

March 4, 1969

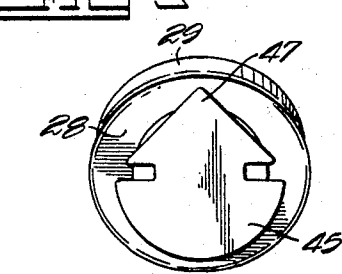
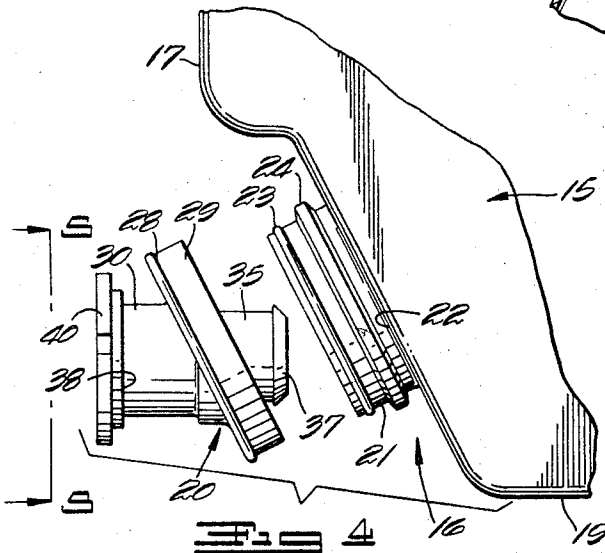
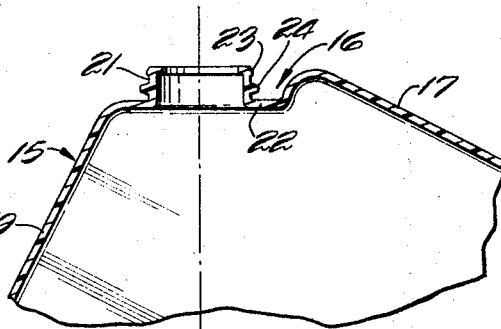
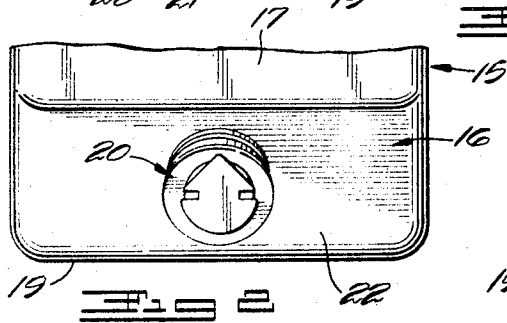
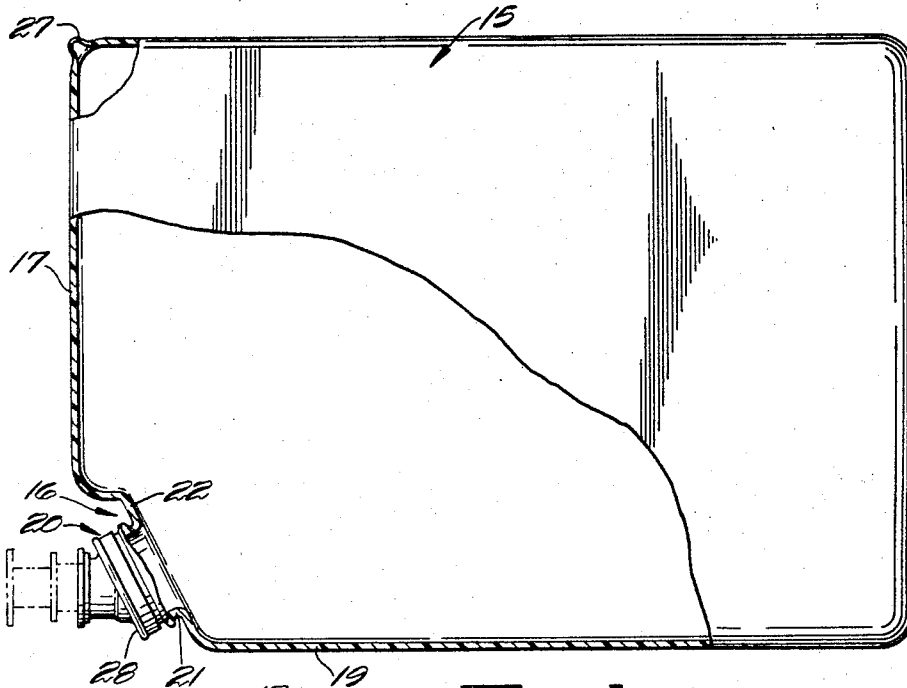
J. P. CONNERS ET AL

