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(54) Container for dispensing measured quantities of fluent material.

(57) A container for fluent material, particularly for granular solids, comprises a paperboard carton with a volumetric measure (20) forming the means of closure of a dispensing apertur (10) set in the top panel. The volumetric measure preferably made of a plastics material, has a rim portion (25) that seats on the top panel and a body portion (22) that extends through the aperture into the carton. The measure has a minimum volume of 25 ml and has cross sectional and longitudinal dimensions in defined proportions. The measure serves as a reclosable lid and preferably the body portion is adapted to engage the edges of the aperture to maintain the measure in the closed position between uses.

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CONTAINER FOR DISPENSING MEASURED QUANTITIES OF FLUENT MATERIAL

This invention relates to containers and more especially to paperboard cartons intended to dispense fluent material. The invention is applicable to any liquid or solid fluent material but is particularly concerned with the dispensing of granular solids in predetermined quantities.

The provision of small volume measuring devices for use in conjunction with larger containers of fluent material is well known in the packaging art, particularly in the field of detergent products. Liquid cleaning compositions and liquid fabric softening compositions are sold in bottles, the caps for which are dimensioned to serve as liquid measures. Granular detergent compositions, particularly in the larger drum or carry-carton packages, frequently include a measuring cup which is placed in the package after it has been filled with detergent to occupy the 'outage' or headspace between the lid and the surface of the detergent in the package. However this type of random packing arrangement cannot easily be used for smaller sized cartons, such as those easily held in the hand,because of the limited outage in the carton.

German Gebrauchsmuster No. 7428677 proposes a package for a two component detergent composition in which a measuring cup is used to seal the opening in a compartment set into the side of a carry-carton, the compartment serving to hold tablets of an additive product intended for use with the detergent composition. However this package, in common with similar prior proposals, is

expensive in material cost and is difficult to erect and fill on conventional packaging machinery. Furthermore, like the randomly-packed measuring cup, the arrangement disclosed in the Gebrauchamuster is primarily intended to be used for large-sized cartons.

Accordingly the dispensing of granular detergents from small and medium sized cartons tends to be left to the judgement of the consumer, governed by experience and by reference to in-use characteristics of the detergents such as the level of suds produced.

Whilst this is acceptable for fluent products in which visual evidence of in-use product characteristics is readily available, this is not the case with products such as detergent additives that produce little or no visual indication (such as suds level) in use. Where the fluent product is of high density, packaged in relatively small containers with a low volume per use, and where control of usage is desirable for optimum performance, it is unsatisfactory for the user to have to rely solely upon judgement for the measurement of the correct quantity of product.

There is therefore a need for a package adapted for dispensing and measuring fluent material which is of simple structure and which can be used for small and medium sized containers. Furthermore, there is also a need for such a package that can be handled and filled on conventional packaging machinery with relatively minor modifications.

According to the present invention there is provided a container comprising a paperboard carton having side and end panels, and a top and bottom panel formed by overlapping flap portions hingeably attached to opposed side panels, the flap portions forming the top panel being shaped to define a dispensing aperture therein, said aperture being sealed by a reclosable lid, wherein the reclosable lid comprises a detachable volumetric measure formed with a rim portion adapted to engage

the top panel and a hollow body portion depending from the rim portion and extending into the carton interior through the aperture, the cross sectional configuration of the hollow body in the plane of the rim portion being defined with reference both to a first reference direction extending parallel to the lines of hingeable attachment of the flap portions to the side panels, and to a second reference direction perpendicular to the first reference direction in the plane of the rim portion, the ratio of the maximum cross sectional dimensions in the respective directions being in the range from 1:2 to 2:1, the ratio of the larger of said two dimensions to the depth of the body, as measured from the rim, lying in the range from 2:1 to 1:1, the body having a volume of at least 25 ml.

Preferably the hollow body is of frustoconical or frustopyramidal shape and in a highly preferred embodiment has a rectangular cross section.

The container of the present invention comprises a carton having side, end, top and bottom panels made from a paperboard blank, conventional materials and techniques being employed in its formation and erection. Details of the panel configuration do not form part of the present invention except insofar as the top panels of the carton are formed with cut-out portions which together form a dispensing aperture through which the fluent material can be poured. The dispensing aperture can be of any appropriate shape eg. circular, rectangular, trapezoidal, triangular, elliptical etc. but is preferably shaped so as to be in contact, along a substantial part of its periphery, with the outer periphery of the volumetric measure when the latter is in position with the rim portion in contact with the top panel of the carton. The aperture is located at one end of the top panel in order to facilitate the dispensing of the contents and preferably extends to a point closely adjacent an end panel of the carton so as to

enable the carton to be emptied completely. Where the shape of the aperture is such as to make it necessary to space the aperture from the end of the top panel, lines of weakness can be provided between the edge of the aperture and the end of the panel, eg. by scoring or perforation, to permit the panel to be torn to facilitate the complete removal of product.

