

April 13, 1965

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3,178,063

LINERS

Filed July 25, 1962

2 Sheets-Sheet 1

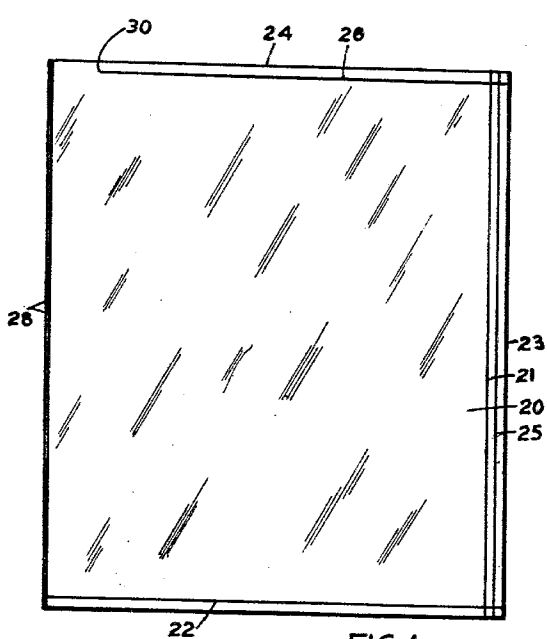


FIG. 1

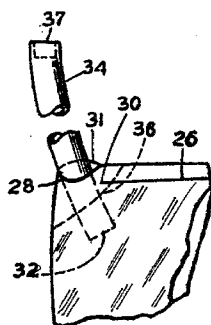


FIG. 2

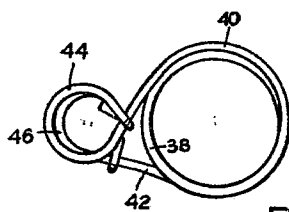


FIG. 3

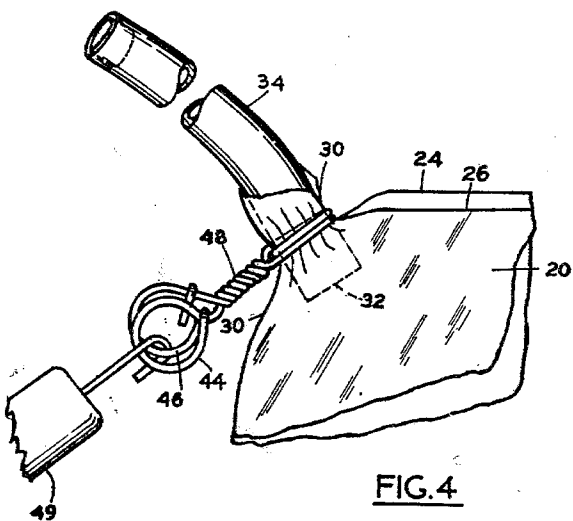


FIG. 4

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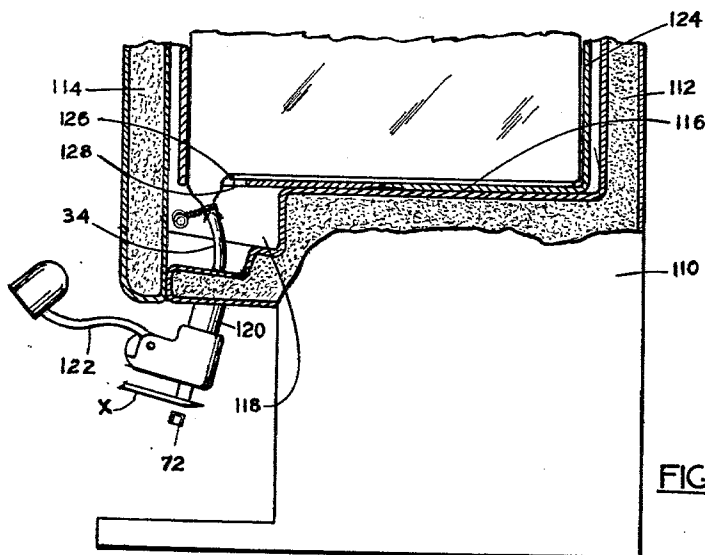
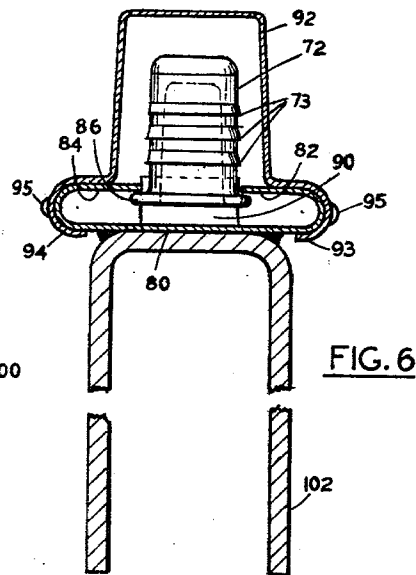
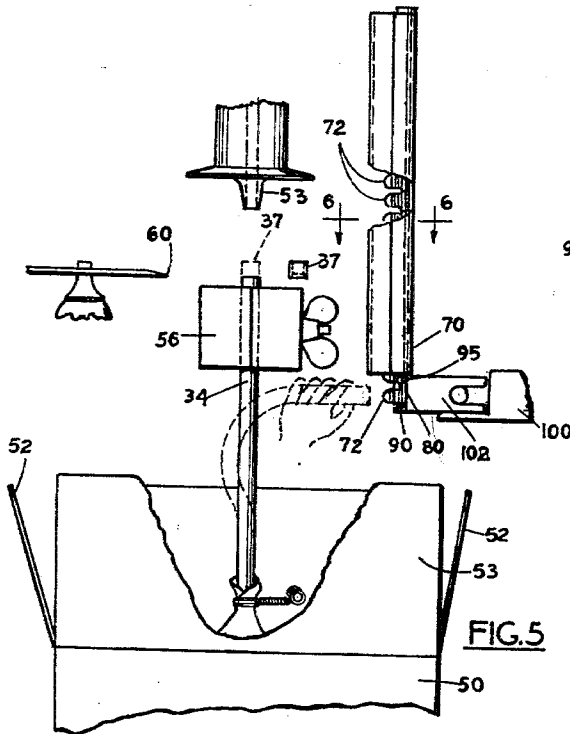
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2 Sheets-Sheet 2



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3,178,063

LINERS

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5 Claims. (Cl. 222-185)

This invention relates to liquid dispensing and shipping packages, and more particularly to a package comprising a thin plastic bag or liner disposed in a relatively rigid sustaining container, both of which are adapted to be discarded after a single use.

The container may be a corrugated fiber board box or carton of rectangular or square configuration, with such minor adaptations as are desirable to facilitate filling, packaging and dispensing. The liner comprises a bag of thin plastic sheet material of greater girth and length than the carton, and having a filling and dispensing hose. The bag is adapted to be completely deflated immediately prior to filling by subjecting the bag to subatmospheric pressure through its filler tube. The bag when filled by liquid delivered through the tube under pressure, becomes a liner and rests against and is supported within and by the walls of the container. The same filler tube acts as a dispensing tube upon inversion of the package.

The main features of the present invention lie in the bag construction and the attachment of the filling and dispensing tube thereto and the sanitary procedures employed in connection therewith. The bag may be formed from thin walled flexible tubular sheet polyethylene, or may comprise several plies of such material. The bag may likewise be formed of sheet material folded over and formed into a tube by a single side seam, which may be heat formed. It may be formed of a tubular member having no longitudinal seam, about which an outer member is folded and sealed along one side edge. The bottom of the bag is sealed by a seam extending clear across. The top of the bag is partially closed off by a heat seal extending from the side edge having a seam to a point adjacent the other, leaving an opening for the insertion of a dispensing tube. One end of a dispensing tube is inserted into the opening, the material of the bag adjacent the opening is gathered, and a wire tie in the form of two helical convolutions is applied, to bind the gathered material tightly against the tube end, the wire ends being twisted to apply the desired pressure. The seam across the top is bound in with the gathered material, and the filler and dispensing tube attachment to the bag as thus established provides a leak tight connection. The other end of the tube having been plugged or otherwise sealed.