3,430,824

LIQUID CONTAINER WITH DISPENSING VALVE

Filed Feb. 13, 1967

Sheet 1 of 3



INVENTORS
JOHN P. CONNERS
SAMUEL B. DAVIS
BY
MAHONEY, MILLER & RAMBO
BY *Wm. V. Miller*
ATTORNEYS

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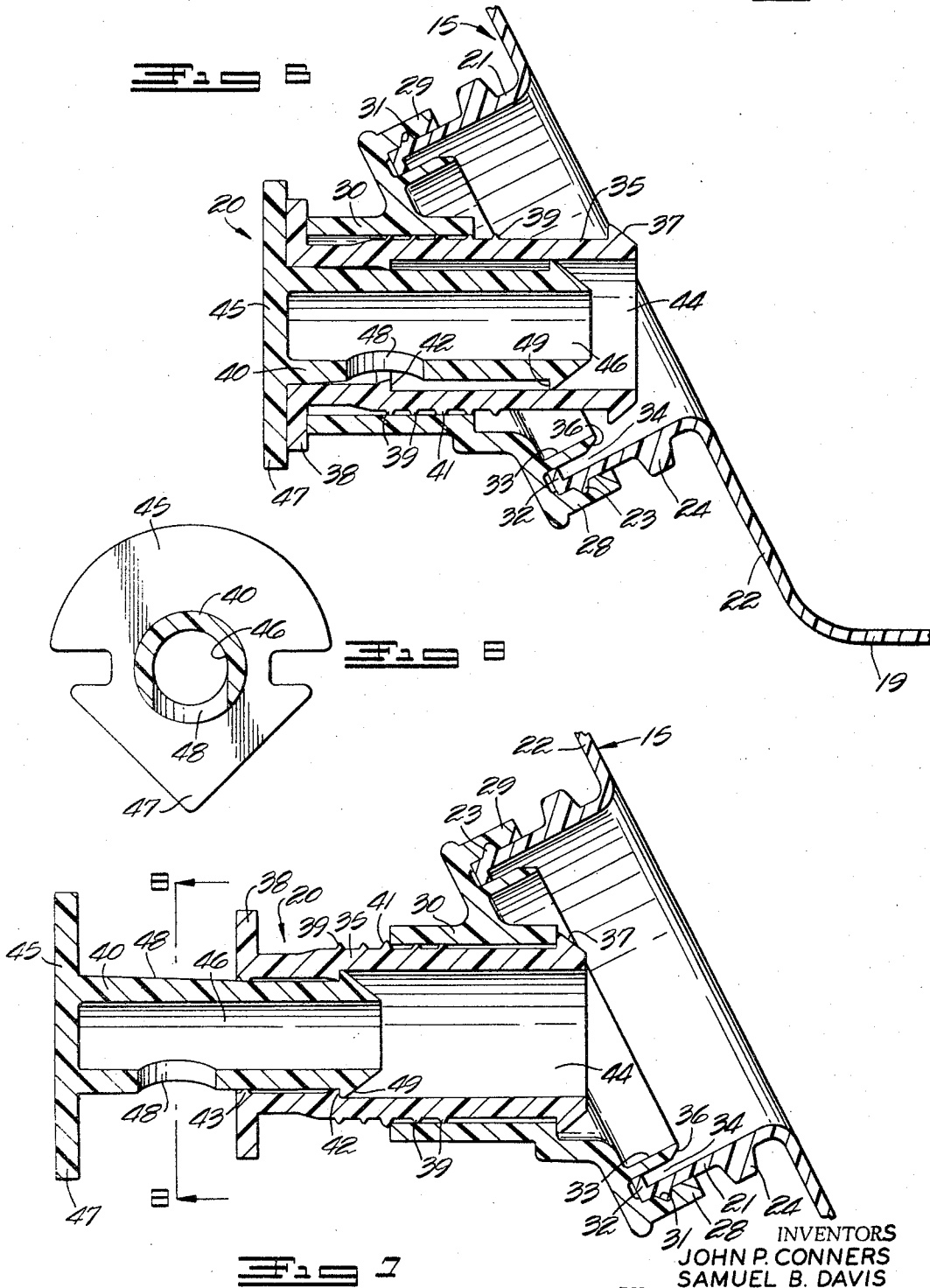
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 SAMUEL B. DAVIS
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 MAHONEY, MILLER & RAMBO
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Wm. V. Miller
 ATTORNEYS

