Dec. 10, 1946. H. F. WATERS 2,412,544

REUSABLE COLLAPSIBLE LIQUID CARRYING AND DISPENSING CONTAINER

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Fig. 1

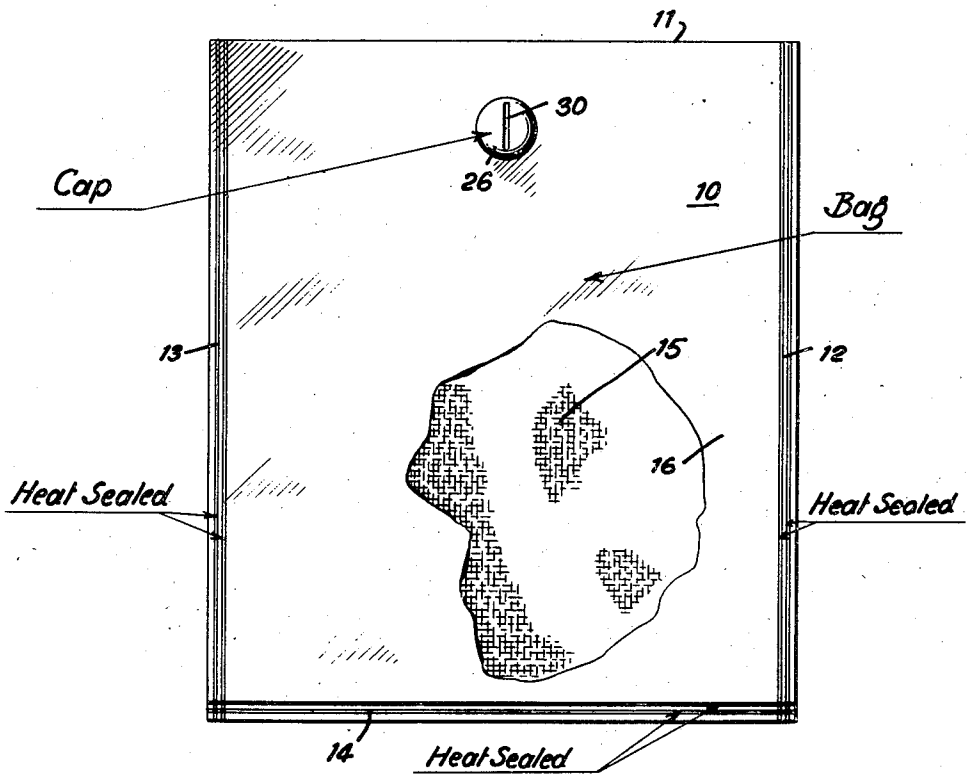
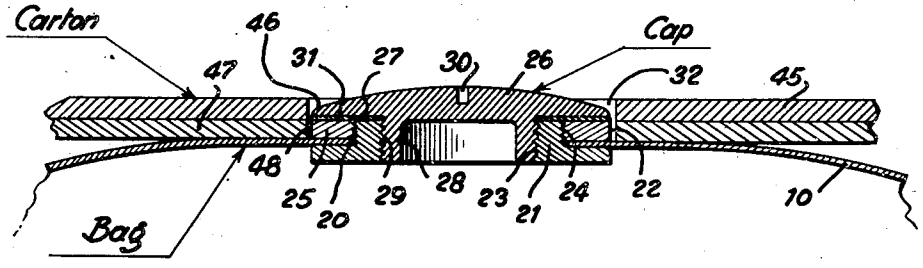


Fig. 2.



