill the space at the rear of the spring necessary for the springing.

As may be seen from Figures 4 and 5 the container has at least one guide section 23 where one cap slides over the other. Such a weblike guide section 23 supporting the wall of the cap 2 also from the inside, and running in parallel with the webs 8 and 11 likewise practically from the bottom end 3" of the housing cap 3, is furthermore stabilized on the inside by a fillet 24. This fillet has a contour which corresponds essentially with the arching of the spring and forms a stiffening for the guide section 23 which otherwise projects freely. In the position of the housing caps 2, 3 telescoped together the leaf spring 65 21 clings to this contour of the fillet 24 (cf. Figure 5).

The leaf spring extends from a zone of the housing cap 2, having a thickened wall.

70 The bottom end 2" of the housing cap 2, as also that of the housing cap 3, continues via large radii of curvature into the sections 2' and 3' respectively of wall as also into the sidewalls.

75 Instead of the design of an accentuated box shape as may be seen in Figure 1, the container may also be shaped in the way which can be seen from Figure 2, where the section of housing forming the discharge opening 18 is made of an accentuated keel shape.

The pressure faces of the housing caps 2, 3 may be made easy to handle by grooving.

80 In the case of the second example shown in Figures 6 to 12, the leaf spring 21 is formed as a separate plug-in component. It has two spring legs 21' which converge, i.e., extend at an acute angle to one another. The spring legs are rooted in a common mounting strip 25. Catch tongues 26 are moulded onto the latter. The catch tongues 26 carry on the outside each a catch projection 27 which snaps into a corresponding catch recess 28 on the inside in the region of the open end of the inner housing cap. The mounting strip is of such a length that it overlaps the front edge of the housing cap 2, which forms an end stop for the plugging-in (cf. Figure 10), that is, it closes the end face at that point like a lid. Thus no filling can get into the housing cap 95 3 forming the spring chamber. The mounting strip 25 merely leaves in the region of the partition finger AF an opening 25' complementary to the shape of the finger where it passes through. This opening is provided once again offset to the side so that the component can be mounted optionally.

100 The spring legs 21' are arranged on the mounting strip 25 in offset planes in such a way that they can even come into an overlapping position, cross like scissors, whereby a yielding spring action free of snagging is available.

105 The filling of the container 1 is effected from the wide side. For this purpose a window-shaped opening O is left in the one housing cap 2. This opening O lies in one of the two sidewalls W of the receptacle 1 of relatively large area and is almost completely exposed when the two housing caps 2, 3 are partly plugged together. In the normal position ready for service in accordance with Figures 6 this window-shaped opening O is on the contrary closed by a region T of the corresponding sidewall W of the other housing cap 3. As the drawing makes clear, the window-shaped opening O is provided in the inner one (2) of the two housing caps 2, 3.

120 The position of readiness for filling is secured by a catch. In this position the housing caps 2, 3 engage in one another by only a short distance of overlap x of a few millimeters. In the region of the edge of the one housing cap 2 outwardly directed catch projections 30 are moulded onto the narrow wall sections. 125 These engage in catch recesses 31 lying congruently in the corresponding wall section 3' of the other housing cap 3. The front edge of this housing cap is widened slightly like a funnel, so that there are available for the catch projections 30 leading ramps 130 32 which facilitate the assembly. The fact that the

window-shaped opening O extends from the front edge of the housing cap 2 also assists the plug-in assembly.

In the fully assembled position ready for use the catch projections 30 on the one housing cap 2 run freely in grooves 33 in the other housing cap 3.

The catch recess 30 and the detent 16 as may be seen from Figure 10 lie in offset planes, that is, laterally side-by-side so that no interference arises, i.e., the detent 16 at final assembly does not also snap into the catch recess 30.

The leaf spring 21 which has to be associated with the one housing cap 2 before the plug-in assembly, in the pre-location position (Figure 9) exerts no spring force in as much as in the position corresponding with the window being open the spring legs 21' extending from the front edge of the one housing cap lie at a distance from the bottom 3" of the other housing cap, forming the springy abutment.

The sidewall of the housing cap 2 next to the sorting section is cut back to form thereby a pill shaft (cf. Figure 10). Because of the opening O, the partial area T of the sidewall W of the outer housing cap 3 occurs as a shaft wall which is movable. By this means the material for discharge dropping in the region of the sorting chute 6 is held loose and free and jamming.

By pulling the housing caps 2, 3 apart as far as pre-location (Figure 7) the container can be conveniently topped up or refilled.

CLAIMS

1. A container for storing and dispensing singly articles such as pills and tablets, the container comprising a sorting chute leading into a discharge chamber and a discharge opening through which an article can be dispensed from the discharge chamber as a result of a sliding movement against spring action, characterised by two housing parts which complement one another to form the container and the sorting chute, one of the housing parts providing the discharge chamber beneath the sorting chute, and the other housing part providing a wall section in which the discharge opening is formed and a partition member, the two housing parts, being slideable telescopically together bring the discharge opening into alignment with the discharge chamber and to bring the partition member into a position in which it effectively closes the sorting chute from the discharge chamber.

2. A container according to claim 1, in which the partition member is a projecting finger.

3. A container according to claim 2, in which, opposite the partition finger, the one housing part is provided with an ejector finger projecting in the opposite direction, the arrangement being such that when the two housing parts are pushed together to open the discharge chamber, the two fingers overlie one another.

4. A container according to any one of the preceding claims, in which the two housing parts are normally prevented from being separated by means of a disengageable detent which is provided on one edge of the discharge chamber and abuts an edge of

the wall section, and which has a bevelled rear face to facilitate riding over the wall section upon assembly of the two housing parts.

5. A container according to any one of the preceding claims, in which the spring action is provided by a curved leaf-spring moulded integrally with one narrow wall of a first of the two housing parts and bears against an end of a second of the two housing parts, the leaf spring having a width substantially as great as the interior width of the container.

6. A container according to claim 1 or claim 2, in which a side wall of a first one of the housing parts is provided with a filling opening which is exposed when the two housing parts are partly telescopically assembled, the filling opening being closed by a side wall part of the second one of the housing parts when the housing parts are fully telescopically assembled.

7. A container according to claim 6, in which the two housing parts are locatable in their partly telescopically assembled relative position with the filling opening exposed by means of catch projections positioned at the open end of a first one of the two housing parts and cooperating with complementary parts at the open end of the second one of the two housing parts; the catch projections running freely in grooves in the second one of the two housing parts when the two housing parts are fully telescopically assembled.

8. A container according to claim 6 or claim 7, in which, when the two housing parts are partly telescopically assembled, spring legs of a leaf spring extending from the open end of the telescopically inner one of the two housing parts are spaced from the closed end of the telescopically outer one of the two housing parts.

9. A container according to claim 8, in which the two spring legs lie in offset planes and extend at an acute angle to one another from a mounting strip which is snap fitted onto the open end of the inner one of the two housing parts.

10. A container according to claim 9, when dependent at least on claim 2, in which the mounting strip extends across substantially the whole area of the open end of the respective housing part and has at least one opening through which the partition finger passes.

11. A container according to claim 1, substantially as described with reference to any one of the examples illustrated in the accompanying drawings.