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Sheet 3 of 3

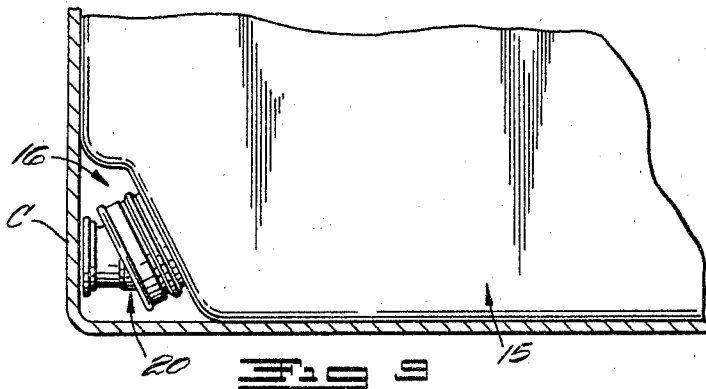


Fig. 9

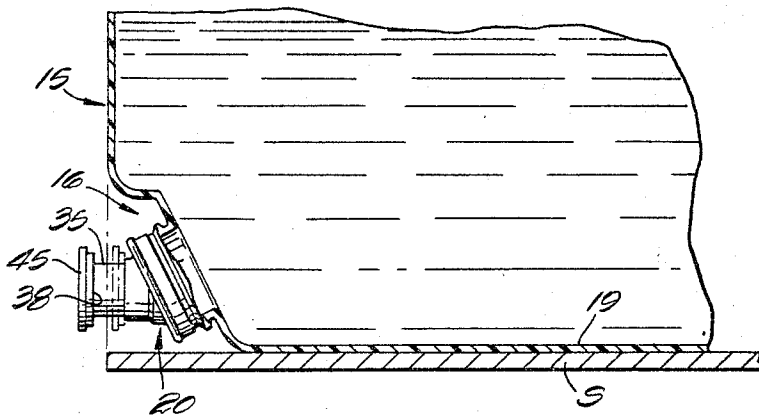


Fig. 10

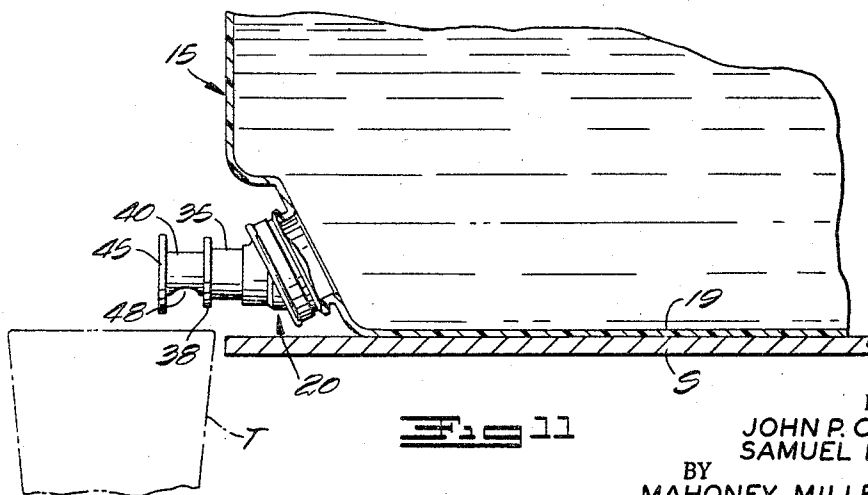


Fig. 11

INVENTORS
JOHN P. CONNERS
SAMUEL B. DAVIS
BY
MAHONEY, MILLER & RAMBO
BY *Wm. V. Miller*
ATTORNEYS

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3,430,824

LIQUID CONTAINER WITH DISPENSING VALVE

John P. Connors, Lancaster, and Samuel B. Davis, Columbus, Ohio, assignors to The Corrugated Container Company, Columbus, Ohio, a corporation of Ohio

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ABSTRACT OF THE DISCLOSURE

According to this invention, a container is provided for liquids and is preferably of rigid or semirigid thermoplastic resin material. The container is provided with a neck having an opening through which the container is filled with liquid and also through which the liquid is dispensed. Mounted on this neck is a dispensing valve assembly of novel form which is also preferably of thermoplastic resin material. The container neck is so disposed and the valve assembly is so positioned therein that normally all parts of the valve assembly, as well as the container neck, are disposed in a pocket which is recessed within adjacent wall surfaces of the container so that the valve assembly is protected from damaging contact with surfaces such as the surfaces of a shipping case in which one or more of the containers are disposed. The valve assembly includes a dispensing valve and a mounting and positioning means for movably mounting it on the container neck. The mounting and positioning means permits the bodily movement of the valve from a retracted position within the pocket to an extended position where the valve can be actuated readily between closed and opened positions and where a receiving tumbler or cup can be positioned effectively relative thereto to receive the dispensed liquid.