The volumetric measure comprises a hollow body having a rim, the body being adapted to fit within the aperture in the carton and the rim being dimensioned to extend laterally outwardly of the aperture so as to cover it and seat on the outer surface of the top panel of the carton. The rim need not conform to the shape of the aperture but may have any convenient plan configuration. In a preferred embodiment the rim is releasably attached to the top panel of the carton by frangible bonds using eg. hot melt adhesive spot bonding, adhesive tapes etc. In a further embodiment the volumetric measure is molded from a sheet of material, the peripheral edges of which are adhesively attached to the top panel of the carton, the volumetric measure being unattached to the sheet otherwise than by a number of frangible links disposed around the periphery of the rim portion. The hollow body portion of the volumetric measure is dimensioned such that it satisfies the constraints of a minimum volume of 25 ml and a shape such that a predetermined volume can be measured easily by the user. The volume of the measure generally lies in the range 25-300 ml and is of course dependent on the nature of the product as well as on the density of the fluent material. For granular products such as detergent additives having a density in the range 0.6-0.7 g/ml, a volumetric measure of capacity 25-75 ml preferably 30-60 ml is employed. For more conventional detergent products having a density in the range 0.4-0.5 g/ml a volumetric measure of capacity 200-300 ml preferably 240-280 ml is more suitable. In general, the measure is dimensioned such that a single unit dosage will

provide the desired quantity of product but several unit doses with a small measure can also be used to give the desired volume, particularly if it is desirable to maintain the same volumetric measure throughout a wide range of container sizes.

The actual dimensions of the measure are not critical per se except to the extent that they are restricted by the carton dimensions. However it is important that the relative proportions of the major dimensions of the measure are kept within certain limits to enable the predetermined amount of product to be dispensed easily and accurately and to enable the measure to be handled easily. Thus shallow tray-like configurations are excluded because of the difficulty of assessing the desired quantity accurately while narrow-necked tube-like configurations are excluded because of the difficulty of dispensing the product into them from the carton.

The proportions of the measure are therefore defined in three dimensions, two dimensions in the plane of the rim portion defining the configuration of the maximum opening of the measure, the third dimension defining its depth. A first reference direction is defined as being parallel to the fold line at the junction of each of the side and top panels of the carton. A second reference direction is defined as being perpendicular to the first direction in the plane of the rim portion. The depth dimension of the measure is measured in a direction perpendicular to the plane of the rim portion and is measured from that plane. The ratio between the maximum internal dimension of the opening in the first reference direction in the plane of the rim and the maximum internal dimension of the opening in the second reference direction in the same plane should lie in the range from 1:2 to 2:1 preferably from 1.5:1 to 1:1. The ratio of the maximum value of the larger of the two dimensions to the depth of the body should be in the range from 2:1 to 1:1 preferably from 1.5:1 to 1:1.

Within these constraints the measure can have any form such as eg. cylindrical, frustoconical, pyramidal cubic, hemispherical or conical. The cross sectional configuration in a plane parallel to that of the rim portion can similarly be circular, elliptical, triangular, rectangular, trapezoidal or any other polygonal form. Highly preferred shapes for the measure are cylinders and frustoconical bodies of circular or elliptical cross section.

The material of which the measure is made is not critical to the performance of the invention, but for ease in manufacture synthetic polymeric thermoplastic materials are preferred because of the ease with which they can be formed into bodies having closely defined dimensions. Thus acrylic and methacrylic polymers and copolymers, polystyrene polyethylene and polypropylene are exemplary materials from which the measure can be formed. Other materials such as metal foil and paperboard can be used but tend to be less satisfactory in that they are either more expensive or more difficult to form into the appropriate shape.

As noted earlier, it is intended that conventional packaging machinery should only require minor modification in order to be capable of handling the containers of the present invention. By minor modification it is meant that existing carton feed, erection and filling and closure operations can be used and that, prior to transfer of the filled cartons to the outer cases, additional equipment is employed to apply the reclosable lid.

Various embodiments of the invention are illustrated in the accompanying drawings in which

Figure 1 is a fragmentary exploded perspective view of a container showing the volumetric measure separated from the carton

Figures 2a-2d are fragmentary plan views of container top panels showing alternative aperture configurations and

Figure 3 is a perspective view from below of an alternative volumetric measure,

Figure 4 is a fragmentary exploded perspective view of an alternative container showing the volumetric measure, separated from the carton

Figure 5 is a view similar to that shown in Figure 1 of a further carton and volumetric measure combination and

Figure 6 is a fragmentary exploded perspective view of a modification of the structure shown in Figure 5.