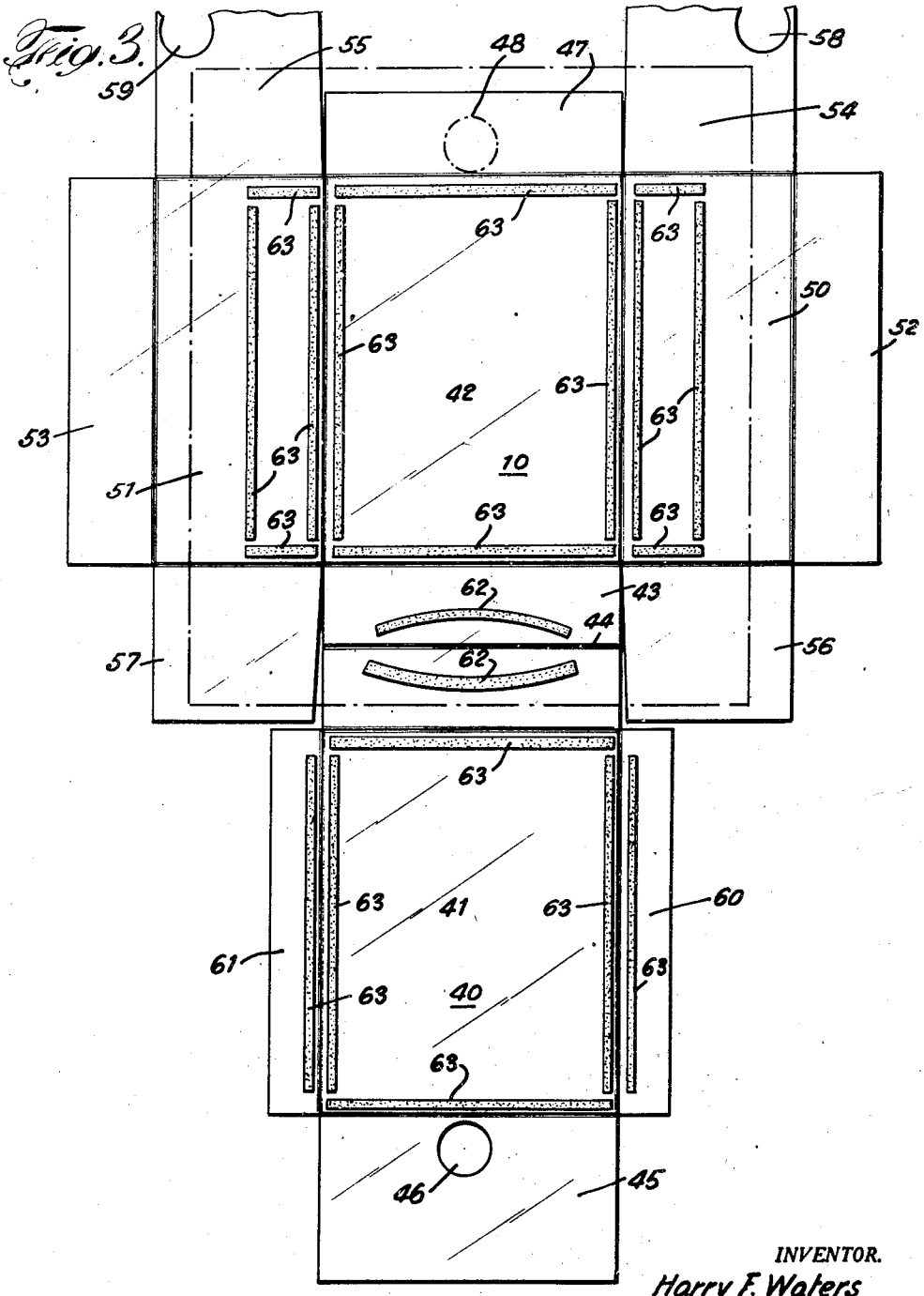
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Fig. 3.



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Fig. 4.