In the accompanying drawings, there is illustrated a preferred embodiment of a liquid container and associated dispensing valve assembly according to this invention but it is to be understood that various specific modifications can be made without departing from basic principles of the invention.

In these drawings:

FIGURE 1 is a side elevational view, partly broken away, of the liquid container with the dispensing valve assembly mounted thereon showing the container resting on its bottom wall surface in dispensing position.

FIGURE 2 is a fragmentary front elevational view showing the lower corner of the container with the valve assembly mounted thereon.

FIGURE 3 is an enlarged fragmentary sectional view of the corner portion of the container at which the filling and dispensing neck is disposed showing the container in such a position that the neck axis is vertical, which is the filling position of the container.

FIGURE 4 is an enlarged fragmentary side elevational view of the dispensing valve assembly spaced from the associated container neck at the recessed corner of the container.

FIGURE 5 is a front elevational view or face view of the valve assembly taken substantially from the position indicated at line 5-5 of FIGURE 4.

FIGURE 6 is an enlarged axial sectional view of the dispensing valve assembly on the container with the valve assembly retracted and the valve closed.

FIGURE 7 is a view similar to FIGURE 6 with the valve assembly extended into dispensing position and with the valve opened.

FIGURE 8 is a transverse sectional view taken substantially on line 8-8 of FIGURE 7.

FIGURE 9 is a fragmentary sectional view showing the

container and valve assembly mounted thereon, positioned in a shipping case with the valve assembly and associated container neck protected from contact with the case.

FIGURE 10 is a schematic view showing the container positioned on a shelf with the valve mounting means extended so as to dispose the valve in dispensing position beyond the shelf.

FIGURE 11 is a view similar to FIGURE 10 but showing the valve opened to dispense the liquid from the container.