Referring to Figure 1 of the drawings, there is shown a container incorporating paperboard carton generally indicated at 1 of which only the top portion will be described in detail. Carton 1 is formed of a one piece paperboard blank with side panels 2, 3, end panels 4, 5, a top panel 6 and a bottom panel which is not shown. Top panel 6 is formed of overlapping flap portions 7a, 7b hingeably attached to the top edges of side panels 2, 3, the lower flap portion 7b being formed with ears 8a, 8b adapted to overlie the upper extremities of end panels 4, 5, when the carton is sealed. End panels 4, 5 are also formed at their upper extremities with tuck flaps 9a, 9b respectively that underlie lower flap portion 7b. It will be understood that the bottom portion of the carton is of identical construction.

An elliptical dispensing aperture generally designated as 10 is formed in the top panel, by means of cut-out portions 11, 12 in flap portions 7a, 7b, respectively, the cut out portions being formed in the carton blank and being arranged to be in registration when the carton is erected. It can be seen that aperture 10 is adjacent one end of top panel 6 and it is generally preferred that the aperture is adjacent the junction of top panel 6 and end panel 4 in order to permit complete emptying of the carton contents. Depending on the proximity of the aperture to the end of top panel 6, it may also be

necessary to provide a cut-out portion on tuck flap 9a.

A thermoformed polystyrene volumetric measure, generally indicated at 20, also forms part of the container and comprises a rim portion 21 and a body portion 22 dependent therefrom. In position, rim portion 21 rests on top panel 6 and body portion 22 extends into the interior of carton 1, thereby acting as a closure for aperture 10. Both rim portion 21 and body portion 22 have an elliptical shape in lateral cross section and body portion 22 has a frusto-conical profile that is dimensioned such that its external periphery, in the area immediately adjacent rim portion 21, is in frictional engagement with the periphery of the aperture 10, thereby forming an effective closure of the carton.

In the embodiment shown the ratio of the lengths of the major and minor axes of the measure in lateral cross section are 2:1 and the ratio of the maximum major axis dimension to the depth dimension (as measured from the plane of the rim 21) is 1:1. The volume of the measure is 40 ml.

In the embodiment of Figure I, flap portion 7a is provided with beads of frangible adhesive 23, disposed around the periphery of aperture 10, that serve to maintain the measure in position on the carton after the latter has been filled and the measure inserted into the aperture for the first time. A generally rectangular paper cover sheet 24, of larger plan area than that of measure 20, overlies that end of the top 6 wherein the measure is located and is adhesively secured around its periphery to top panel 6. In an alternative arrangement volumetric measure 20 is not itself secured to top panel 6 but is maintained in position thereon by the cover sheet 24.

Figures 2a-2d illustrate alternative aperture configurations for a container in accordance with the invention.

Figure 2a shows a preferred configuration in which a circular aperture is enlarged to include the area

formed by two intersecting tangents, the direction of the enlargement being towards the end panel of the carton. This enables the carton to be completely emptied and permits the dispensing operation to be controlled more easily. Figure 2b shows a trapezoidal aperture, Figure 2c shows a circular aperture and Figure 2d a triangular aperture. In each case the measure may or may not have the same cross sectional configuration as the aperture as the only requirements are that the body of the measure fits within the aperture and the rim portion of the measure extends beyond the edges of the aperture.

Figure 3 illustrates a further embodiment of a volumetric measure suitable for use in a container in accordance with the present invention in which the opening of the body portion is at that end remote from the rim portion. The measure, generally indicated at 30, comprises a rim portion 31 of rectangular shape in plan and a body portion 32 which is triangular in lateral cross section. The body portion is closed by the rim portion 31 and is open at the end 33 remote from the rim portion 31. The measure is inserted into the carton in the normal manner during the packaging operation but is inverted after removal from the carton prior to use. One advantage of this structure is its suitability for cartons with little headspace or outage above the product as, on insertion into the filled carton, the open end of the measure can be pushed into the product with no damage to either.

It will be apparent that this embodiment can have a variety of cross sectional forms such as circular elliptical, triangular, rectangular etc., and normally the lateral cross section of the body portion will be constant over its depth.

