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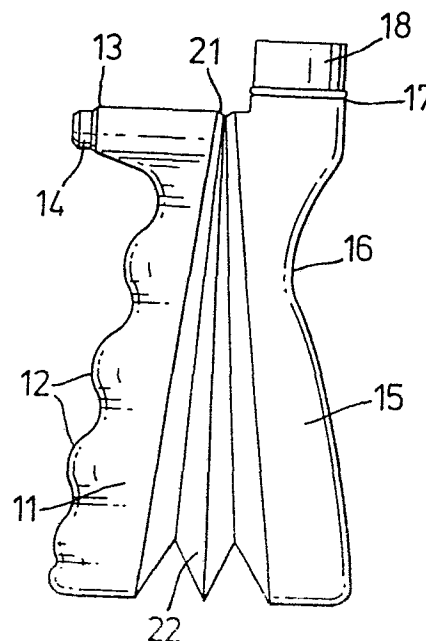
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⑩ **Dispensing container.**

⑩ A dispensing container comprises two main portions (11, 15) which are connected together at a hinge (21). A bellows portion (22) extends between the main portions (11, 15). The main portions (11, 15) and the bellows portion (22) enclose a chamber of which the internal volume can be reduced by bringing the main portions (11, 15) towards each other about the hinge (21), so compressing the bellows portion (22). This operation can be performed by squeezing the container in one hand, for the purpose of discharging the contents through an outlet (14).



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## DISPENSING CONTAINER

A dispensing container comprises a container provided with means for forcing the contents of the container through an outlet. When cost is not a problem, the means may be a pump formed of many  
5 components but the cost of manufacturing and assembling such components cannot be tolerated when a dispensing container of very low unit cost is required.

When a wall of the container is flexible, it is possible to force contents of the container through an outlet by compressing the  
10 container at the flexible wall, for example as is well known in the simple oil can, but only limited compression of the container can be achieved in a single compression. The present invention provides a container with a particular arrangement of flexible wall which enables a greater compression of the container to be  
15 achieved using one hand only in a convenient manner.

Flexible walls for containers have been formed with a bellows shape, but the two halves of the container separated by the bellows are then not stably connected and if one half of the container is held, the other half will flop about due to the  
20 flexibility of the bellows. The present invention therefore provides a container having two main portions hinged together and a bellows portion connecting together said two main portions, the bellows portion being contracted and expanded on relative movement of said two main portions about said hinge.

25 The container is preferably shaped to fit into the palm of a hand, so that one main portion is supported by the thumb whereas the other main portion is supported by the fingers, hinging of the two portions being achieved by squeezing and relaxing of the fingers relative to the thumb. The container is preferably arranged to  
30 have a rest position in which the bellows is expanded and the material of the bellows portion is preferably chosen to be

inherently resilient, so that when the pressure on the two main portions is relaxed, the bellows expand.

The hinged arrangement has a particular advantage in that additional pressure can be applied to the two main portions by 5 applying a given force at increased distances from the hinge axis. A user with a weak grip can therefore force the contents of the container from the outlet by applying a grip at a larger distance from the hinge than a user with a strong grip.

The location of the hinge and bellows portion in relation to the 10 outlet can be chosen to suit the application of the container, and at least one main portion is preferably provided with a smooth panel for the application of a label or an area of print to indicate the nature of the contents. One or both of the main portions may be ribbed to improve the grip and also to improve the 15 rigidity of some of the dispenser walls.

Broadly defined, the invention provides a dispensing container comprising two main portions hinged together and a bellows portion extending from the hinge between the main portions to provide communication between the interiors of the main portions, the 20 container further comprising an outlet, the arrangement being such that on hinging of the two main portions together to compress the bellows portions, some contents of the container are forced through the outlet.

The two main portions may be shaped to provide a grip for the 25 operators hand. A filling inlet may be provided on a main portion separate from the outlet.

The bellows portion preferably comprises two opposite pairs of elements, each pair including an outer component element hinged to an inner component element, the inner component elements stopping 30 short of said hinge and the outer component element of one pair

being hinged to the opposite outer component element of the other pair for a predetermined distance from said hinge, said inner component element terminating at said predetermined distance from the hinge.