With specific reference to the drawings, the liquid container is indicated in FIGURE 1 generally by the numeral 15 and the dispensing valve assembly mounted thereon is indicated generally by the numeral 20.

The container 15 is preferably substantially rigid or semirigid and formed from thermoplastic resin material such as polyethylene, propylene, or the like. It is preferably formed by a blowing operation so that it will have relative thin wall sections and, consequently, will have a minimum overall weight. It is formed with a recess or pocket recessed within the contour of the container and shown in the preferred example as a recessed corner 16 which preferably extends completely transversely across that corner of the container which would be formed by continuations of the vertical plane of the flat front wall 17 and the horizontal plane of the flat bottom wall 19. All of the other corner junctions of the various walls of the container 15 are at substantially right angles and it will be noted that the container is, with the exception of the corner 16, of substantially cubical form, having rectangular longitudinal vertical, longitudinal horizontal and transverse vertical cross-section. In one example, the container is made for containing and dispensing milk and will be made of standard or common forms or sizes such that two of the containers will fit snugly side-by-side in the usual wire shipping or handling cases now commonly employed in home-delivery dairies.

The container 15 is provided at the corner 16 with the neck 21 which is formed integral with the angularly-disposed transverse wall 22 which extends the full width of the front of the container and joins the front wall 17 with the bottom wall 19. The axis of the neck 21 is normal to the plane of the wall 22 and, therefore, is downwardly and outwardly inclined. Therefore, the integral neck 21 extends downwardly and outwardly from the lower front portion of the container and there will be a gravity flow of liquid from the container through the neck 21 when the filled or partially filled container is resting on the bottom 19 and the valve of the assembly 20 is open.

The angular disposition of the neck 21 not only provides for mounting the valve assembly 20 in a convenient protected location but also facilitates manufacture of the container in a blow mold. The neck will be formed at the continuous neck ring of the blow mold and will be free of mold parting lines. This is important in producing the outwardly projecting continuous sealing lip 23 on the exterior of the neck which is spaced slightly axially inwardly from the outer extremity thereof and which is free of projections so as to provide for a more effective seal. Axially inwardly of the sealing ring 23, a heavier reinforcing ring 24 is also preferably formed on the neck. The neck will be semirigid but can be flexed to some extent which is desirable in mounting the valve assembly 20 thereon. Also, the disposition of the neck 21 as indicated makes it possible to substantially fill the container, the filling being accomplished by a filler machine nozzle engaging the neck 21. Since the container 15 is substantially rigid, it must be provided with a vent opening. This may be provided by means of a hollow teat 27 which may project from the container at the upper and forward corner thereof and which may be snipped off to provide the vent opening so that air pressure can

enter the container and cause the liquid to flow therefrom when the valve is opened.

As indicated, the valve assembly 20 is adapted to be mounted on the neck 21 and it is so formed, as shown in FIGURES 1 and 4, that it can be mounted with its main axis horizontal, that is, parallel with the bottom wall 19 or at a right angle to the vertical front wall 17. The valve assembly 20 is shown best in FIGURES 1, 4-8 and is made of a substantially rigid thermoplastic resin such as polyethylene, propylene, or the like. It is preferably molded and includes a cap portion 28 having an integral guide-sleeve 30 formed thereon with the cap portion tilted or at an angle to the axis of the guide-sleeve. Mounted in the guide-sleeve 30 in sliding telescopic relationship thereto is a valve-mounting and positioning sleeve 35 and mounted in the sleeve 35 in sliding telescopic relationship thereto is the dispensing valve member 40.