Yet another embodiment of the invention is illustrated in Figure 4 in which the container is shown at an intermediate stage of the closure sequence with the upper flap portion 7a of top panel 6 in an unfolded position prior

to insertion of the measure into the carton 1. In this embodiment lower flap portion 7b is formed with a circular aperture 35 located approximately equidistant from the two side edges and from one end edge of the top panel 6. Lower flap portion 7b is also formed with two heavily scored lines 36, 37 extending from the periphery of aperture 35 to that corner of the flap portion remote from the hingeable attachment to side panel 2. Upper flap portion 7a is provided with a circular line of perforation 38 of diameter larger than that of aperture 35 and also with two lines of perforation 39, 40 extending parallel to score lines 36, 37 but having a greater degree of separation. Tuck flap 9b is also provided with an appropriate cut-out portion so that it does not underlie the area bounded by score lines 36, 37. On erection and filling of the container, a frustoconical measure 41 of circular cross section is inserted into aperture 35 so that its body portion 42 extends into the carton and its rim portion 43 rests on the lower flap portion 7b. Upper flap portion 7a is then folded so as to overlie the measure and is adhesively secured to lower flap portion 7b, preferably by holt melt adhesive. The adhesive is applied so that part at least of the area of lower flap portion bounded by score lines 36, 37 is adhesively secured to the underside of the corresponding area of upper flap portion 7a. Measure 41 is then maintained in position by upper flap 7a until the container is opened by the user. The container is opened by tearing the upper flap portion 7a along the lines of perforation 39, 40 and thence along circular line 38 to expose measure 41. The rupture of upper flap portion 7a in this manner also causes the rupture of lower flap portion 7b in the area between score lines 36, 37 by reason of its adhesion to upper flap portion 7a. This provides a dispensing opening to the carton through which its contents can be easily poured into measure 41, without significantly weakening the carton structure.

Figure 5 illustrates an embodiment in which carton 1 is provided with an aperture 50 that is rectangular in configuration into which a measure 55 formed of synthetic plastics material and having a correspondingly dimensioned rectangular cross-section is adapted to fit snugly. Aperture 50 extends the full front-to-back dimension of the container and is located at one end of the carton top panel 6. There is no tuck flap on end panel 4 and flap portions 7a and 7b terminate at the aperture so that there are no attachments to face panels 2 and 3 along the sides of the aperture. Measure 55 comprises a slightly tapered hollow body portion 56 and a rim portion generally indicated at 57. Rim portion 57 comprises a downwardly extending skirt 58 disposed on three sides of the measure and a tongue 59 extending in a plane substantially perpendicular to the skirt and serving as a handle. When the measure is located in the aperture with skirt 58 overlying and sealing the carton along the exposed edges of face panels 2 and 3 and end panel 4 and with the tongue 59 overlying flap portion 8a. A Cover Sheet 51 is arranged to both the measure 55 and at least part of top panel 6 and is adhesively secured to the carton to retain the measure in position. For this purpose sheet 34 is provided with adhesive-coated ears 52 adapted to engage the upper extremities of face panels 2 and 3 and end panel 4.

A further modification of the Figure 5 embodiment is shown in Figure 6 in which the top edge of end panel 4 of carton 1 is formed with a rectangular flap 44 adapted to close rectangular aperture 50 and having a length so as to overlie the region of top panel 6 adjacent the aperture. The junction of flap 44 and end panel 4 is provided with perforations 45 for a purpose to be described. A rectangular measure 10 is adapted to fit within aperture 50 and is provided with a rim portion 61 and a body portion 62 dependent from the rim.

Rim portion 61 comprises two outwardly facing inverted U-shaped lips 63 disposed on opposite sides of measure 60 and an interconnecting flange portion 64 extending along a third side, the flange portion 64 being of greater area than lips 63 and serving as a handle. The edge 65 forming the fourth side of rim portion 61 is not formed with a lip or flange.

The measure 60 is disposed in the aperture 50 such that lips 63 engage the edges of side panels 2, 3, and the flange 64 overlies top panel 6, thereby providing a seal along three sides of the aperture. The absence of a lip on edge 65 of measure 60 enables the flap 44 to be folded to overlie measure 60 so as to maintain the latter in position. The flap itself is held in position by adhesive attachment of its free end to top panel 6 preferably using a hot melt adhesive.

The carton is erected and filled in the conventional manner and the flap portions forming top panel 6 an folded over and closed. The measure 60 is then inserted into the carton and final sealing takes place on the folding and attachment of flap 44 to top panel 6. The container is opened by rupturing the perforations 45 and discarding flap 44 so as to allow measure 60 to be removed from and replaced in aperture 50 while the container is in use.