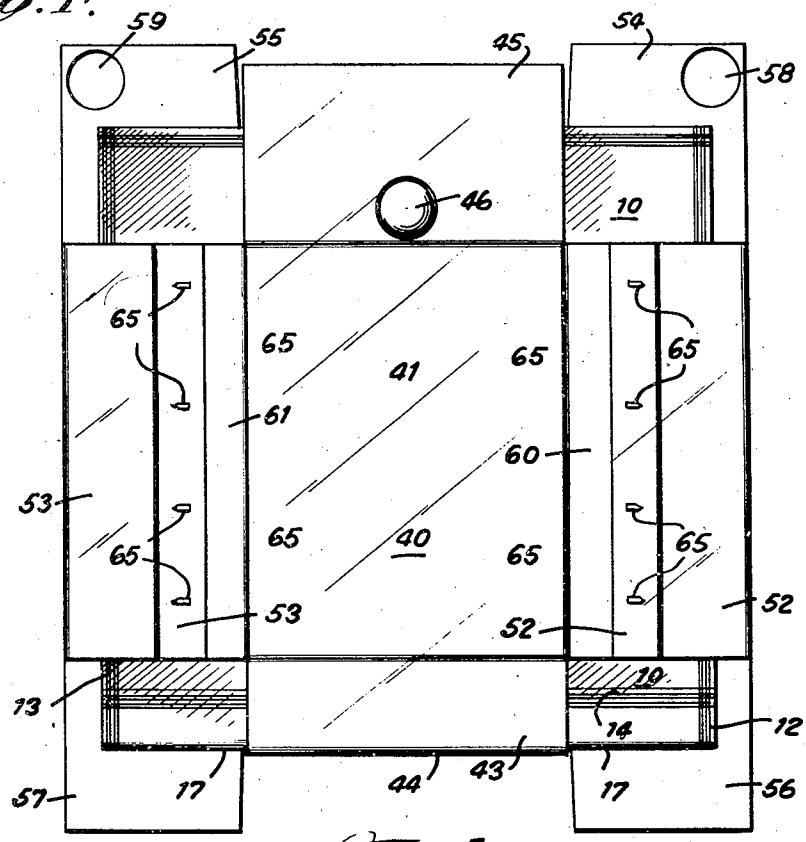


Fig. 5.

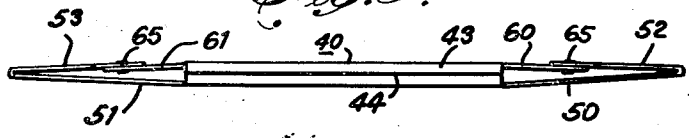
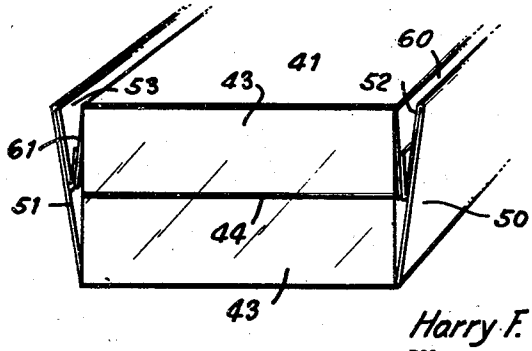


Fig. 6.



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Fig. 7.

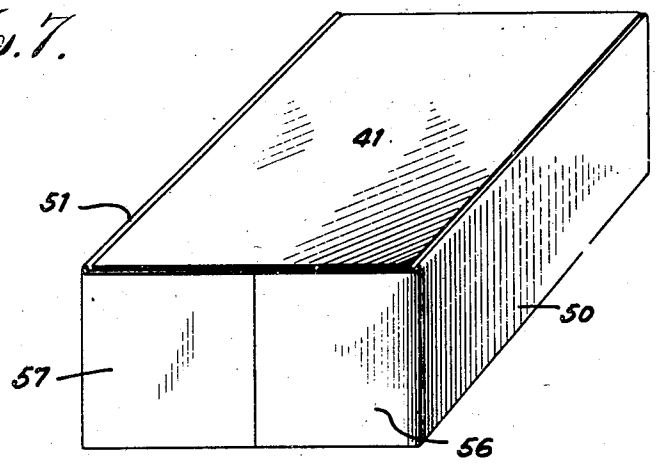
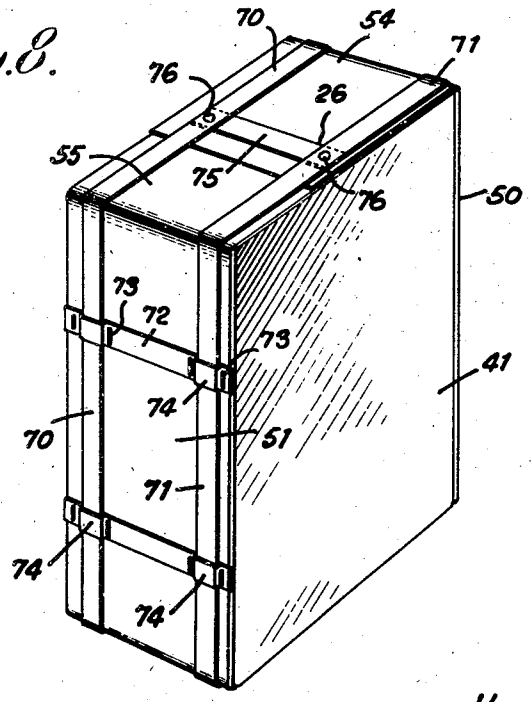