5 An example of the invention will now be described as reference to the accompanying drawings in which:

Figure 1 is a side elevation of one embodiment of a container,

Figure 2 is a plan of the container of Figure 1,

10 Figure 3 is an underplan of the container of Figure 1,

Figure 4 is an end elevation of the container of Figure 1,

Figure 5 is a side elevation of the container with the bellows portion contracted, and

15 Figure 6 is an exploded side elevation of an alternative container,

A container as shown in Figures 1 to 5 is blow moulded from plastics material to provide a first main portion 11 formed with 20 ridges 12 for fingers of the operator's hand and an outlet 13.

The outlet 13 may be provided with an adjustable screw nozzle 14 to adjust the dispensing of the contents of the container between a jet and a fine spray.

The second main portion 15 is provided with a depression 16 shaped 25 to receive the flesh of the operator's hand at the junction of the thumb and index finger. The second portion 15 is also provided with a filling aperture 17 closed by a screw cover 18.

The two main portions 11 and 15 are joined together by an integral hinge 21 at their top ends. The hinge allows the two main 30 portions to pivot relative to each other about the hinge axis but

not to move apart at their top ends. Radiating downwards from the hinge 21 are the bellows of a bellows portion 22 integrally moulded with the two main portions 11 and 15. As the two main portions 11 and 15 pivot about the axis of the hinge 21, the bellows portion 22 expands and contracts between the expanded rest position shown in Figure 1 and the contracted position shown in Figure 5.

When the container is held by an operator with his fingers around the first main portion 11 and the ball of his thumb around the second main portion 15, the contents of the container are forced out of the outlet nozzle 13 by the operator squeezing the two main portions together so as to contract the bellows portion 22 from the position shown in Figure 1 to the position shown in Figure 5. When the operator relaxes his grip, the natural resilience of the bellows portion 22 causes the container to move back to its rest position as shown in Figure 1. Air is drawn into the container through the outlet nozzle 14. The process can then be repeated. The contents of the container can be ejected in a spray or a jet according to the adjustment of the nozzle 14. When the container is intended to be used for dispensing a single set of contents, the filling aperture 17 is not needed, the container being filled through the outlet 13 with the nozzle 14 removed, the nozzle 14 then being fixed in position and the container being thrown away when empty. When the container is intended to be reused, the filling aperture 17 and cap 18 are provided to facilitate re-filling of the container.

Figure 6 shows an exploded view of a modified bellows portion 122, in which some of the elements of the bellows stop short of the hinge 21. Since the elements have finite thickness, it becomes difficult to close up the bellows portion completely as shown in Figure 5 of the first embodiment since in the arrangement of Figure 5 there are four thicknesses of material laid one upon the other in the side wall of the container immediately below the

hinge 21. According to the embodiment shown in Figure 6, only the two outer elements 123 of the bellows portion 122 extend to the hinge 121. There are two inner elements 124 which stop short of the hinge 21 by a predetermined distance D. The outer bellows 5 elements 123 have parallel major sides 135 and 136, the outer sides 135 extending from the hinge 121 to the bottom of the container and being hinged to the adjacent main portions 11 and 15. The inner sides 136 are hinged to the outer sides 137 of the inner elements 124; the inner sides 138 of the inner elements are 10 hinged together. When the bellows portion 122 is compressed, the sides 135 and 138 approach each other, while the sides 135 and 137 move furthest into the interior of the container.

Figure 6 is an exploded view, in order to represent a three dimensional bellows portion in two dimensions, and in the three 15 dimensional arrangement, the boundary 131 will be hinged to the boundary 132 and the boundary 133 will be hinged to the boundary 134. The upper end of the outer element 123 is tapered from an apex at the hinge 121 to the full width of the outer element at the predetermined distance D from the hinge. Beyond this 20 predetermined distance from the hinge, the outer elements are not hinged directly together, but through the two inner elements. The two inner portions are tapered starting at the predetermined distance from the hinge until they reach their full width, which is equal to the full width of the outer portions, and the two 25 inner major sides of the inner portions are hinged together from the end of the tapered portion to the bottom of the elements.

With this arrangement, it is only necessary for the hinge to accommodate the thickness of two wall portions, that is the outer elements of the bellows portion, and the inner elements only start 30 the pre-determined distance from the hinge where the bellows portion has the thickness of four elements, so that there is less strain on the hinge 121 when the bellows portion is compressed. It also simplifies the moulding procedure since only three hinge

lines have to be formed at the convergence to the hinge 121 and three hinge lines to the convergence at the predetermined distance from the hinge.

It will be noticed that the major part of the dispensing container 5 is moulded in a single piece, so that no assembly operation is required except in respect of the nozzle 14 and, if provided, the filling cap 18.