CLAIMS

1. A container comprising a paperboard carton having side and end panels, and a top and bottom panel each formed by overlapping flap portions hingeably attached to opposed side panels, at least one of the flap portions forming the top panel being shaped to define a dispensing aperture therein, said aperture being sealed by a reclosable lid, characterised in that the reclosable lid comprises a detachable volumetric measure formed with a rim portion adapted to engage the top panel and a hollow body portion depending from the rim portion and extending into the carton interior through the aperture, the cross sectional configuration of the hollow body in the plane of the rim portion being defined with reference both to a first reference direction extending parallel to the lines of hingeable attachment of the flap portions to the side panels, and to a second reference direction perpendicular to the first reference direction in the plane of the rim portion, the ratio of the maximum cross sectional dimensions in the respective directions being in the range from 1:2 to 2:1, the ratio of the maximum value of the larger of said two dimensions to the depth of the body, as measured from the rim, lying in the range from 2:1 to 1:1, the body having a volume of at least 25 ml.

2. A container according to Claim 1 characterised in that the ratio of the maximum cross sectional dimensions is in the range 1.5:1 to 1:1 and in that the maximum cross sectional dimension:depth ratio is in the range 1.5:1 to 1:1.

3. A container according to either one of Claims 1 and 2 characterised in that the hollow body has a

volume in the range 30-300 ml.

4. A container according to any one of Claims 1-3 characterised in that the hollow body is formed with an opening in the plane of the rim.

5. A container according to any one of Claims 1-4 characterised in that the hollow body is of frusto-conical or frustopyramidal shape.

6. A container according to any one of Claims 1-5 characterised in that the reclosable lid is provided with a cover of area greater than the plan area of the lid, the peripheral edges of said cover being releasably secured to the adjacent carton surfaces.

. A container according to any one of Claims 1-6 characterised in that the edges of the flap portion or portions defining the aperture are engaged over at least a portion of their length by the outer periphery of the lid body portion at least in that part of the body portion immediately adjacent the rim portion, such engagement serving to retain the lid portion in position upon reclosure.

8. A container according to Claim 7 wherein the edges of the flap portion or portions defining the aperture are engaged over their entire length by the outer periphery of the body portion.

9. -A container according to any one of the preceding claims characterised in that the reclosable lid is formed of a polymeric thermoplastic material.