In flexible liners or bags heretofore employed, a fitting or grommet has been welded or otherwise secured to the bag. Filling has been usually effected through the fitting, without benefit of any tube. The bags are prepared and shipped open to the place for filling. After filling through the fitting, a hose has been attached by the use of complemental fittings, or by direct attachment by friction alone to the welded fitting. Such procedure has certain disadvantages; the bag is shipped in an unsealed, open condition, and subject to likely contamination from air bound bacteria; excessive manual effort and dexterity is required in the filling and subsequent attachment of the hose; the hazard of contamination by manual contact with the surfaces ultimately brought into contact with the milk is present; and there is the chance of leakage through imperfection of or failure to properly apply the fittings. The tube, attached only by friction, can fall off.

It is accordingly an object of the present invention to avoid the disadvantages set forth, by providing a liner or bag with a tube attached in such manner as to be com-

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pletely sanitary, leak proof, and incapable of mechanical detachment.

It is another object of the invention to provide a bag with a dispensing tube sealed at one end, which when attached to the bag at the point of manufacture, seals the bag, the bags as thus assembled being capable of preparation under controlled sanitary conditions, which obtain until the tube seal is automatically or otherwise broken just prior to filling.

It is a further object of the invention to provide a bag with a tube and seal, wherein the bag may be filled through the tube upon removal of the seal, and the same tube resealed and employed subsequently for dispensing without loss of sanitation.

It is still a further object of the invention to provide a bag and tube for filling, together with means for resealing after filling, which is sterile and sanitary, and available immediately at the place of filling for immediate resealing.

The above and other novel feature and objects of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings, wherein like reference characters indicate like parts:

FIGURE 1 is a side elevational view of a bag prepared for application of a tube thereto;

FIGURE 2 is a fragmentary enlarged view of the corner opening in said bag expanded, with a tube end disposed therein in position preparatory to banding the bag corner about the tube end;

FIGURE 3 is a plan view of a preformed wire tie employed in banding;

FIGURE 4 is a fragmentary view of the corner of a bag with a sealed tube banded thereto;

FIGURE 5 is a diagrammatic view of apparatus employed in filling;

FIGURE 6 is an enlarged cross sectional view of the magazine taken on the line 6-6, of FIGURE 5, and

FIGURE 7 is a sectional view of a carton and liner in a dispensing apparatus, with its tube in position, the resealed end of the dispensing tube having been cut off preparatory to dispensing.

Referring to the drawings, there is shown in FIGURE 1 a rectangular bag 20 of tubular two ply thin sheet material such as transparent polyethylene. The two ply bag is provided with a seal 22 extending clear across one end, and a seal extending across the other end 24 as at 26, but terminating short of the folds 28 of the two plies, as at 30, by an amount sufficient to permit the easy insertion of the end of a filling and dispensing tube. The bag may comprise a tubular inner ply 21 and an outer ply 23 folded thereover as at 28 and heat sealed as at 25 along the opposite side edge.

As shown in FIGURE 2, the portion of the polyethylene bag left unsealed by the heat seal 26, is bulged between the folds 28 and seal end 30 as at 31 to permit the insertion of the end 32 of a sanitized flexible fill and dispensing tube 34. Upon insertion of the tube end, the material is gathered around the tube end approximately along the dotted line 36, which, will be seen as extending across the seal 26 back of the end 30 thereof, preparatory to banding with a wire tie. The tube end is suitably reinforced by an internal sleeve or other means to prevent collapse on banding, and the outer end is provided with a plug 37, or is heat sealed in the case of a thermoplastic tube.

The wire tie preferably employed is preformed as is

shown in FIGURE 3 and has one complete convolution 38, and partial convolutions 40 and 42 terminating in end loops 44 and 46. The diameter of the convolutions is such as to freely thread upon the tube 34 and the bag material gathered thereabout, so as to be placed in the approximate location of the dotted line 36. The convolutions are contracted and drawn tight about the gathered bag material, compressing the same tightly into the relatively soft rubber of the wall of the tube 34, by twisting the ends as at 48. A twisting tool 49 hooked into the loops 44 and 46 may be employed.

The inner ply of the bag being tubular may constitute a flat section cut from a length of tubing fresh from the extrusion process, during which process the inner surfaces are free from being subjected to any contaminating air. The tubes 34, may be sterilized and plugged as at 37. The insertion of the tube end into the opening 31, prior to binding is effected without exposure of the inner bag or the hose bore to any contamination. The bags as thus provided with a hose, may be manufactured at a central source, under sanitary conditions, and being sealed from the time of attachment of the hose and binding, will remain sanitary.