Any suitable form of plastics material can be used for moulding the containers. Injection moulding techniques can be used as an 10 alternative to blow moulding. It would be possible for the containers to extend below or above the operator's hand, so that the volume enclosed by the operator's hand does not limit the volume of the container.

The illustrated dispensers are simple embodiments. The fold lines 15 of the bellows portions 22/122 can be curved or be formed in two portions at an angle to one another, to suit the requirements of the user of the container. The hinge can be located at any convenient point in the container. The containers can be used to dispense a measured quantity of contents through the outlet 20 nozzles 14 by compressing the bellows portions 22/122 by a measured amount. In this case, a filling tube should extend from the nozzle 14 to the bottom of the container so that liquid contents rather than air is expelled through the nozzle 14 on compression of the bellows portions 22/122. Such a filling tube 25 may also be useful even when a measured amount of contents is not desired.

CLAIMS

1. A dispensing container comprising two main portions hinged together and a bellows portion extending from the hinge between the main portions to provide communication between the interiors  
5 of the main portions, the container further comprising an outlet, the arrangement being such that on hinging of the two main portions together to compress the bellows portions, some contents of the container are forced through the outlet.
2. A container as claimed in Claim 1, wherein the remote side  
10 of one main portion is ridged to fit an operator's hand.
3. A container as claimed in Claim 1 or Claim 2, wherein the remote side of a main portion is shaped to fit the junction of the thumb and index finger of the operator's hand.
4. A container as claimed in any one of Claims 1 to 3,  
15 comprising a closable filling inlet on one main portion.
5. A container as claimed in any one of Claims 1 to 4, wherein said bellows portion tapers uniformly from a hinge to the opposite end of the container.
6. A container as claimed in any one of Claims 1 to 4, wherein  
20 the bellows portion comprises a number of component elements, adjacent elements being hinged together, the major hinged sides of the elements being parallel.
7. A container as claimed in Claim 6, wherein the bellows  
portion comprises two opposite pairs of elements, each pair  
25 including an outer component element hinged to an inner component element, the inner component elements stopping short of said hinge and the outer component element of one pair being hinged to the opposite outer component element of the other pair for a



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predetermined distance from said hinge, said inner component element terminating at said predetermined distance from the hinge.

8. A container as claimed in Claim 7, wherein said outer component element is tapered over said predetermined distance from said hinge and said inner component element is tapered over a region nearest said hinge.