Fig. 1

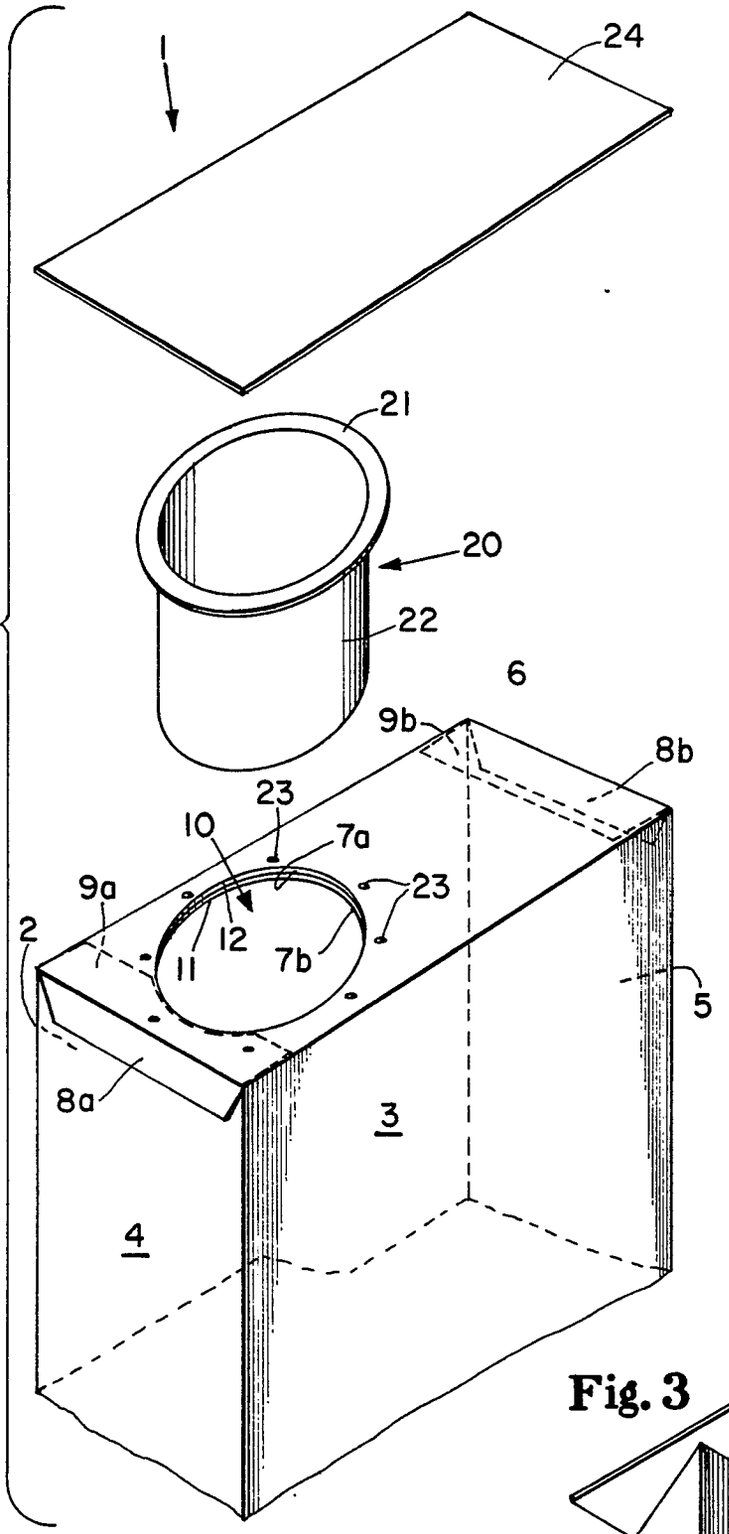


Fig. 2a

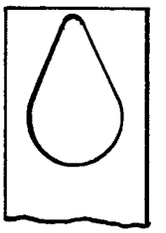


Fig. 2b

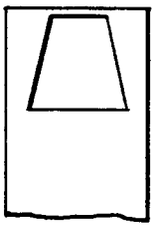


Fig. 2c