Such liners are adapted to be placed within a shipping container, in the form of a box of corrugated fiber board and then filled through the tube. As shown in FIGURE 5, the liner is loosely placed within a container 50, with its upper flaps, 51, 52 and 53 open. The internal girth and height of the container 50 are less than the perimetral dimension and length of the bag. The free end of the tube is then secured in a clamp 56 disposed above the box, in alignment with a fill nozzle 58 of a filling apparatus such as disclosed in copending application Serial No. 3,344 filed January 19, 1960, now issued as Patent No. 3,108,901. The plugged end and plug 37 of the tube 34, is disposed wholly above the clamp, and just before filling, the plug and tube end may be severed from the clamped portion thereof as indicated, by a sanitary swing blade such as 60. The nozzle is then lowered into the open end of the tube in sealing coupling relation. The nozzle is then connected to a suction line to evacuate as much air as possible from the tube, and any air in the bag, following which the nozzle is coupled to a source of liquid such as milk, under pressure, and the bag filled. The bag fills out against the box wall, and being of a greater perimetral dimension, becomes a liner free from stress. When the bag has been filled to nearly the capacity of the box, by flow of a predetermined quantity of liquid into the bag, the flow is stopped, the nozzle is removed from the tube end, the tube removed from the clamp, and the free end is promptly resealed by the insertion of a new sterile plug.

Conveniently disposed in relation to the tube clamp and fill nozzle is a plug magazine 70 in the form of a chute, having exposed at the lower end thereof a single plastic plug 72 disposed in a laterally projecting position and in readiness for the operator to force the open end of the tube, as removed from the clamp, directly over the plug. The operator upon removal of the tube from the clamp has the body portion of the tube in his grasp and forces the end of the tube which distends slightly over the projecting plug. The plug, being somewhat elastic, and once seated within the tube end, has flanges which are readily distorted sufficiently for removal from the magazine by the operator flexing the tube. The operator thus neither handles the plug nor the tube end. The carton flaps may thereupon be folded closed, with the sealed tube suitably disposed within, and the package sealed and made ready for shipment, which if milk, would be effected under refrigerated conditions.

The magazine referred to comprises a wide C-shaped channel member 80, the inbent side flanges 82 and 84 of which are spaced to nicely but releasably grip the end flange 86 of the plug. A series of such plugs are slidably disposed along the length of the channel member, and

the lower end of the channel member has a bent lip 90 acting as a stop to engage the flange of the lower most plug to hold the plug in the position heretofore described. The magazine or chute may have a channel shaped cover 92, having facing channel like edges 93 and 94 adapted to slide or snap over the inbent side flanges 82 and 84 of the channel 80, the cover being disposed to leave the lowermost plug exposed in the manner set forth. Small ball like bosses 95 are provided on opposite sides of the channel 80 to limit the location of the chute cover so as to expose the lowermost plug.

The chute may be detachably supported on any suitable support 100, as by the bifurcated bracket 102 secured to the channel 80. In practice the chute is filled with plugs, the cover applied, and the whole dipped in sanitizing solution before being mounted upon the support 100 in readiness for gravity feed of one plug at a time into position for application of a tube end thereto. The chute will be mounted adjacent to the filler nozzle, so that the lower most plug in the chute is within easy range of the fill tube, after removal from the filler nozzle clamp. It will be seen that the chute with its cover protects the supply of plugs from exposure whereby the sanitizing thereof, will remain effective for such length of time as is normally required to consume a magazine supply of such plugs.

The plugs 72 as shown in FIGURE 6 are hollow and of plastic and may have one or more external annular conical ribs 73 to additionally grip the internal wall of the tube end, and to provide for easy insertion into the rubber tube end while resisting subsequent removal therefrom.

The package so formed after shipment to its ultimate point where dispensing is desired, may be placed within a refrigerated dispenser, such as is indicated in section in FIGURE 7. The dispenser 110, comprises a cabinet having heat insulated walls 112, and an access door 114, and an internal shelf 116, relieved forwardly as at 118. A hollow fitting 120 with a pinch valve 122 extends from the lower end of the relieved portion 118.

A filled package 124 has portions of its inner flaps removed as at 126 and a removable portion in an outer flap to provide an opening 128 through which the tube may be reached and the plugged resealed tube end withdrawn. When the tube is withdrawn, the package is inverted, and placed on the shelf. The tube is then threaded through the bore of the fitting 120 of the pinch valve, with the valve open. The valve is then closed to pinch the tube closed, and the lower exposed end of the tube with the reseat plug 72 is cut off with a sanitary knife, or fresh razor blade X. The package contents are thus ready for dispensing, under the control of the pinch valve.