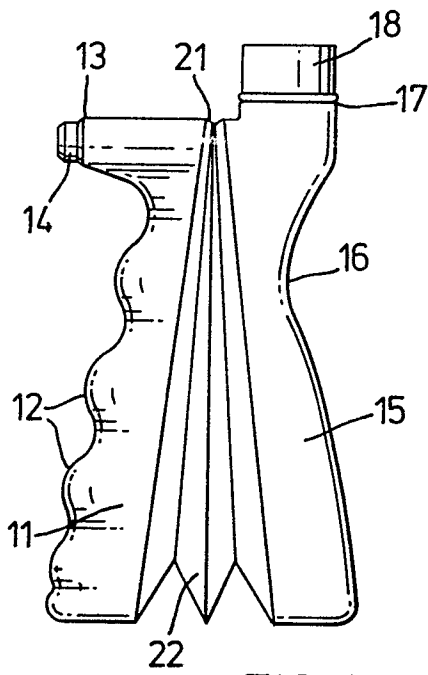


FIG. 1

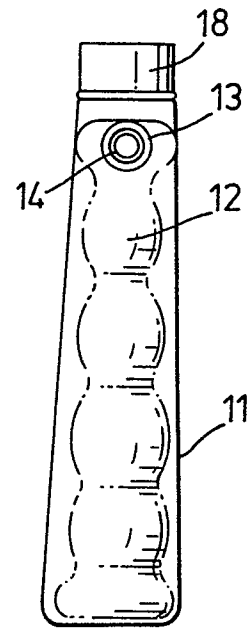


FIG. 4

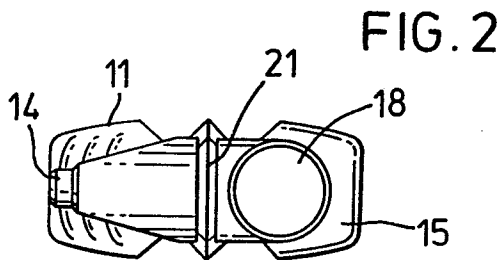


FIG. 2

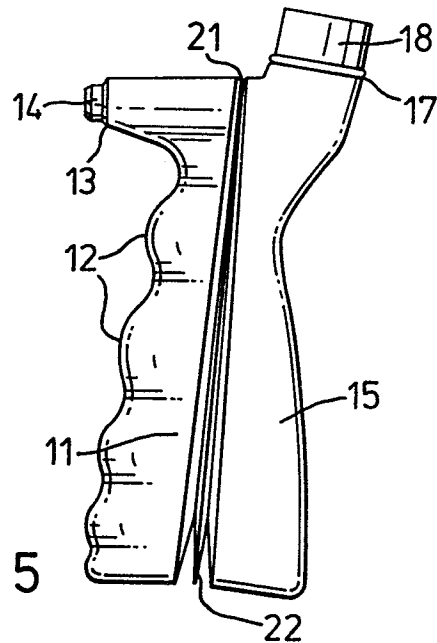
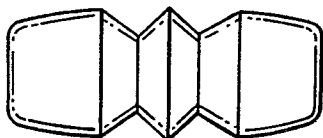


FIG. 5

FIG. 3



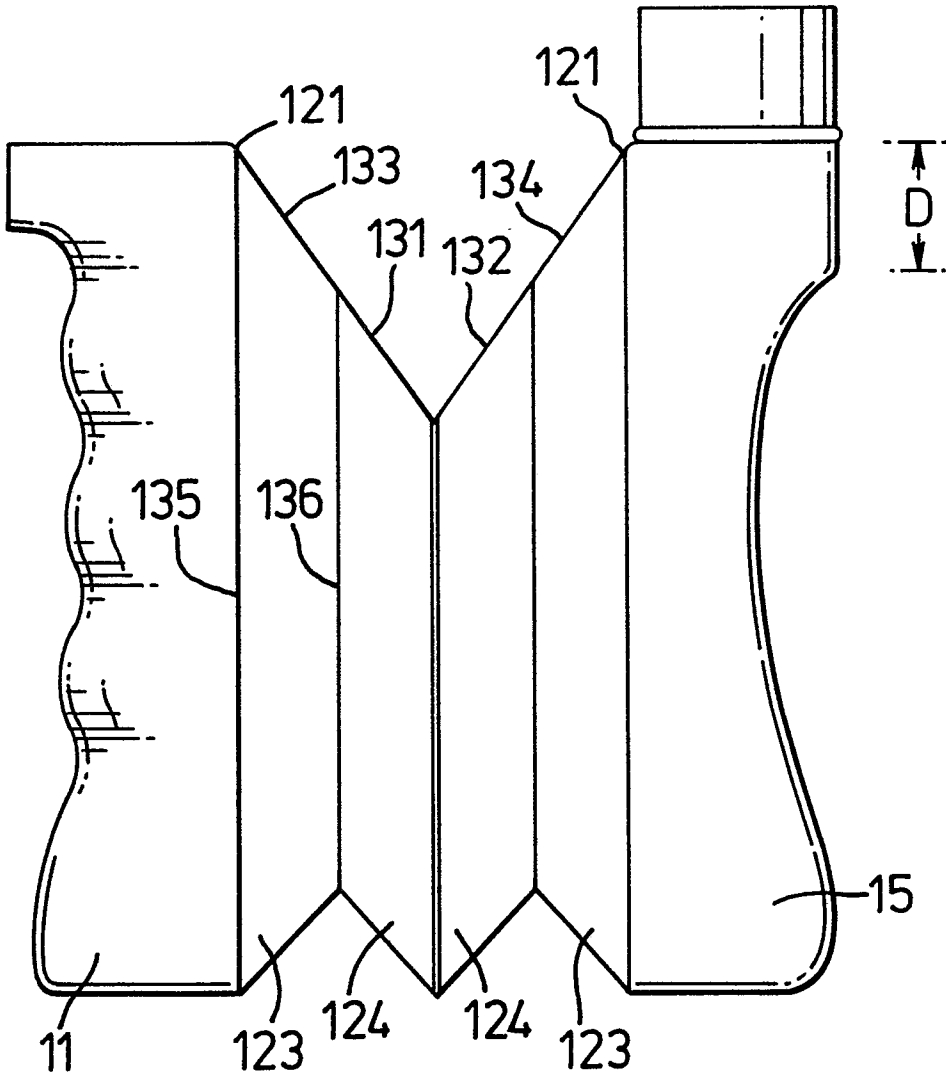


FIG. 6