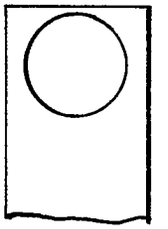


Fig. 2d

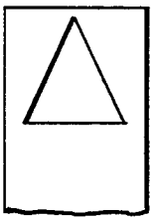


Fig. 3

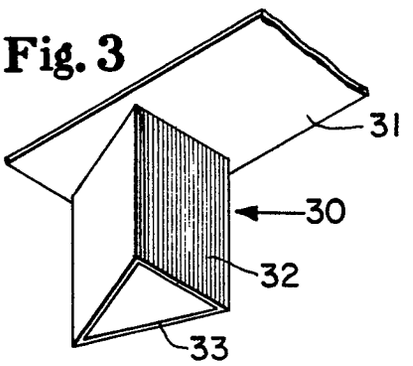
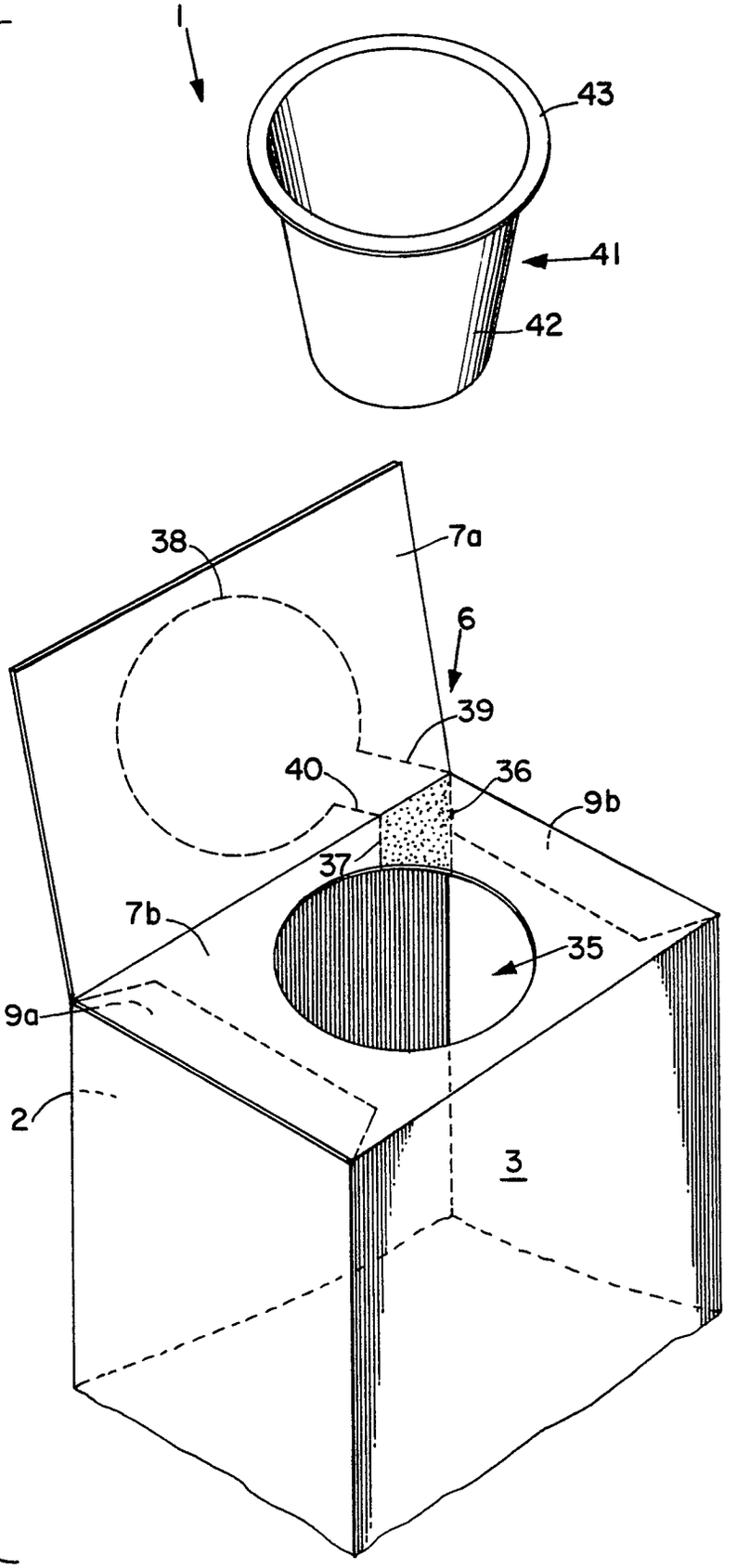