The cap portion 28 has an annular inwardly extending peripheral flange or skirt 29 formed thereon and, as indicated in FIGURE 6, this flange is provided with a continuous annular locking groove 31 on its inner surface which is adapted to receive the locking ring 23 when the skirt 29 is slipped over the neck. This groove is so located that when the skirt is slipped over the neck, the ring 23 will snap into the groove and lock the cap portion on the neck. A sealing means is provided by an inwardly extending lip flange 32 which engages the outer surface of an inner skirt 33 which is concentric with the skirt 29. Thus, the cap 28 is provided with an inwardly opening annular socket 34 which receives the neck 21, and the neck and walls of the socket are provided with associated engaging locking and sealing portions. The outer skirt 29 is substantially rigid and will engage the neck extremity as it is positioned in the socket 34 and, if necessary, will flex the neck to cause the sealing lip 32 thereof to engage the inner skirt 33 with an effective sealing contact. Thus, if the neck 21 becomes slightly out-of-round during the curing of the resin thereof, it will be reshaped as it is forced into the socket 34. To facilitate entrance of the neck extremity into the socket, the inner skirt 33 is provided with a beveled surface 36 at its outer surface and inner extremity which serves to cam the extremity of the neck into the socket. As indicated, locking of the cap on the neck is provided for by the ring 23 snapping into the groove 31 of the outer skirt 29.

As indicated previously and as shown best in FIGURES 6 and 7, the valve mounting and positioning sleeve 35 is slidably telescopically positioned in the guide-sleeve 30. Both sleeves are of annular form and concentrically disposed. The sleeve 30 is of uniform diameter throughout its length and has a smooth inner surface. The sleeve 35 extends completely through the sleeve 30 and projects therefrom at both its inner and outer ends. Its projecting inner end is provided with an annular radially outwardly projecting stop ring or shoulder 37 which will engage the inner end of the sleeve 30 (FIGURE 7) to limit outward axial relative sliding movement of the sleeve 35 when it is extended to its outermost position. The outer projecting end of the sleeve 35 is provided with a radially outwardly projecting flange 38 which serves as a finger grip. The outer surface of the sleeve 35 is smooth except that it is provided with a series of axially spaced sealing rings 39 and a sealing and stop ring 41. The latter ring 41 preferably projects outwardly to a greater extent and a plurality of the rings 39 are located axially on each side thereof. When the sleeve 35 is retracted into the sleeve 30 (FIGURE 6), all these rings serve as sealing rings between the sleeve 30 and the sleeve 35. When extended (FIGURE 7), the ring 41 will snap into position and engage the outer end of the sleeve 30 and normally prevent axial movement of the sleeve 35 back into the sleeve 30, outward axial movement being prevented by the ring 37. Thus, the sleeve will be re-

strained from moving axially in either direction but is desired, it could be forced back into the sleeve 30, since the ring 41 will yield under sufficient pressure. The inner surface of the sleeve 35 is mainly smooth and continuous but of the sleeve 35 is mainly smooth and continuous but an inwardly projecting stop shoulder or ring 42 is formed thereon toward the outer end of the sleeve but spaced axially inwardly thereof. In addition, at its extreme outer end, there is provided an inwardly extending sealing ring 43. With the sleeve 35 of the form described, there is a liquid passage 44 formed therein and extending axially completely therethrough.

The valve member 40 is also in the form of an annular sleeve and, as indicated above, is telescopically slidably mounted in the supporting and positioning sleeve 35 and is in concentric relationship thereto. This sleeve has a liquid passageway 46 formed therein and extending axially thereof, being open at its inner end and being closed at its outer end by an integral cap and tab pull 45. This cap can be gripped with the fingers to axially move the valve 40 in the sleeve 35. It is in the form of a projecting flange which is partly semicircular, as indicated in FIGURE 8, but has a radially extending integral arrow or pointer 47. Toward its outer end, the valve member is provided with a dispensing opening 48 leading from the passage 46 with its axis radially disposed. The tip of the arrow 47 is in the same axial plane as the center of the opening 48 and the tip will always point toward that opening. The inner end of the valve member 40 is provided with a radially projecting stop shoulder or ring 49 which is adapted to contact with the shoulder 42 of the surrounding sleeve 35 to limit outward axial movement of the valve sleeve 40 relative to the sleeve 35. It will be noted that the outer surface 48 of the sleeve 40 is of nonuniform diameter having a gradual taper from its larger diameter outer end to a smaller diameter point close to its inner end at the stop shoulder or ring 49. Its larger end is of somewhat greater diameter than the internal diameter at the sealing ring 43 and, consequently, when the valve 40 is pushed inwardly, it will wedge tightly into sealing engagement with the ring 43 will be held in its inner sealing and closed position until actually pulled outwardly by means of the tab pull 45.