Fig. 8.



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2,412,544

UNITED STATES PATENT OFFICE

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REUSABLE COLLAPSIBLE LIQUID CARRYING AND DISPENSING CONTAINER

Harry F. Waters, New York, N. Y.

Application May 29, 1942, Serial No. 444,958

9 Claims. (Cl. 229—14)

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This invention relates to improvements in collapsible containers, and more particularly to a novel paperboard package of the flat-folded type adapted to be erected and squared up into a carrying package, and particularly adapted for the transportation of volatile liquids, such is high octane or aviation gasoline.

In the servicing of aeroplanes in inaccessible regions, such as are found in the wilds of Canada and Alaska, in South America, China, and Africa, it has been customary to transport gasoline in cans to interior depots. The reuse of the cans is economically a factor, but empty cans do not form a desirable return pay load. In addition, return trips from remote regions involve the utilization of any available space for the shipment of special ores and other products of high value, and in certain war areas, of wounded combatants for hospitalization in protected zones removed from the fighting areas. The necessity for reducing non-pay load to an absolute minimum, is further exemplified in the cases where transport must be had over remote, mountainous regions where containers of aviation gasoline or the like must be transported on the backs of porters, or on the backs of animals. To return empty containers, by such means, over enormous stretches of inaccessible territories, introduces a severe bottleneck in such transportation systems.

It has now been found that by combining liquid-tight bag containers with paperboard cartons, and desirably with dispensing apertures or spouts preformed in the bags, gasoline containers and the like can be made in flat-folded form, adapted to be erected into squared-up, load-carrying condition, and filled at a central filling station after which they can be transported in any desired manner. Upon unloading at the end of the route, either in a suitable reservoir or directly into the aircraft or other places of immediate use, the containers may be flat-folded and returned for refilling and reuse. The obvious saving in space and weight by flat-folding reusable containers, is very appreciable, and cargo space formerly given over to carrying of empty tin cans can now be released and utilized for the transportation of pay loads.

The features of novelty of the present invention therefore, are to be found in the fabrication and use of heavy-duty reuseable containers of paperboard with associated bag liners of liquid-proof material, desirably reinforced with fabric, and being relatively oversized with respect to the carton or casing to permit displacement of the packaged contents without disruption of the package, even though the casing may be severely crushed or damaged. These and other desirable features of novelty and advantage of the present invention will be described in the specification and illustrated in the accompanying drawings, a certain preferred embodiment being shown by way of example only, for, since the underlying principles may be incorporated in other specific package structures, it is not intended to be limited to the ones here shown, except as such limitations are clearly imposed by the appended claims.

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In the drawings, like numerals refer to similar parts throughout the several views, of which

Fig. 1 is an elevation of a bag liner with a capped dispensing aperture;

Fig. 2 is a vertical section taken through the capped aperture, and associated bag and carton sections;

Fig. 3 is a plan view of a flat carton blank with a formed bag laid thereon;

Fig. 4 is a view of the combination of Fig. 3 with the carton blank folded into carton shape over the bag;

Fig. 5 is a bottom view of the fold line of the bottom panel of Fig. 4;

Fig. 6 is an end view of the package of Fig. 4 in squared-up position with the side panel folded in against the package;

Fig. 7 is an elevation of a finished carton;

Fig. 8 is a vertical elevation of the carton of Fig. 7.