Fig. 4



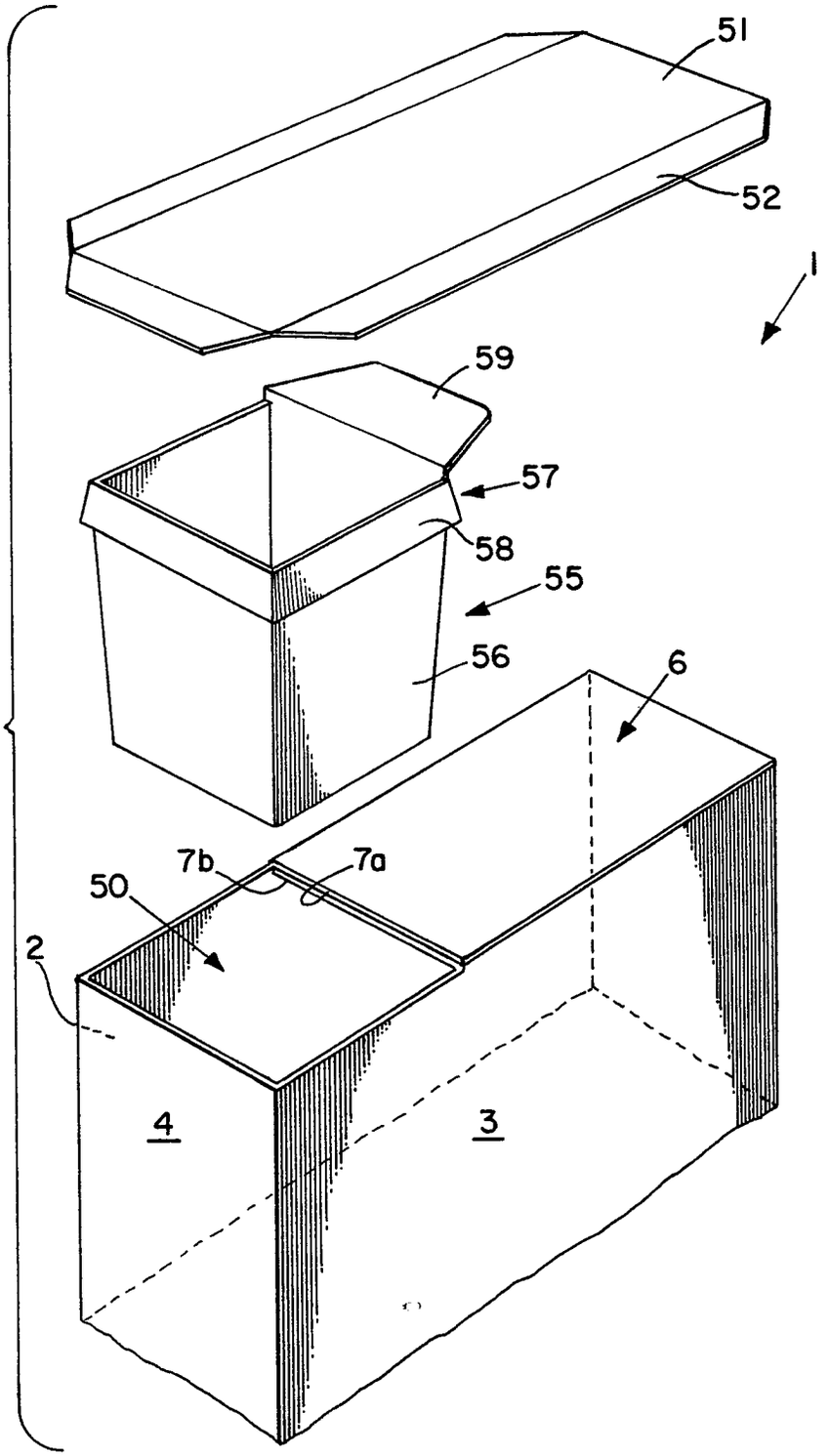


Fig. 5

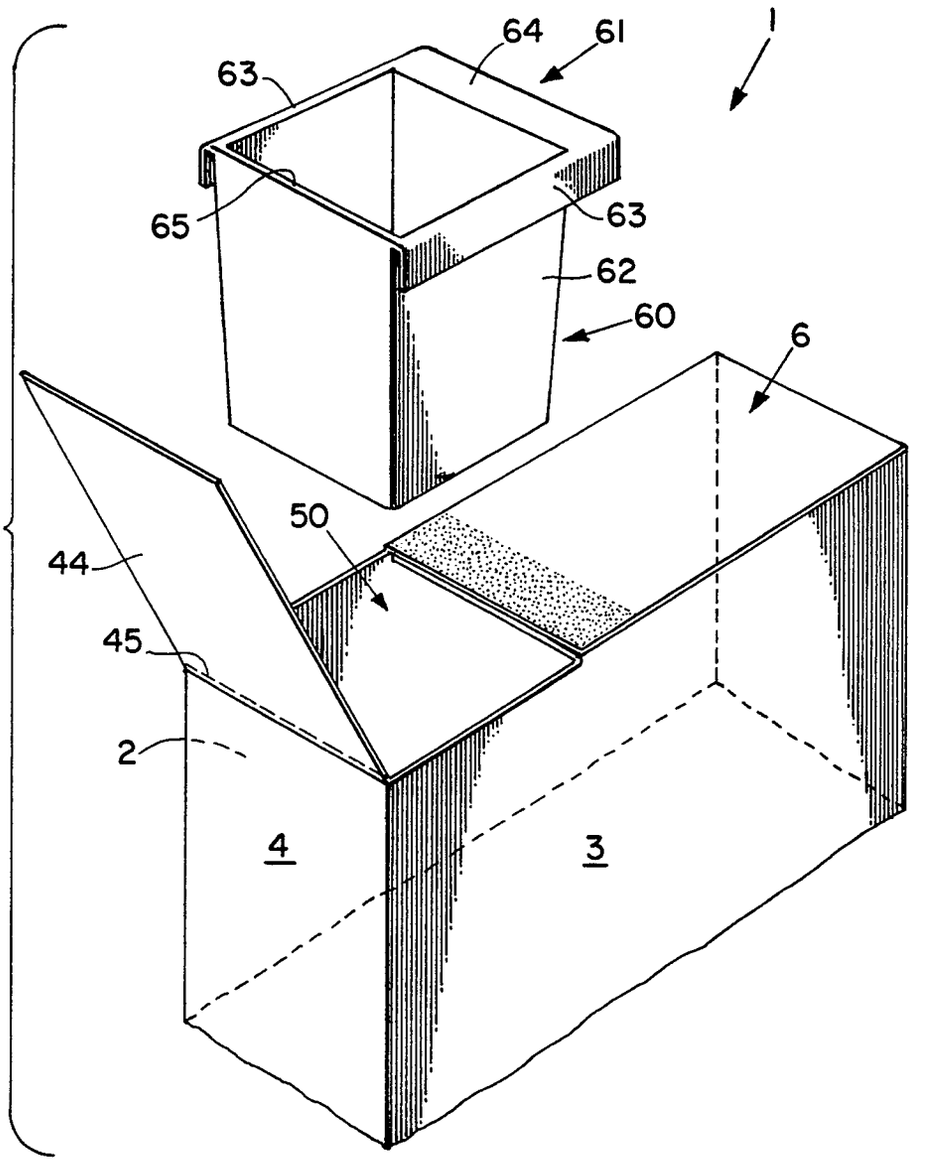


Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

0032806
Application number
EP 81 30 0138

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	FR - A - 337 628 (FERRARI) * In its entirety *	1,2,6-8
X	US - A - 3 126 926 (REDFIELD) * Column 1, line 62 - column 3, line 50; figures 1-8 *	1,6,9
D	DE - U - 7 428 677 (HENKEL) * Page 4, last paragraph - page 5, paragraph 1; figures 1-3 *	1,4,9

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

B 65 D 5/76

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

B 65 D

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15-04-1981	MARTENS

EPO Form 1503.1 06.78