In use of the container and valve assembly, the container 15 will be filled with the liquid through the neck 21 and then the valve assembly 20 will be mounted thereon with the positioning sleeve 35 in its retracted position, as shown in FIGURE 6, at which time the flange 38 contacts with the outer end of the cap sleeve 30. The ring 41 will create sufficient frictional force on the interior of the sleeve 30 to keep the sleeve 35 in its retracted position and will provide a seal between the exterior of the sleeve 35 and the interior of the sleeve 30 intermediate the axial extent of the sleeve 30. The valve sleeve 40 at this time will be pushed inwardly as far as possible with its tab pull 45 in flat contact with the finger-engaging flange 38. The valve sleeve 40 will be wedged into this inner axial position within the sleeve 35 and will tend to stay there. The opening 48 will be disposed axially inwardly of the outer end of the sleeve 35 and will be covered thereby. In addition, there will be a sealing action between the enlarged outer end of the sleeve 40 and the surrounding sleeve 35 axially outwardly of the opening 48. Thus, liquid will be prevented from flowing from the passage 46 out through the opening 48. One or more of the containers 15 may be positioned in a case C, as indicated in FIGURE 9, and it will be noted that the valve assembly will be recessed in the corner pocket 16 so that it will not be damaged by contact with the corner of the case.

When the container reaches the consumer, it is removed from the case and may be supported in dispensing position with its bottom wall 19 resting on a shelf S. The container will be vented at 27 and care will be taken that the pointer 47, instead of pointing upwardly, as in FIGURE 4, will point straight downwardly, as indicated in

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FIGURE 8, to insure that the dispensing opening 48 is lowermost so that liquid will flow downwardly properly from the container when the valve is opened. The axis of the valve member 40 will now be horizontal and its outer or tab end 45 will be in substantially vertical alignment with the outer edge of the shelf, as indicated by broken lines in FIGURE 10. However, to properly position the valve for dispensing without interference with the shelf, the positioning sleeve 35 is pulled outwardly to the full line position indicated in FIGURE 10. This can be accomplished by gripping the flange 38 and pulling axially outwardly on the sleeve 35 to overcome friction at the ring 41 and move the sleeve outwardly until the ring snaps in front of the outer extremity of the sleeve 30, as shown in FIGURE 7. At this time, the flange 38 will be outwardly beyond the edge of the shelf but the opening 48 will still be covered by the sleeve 35 since the valve sleeve member 40 will still be in its inner position retracted into the sleeve 35 and no liquid can escape since the opening is closed and there is a tight seal outwardly beyond the opening produced by the wedging action of the outer portion of the sleeve 40 within the outer portion of the sleeve 35. To dispense the liquid, the pull tab 45 is grasped with the fingers and the valve sleeve 40 is pulled axially outwardly, as indicated in FIGURE 11, to overcome the wedging action and the downwardly directed opening 48 will be moved to a dispensing position which will be well beyond the outer edge of the shelf S. This will facilitate positioning of a receiving cup or tumbler T therebelow to receive the gravity flow of liquid discharging through the outlet opening 48. At this time, there will be a seal behind the opening 48 provided by the ring 43 so that there will be no leakage between the two sleeves 35 and 40.

When it is desired to again close the valve, the fingers of one hand can straddle the projecting sleeve 35 behind the flange 38 and the thumb can push inwardly on the tab 45 to move the valve sleeve 40 back into the sleeve 35 in a wedged closed and sealed position.