Referring now to the drawings, there is shown in Fig. 1 a bag container 10, having a medial top fold line 11, lateral seams 12, 13, which may desirably be heat sealed, and a bottom transverse seal 14 which also may desirably be heat sealed. The bag 10, instead of being folded over, may be comprised of two sheets laid together and sealed around the four edges, and with or without a sealing tape around and over the edges. The fabric or material 10 may comprise a supporting cloth mesh, or fabric 15, impregnated or coated on both sides with a liquid-tight composition 16. The impregnating or coating material, which is desirably thermoplastic, may comprise cellulose derivatives, vinyl resin compositions, rubber hydrochloride, and the like. For heavy duty uses, solvent-resistant synthetic rubbers may be used, and desirably with laminated fabric supports. Where synthetic rubbers are used, the seams of the bags may be vulcanized as may the body of the bags. While the bag 10 has been shown as made up of a flat sheet folded over along a fold line 11, with three marginal heat seals, it is to

be understood that the container may be made of two sheets sealed along all four edges, as noted above. In the fabrication of the bag or bladder, it has been found by test and use that the best results are secured by using as the least amount of bladder or bag stock, that which corresponds to the ratio; depth 2½; width 4; heighth, from 4 to 7.

The bag is provided with an aperture 20 located at one end, and at any position desired for pouring. The closure comprises a ring member 21, having a bearing flange or shoulder 22, an inner annular thread 23, and an outer annular thread 24. The ring 21 is inserted in the aperture 20 and locked in place by threaded locking ring 25 engaging threads 24. A cap or stopper 26, having a bearing shoulder 27, and a depending annulus 28, is threaded at 29, to engage threads 23 of ring 24. The cap 26 may be provided with a slot 30 to facilitate the turning of the same, and the ring 21 and locking ring 25 may be provided with apertures, not shown, to permit the use of spanner wrenches or other devices to lock the same in position. The cap 26 may have a bearing against a gasket member 31 inserted thereunder. The dispensing outlet 21 and its closure 26 are relatively wide and flat in order to prevent protuberances beyond the surface of the carton either in the flat folded condition, or in the squared-up, erect condition. As shown in Fig. 2, the dispensing aperture and cap fit in a well 32 in the top flaps of the carton or casing.

Turning now to Fig. 3, a bag container 10, is shown, in dotted line representation, laid on a carton blank 40. This member comprises front and back wall panels 41, 42, joined by bottom panel 43, having a central fold line 44. Panel 41 has a top flap 45, with an aperture 46, while panel 42 has a top flap 47, with an aperture 48, adapted to enregister with aperture 46 when the carton is set up in operative position. Side panels 50, 51 extend outwardly from panel 42, and these members have lateral extensions 52, 53, with top tabs 54, 55, and bottom tabs 56, 57. Tabs 54, 55 may have apertures 58, 59 adapted to enregister with apertures 46, 48 when the carton is set up. The panel 41 is provided with tabs or side panel sections 60, 61. Where heavy weight cartons are used and made up of 90 to 120-point board, the panels 60, 61 will be relatively short, and the panels 52, 53 relatively long. Where light weight cartons, for one-time jobs are made use of, 60-point board can be used, and the side panels will be increased or decreased in size, and desirably glued together, as more particularly set out and claimed in my Patent Number 2,223,754, of December 3, 1940. The several panels and tab sections are separated by fold lines, as indicated. Where gluing patterns are used, the bottom panel may have arcuate glue lines 62, while the other panels may have marginal glue lines, designated generally by the numeral 63. Upon folding the carton blank over on fold line 44, the bottom edge 14 of the bag 10 will be folded over, and a loop or bend 17, formed. Thereafter the side-wall flaps 52, 53, are folded over into engagement with side-wall tabs 60, 61, and the parts secured together by means of staples 65. As already explained, staples are used where heavy 90–120-point board is used for the carton 40, due to the difficulty of manipulating the heavy bag material at its lateral margins, about fold lines of the heavy carton. Where the lighter 60-point carton is used, gluing may be resorted to, in which case the gluing panels associated with wall panel

41 will be of appreciably greater area. With the bag in position, the carton is squared up to assume the shape shown in Fig. 6. Here it will be seen that the bottom 43 is flattened, and panels 50, 51 are folded in against the sides with panel sections 52—60 and 53—61 forming inturned bellows folds. This gives a four-sided box construction. In the construction shown in Fig. 6, the bottom tabs 56, 57 have been removed to show the bellows fold construction. In the view shown in Fig. 7, the panels 56, 57 are shown folded over in abutting engagement to cover and support bottom panel 43. In the view shown in Fig. 8, the panels 54, 55 are shown closed over the associated top panels 45, 47. To secure the container in its squared-up position of Figs. 7 and 8, a pair of straps 70, 71 are secured around the box along the narrow sides 50, 51 and the top and bottom. These straps may be spaced by webbing 72 secured to the side walls by staples or other means 73, and defining loops or holders 74. A top strap or handle 75 may be secured to the straps or webs 70, 71 by any suitable means, such as rivets 76. The straps 70, 71 may be provided with appropriate catches or buckles to permit loosening of the same when it is desired to restore the package to its flat-folded condition. On emptying the container, the cap 26 will be removed and the contents discharged, after which the cap is replaced, and the carton flat-folded and returned for further load. It will be appreciated that upon flattening of the bag liner and immediately replacing the cap, an effective vacuum is set up in the bladder or bag, retaining same in flattened-down condition without requiring the use of mechanical expedients, such as straps or other devices. While the cap 26 has been shown situated centrally of one side of the container, it will be appreciated that it may be placed at any corner thereof, and that the position of the dispensing aperture and closure will be varied accordingly.

From the above, it will be seen that flat-folded containers, adapted for continued, multiple reuse, in the shipment of aviation gasoline, and special liquids, has been provided, and that these novel containers comprise a liquid-tight bag liner which may be erected with a flat-folded carton blank and squared-up into position, or which may be made up of a preformed carton into which the preformed bag may be inserted. Due to the appreciable oversize or capacity of the bag, with respect to the cubical capacity of the container or carton, in its operative set-up condition, the filled package can be subjected to very rough usage, including all standard I. C. C. tests for individual containers for high-test gasolines and other volatile liquids, and meet and exceed all such specifications with a considerable margin of safety. The inner, oversize bag liner will permit the liquid content to be displaced without introducing any hydrostatic head or hammer effect in the combination, so that even if the outer carton is badly damaged there will be no leakage unless the bursting point of the inner container is reached.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. A flat-folded erectable lined carton, erectable into squared-up, use position, said liner comprising a flat, preformed, pre-sealed, liquid-proof bag, and said carton comprising front and back wall panels, a foldable bottom panel, joining the wall panels, two full size side panels, and joining

sections joining the side panels to one wall panel, said joining sections forming bellows folds gripping the sides of the bag liner when the carton is erected into squared-up use position to square up the said liner.

2. A flat-folded erectable lined carton, erectable into squared-up, use position, said liner comprising a flat, preformed, pre-sealed, liquid-proof bag, and said carton comprising front and back wall panels, a foldable bottom panel, joining the wall panels, two full size side panels, and two-part joining sections joining the side panels to one wall panel, said joining sections forming bellows folds gripping the sides of the bag liner when the carton is erected into squared-up use position to square up the said liner.

3. In a construction as called for in claim 2, securing means for joining sections, comprising gluing areas.

4. In a construction as called for in claim 2, securing means for joining sections, comprising mechanical securing means.

5. In a construction as called for in claim 2, securing means for joining sections, comprising mechanical securing means of the group comprising staples, rivets, and stitching.

6. A flat-folded, reusable shipping package, comprising a marginally seamed, liquid-proof bag, and a supporting and forming means for squaring up the package associated therewith, said means comprising a flat-foldable, knockdown casing disposed therearound and including foldable side panels joined to a wall panel by separate bellows-fold gripping sections, said gripping sections securing the sides of the bag when the package is erected into use position.

7. A liquid container according to claim 6, in which the cubical capacity of the bag is greater than the cubical content of the forming member.

8. A liquid container according to claim 6, in which the cubical capacity of the bag is greater than the cubical content of the forming member in both flattened and erected condition.

9. A liquid container according to claim 6, in which the least amount of bag or bladder stock is defined by the ratio; depth, 2½; width, 4; heighth, at least 4, and up to and including 7.

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