It will be apparent that this invention provides a dispensing package which includes a liquid container of a novel structure and a cooperating valve assembly of a novel structure which together form a cooperating combination effective for dispensing various liquids, especially for home consumption, the combination being such that it can be readily supported on a refrigerator shelf in dispensing position with the axis of the valve horizontal or parallel to the plane of the shelf. The container and valve combination can be readily handled without danger of damage to the valve assembly due to the fact that the valve assembly is in a pocket recessed within the contour of the container. The container and valve assembly can both be formed inexpensively of plastic so that the combination can be used once only and not returned to the dairy for refilling.

Many advantages of the invention have been discussed above and others will be apparent.

Having thus described this invention, what is claimed is:

1. A dispensing package comprising a container and a dispensing valve assembly mounted thereon, said container being of a semirigid material and a selected contour surface and having a recess formed in the surface thereof within said surface, an outlet for the container at said recess through which it may be filled and through which the contents of the container may discharge having a connecting axially fixed guide-sleeve portion extending outwardly from said outlet but disposed within said recess so as not to project beyond the adjacent contour surface of the container, said valve assembly comprising a valve member in the form of a hollow valve sleeve having a closed outer end and an open inner end, with a dispensing opening leading radially outwardly therefrom adjacent the outer end of said sleeve, a positioning sleeve open at both its inner and outer ends in which said valve sleeve

is slidably disposed for axial telescopic movement between a retracted position where said dispensing opening thereof is within and closed by the positioning sleeve and an extended position where the opening is outwardly beyond the outer end of the positioning sleeve in opened position, said positioning sleeve being mounted for axial sliding telescopic movement within said guide-sleeve portion for movement between a retracted and an extended position so that when the valve sleeve is in retracted condition within the positioning sleeve and the positioning sleeve is in retracted position within the guide sleeve portion, the outer end of the valve sleeve will be disposed within said recess and the associated contour surface of the container but when the positioning sleeve is extended outwardly of the guide sleeve portion, the outer end of it will be outwardly positioned out of said recess and outwardly of said contour surface to facilitate telescopic sliding movement of the valve sleeve in the positioning sleeve and so that when the valve sleeve is extended outwardly of said positioning sleeve into dispensing position, the dispensing opening thereof will also be located outwardly of said recess and the associated contour surface to facilitate positioning of a receiving receptacle relative thereto, said positioning sleeve and said guide sleeve portion having interfitting portions to hold the positioning sleeve in its extended outermost axial position relative to said guide sleeve portion, said container surface of the container including a vertical wall and a horizontal bottom wall with the recess being located between said walls to include as a portion thereof an angle transversely extending inner connecting wall joining said walls, said outlet being located along said angle connecting wall portion intermediate the extent thereof with the connected guide sleeve portion having its axis substantially parallel to the horizontal plane of the said container bottom wall.

2. A dispensing package according to claim 1 in which the container is provided with an outwardly projecting neck surrounding said outlet on said angled wall having its axis normal to said angled wall and having an outer open end which is inwardly within said vertical plane of said vertical wall, and means for mounting the guide sleeve portion on said neck, said means comprising a flanged cap sealingly engaging the outer end of said neck and carrying said guide sleeve portion with its axis at an angle to said cap so that the guide sleeve portion will have its axis parallel to the horizontal plane of the said container bottom wall and normal to the plane of the said container vertical wall.

3. A dispensing package according to claim 2 in which said flanged cap comprises a substantially disc-like portion with inner and outer concentric flanges thereon providing an inwardly opening annular socket for receiving said neck which projects outwardly from said angled wall and is substantially annular, said neck having an inwardly extending continuous annular sealing lip extremity and an outwardly extending continuous locking ring, said outer flange having a continuous groove for receiving the locking ring to force the inner flange in contact with said inwardly extending sealing lip.

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ROBERT B. REEVES, *Primary Examiner*.

NORMAN L. STACK, Jr., *Assistant Examiner*.

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