A container suitable for the purpose is disclosed in an application of Harold W. Layne being filed herewith, Serial No. 212,291 filed July 25, 1962, and may have a square cross-section and rectangular end flaps which meet upon the center lines of the container. The inside side flaps may have a small corner section removed therefrom at the forward corners thereof to provide an opening having a rounded V configuration, and the outer front flap may be provided with a readily removable section defined by a frangible perforate outline. Such a section will be larger than the inner flap opening referred to, and overlie the same. In practice, when the flaps are closed after filling, the inside flaps may be depressed into the carton, and the tube with its attachment end of the bag, may be disposed between the inner depressed flaps and the outer flaps. The removable section of the outer flap will be large enough for manipulating the free end of the tube from within the package and the adjacent portion of the liner, which then depends funnel like from the package.

From the foregoing, it will be seen that a completely sanitary system and sequence of operations are provided for, which permits bags and tubes to be assembled eco-

nominally in quantity at a manufacturing source where sanitation is completely controlled. The sealed bags are then distributed in lesser quantity to the various sources of supply of milk or other liquid, together with containers. The liner with the sealed tube end is placed in a container, the sealed tube end cut off for filling, thereafter resealed, and the completed filled packages are then ready for distribution to points where dispensing is required. Sanitation is thus assured from the time of assembly of the sanitary bags with sanitized tubes, the shipment thereof to filling locations, the filling thereof and to the time when the contents of the package has been completely dispensed, it being understood that during dispensing, the liner collapses within the container on withdrawal of liquid therefrom, so that no air ever enters the bag from assembly to discard following dispensing of the contents.

While the invention has been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. The method of filling and sealing a sanitary liner having a filling tube sealed at its outer end, said liner being disposed in a supporting container of less capacity than the liner, which comprises severing the sealed end of the tube, coupling the tube to a nozzle, evacuating air from the tube and liner through said nozzle, and subsequently filling the liner through said nozzle and tube with a predetermined quantity of liquid supplied to the nozzle under pressure to cause the liner to fill out into supporting relation with the walls of the supporting container, and subsequently sealing the tube end by manual projection of the tube end over a sanitized plug held by its end in a sanitized magazine.

2. The method of preparing packages filled with liquid which comprises sealing a tubular section of thin walled plastic material across one end, and partially sealing the other end to provide an opening for a tube, inserting one end of a section of sanitary tubing plugged at the other end into the opening, gathering the material including a portion of the partial seal about the tube and sealing the tube and section by binding the gathered material upon the tube to form a sealed sanitary bag liner with a filling and dispensing tube, placing said liner in a supporting container of less volume than the capacity of the liner, severing the seal thereof, subjecting the tube and liner to sub-atmospheric pressure, thereafter delivering a predetermined quantity of liquid under pressure to the liner through the tube to cause the liner to fill out into supporting relation with the walls of the supporting container, and thereafter plugging the tube end by manual application of the tube end to a sanitized plug held by its end in a sanitized magazine.

3. A liner for a rigid supporting container for holding liquids comprising a bag of liquid tight, flexible plastic sheet material comprising two plies of sheet material and in which the inner ply is of tubular seamless material and the outer ply comprises a sheet of material folded over the inner ply and sealed along one side edge, said bag having a seal extending from one side to a point adjacent the other side providing an opening, a dispensing tube having an end extending through the opening and a wire

tie comprising two convolutions gathering the liner about said end, and embracing said seal, and said tube having a sealed tube end, wherein the tube end seal is capable of being removed for filling, and wherein the tube end is capable of being resealed after filling.

4. A package for liquids comprising a substantially rigid container having a liner comprising a bag of liquid tight, flexible plastic sheet material, said bag having a seal extending from one side to a point adjacent the other side providing an opening, a dispensing tube having an end extending through the opening and a wire tie comprising two convolutions gathering the liner about said end, and embracing said seal, and said tube having a sealed tube end, wherein the tube end seal is capable of being removed for filling, and wherein the tube end is capable of being resealed after filling, the perimetral dimension of the liner being in excess of the internal perimetral dimension of the container, the length of the liner being greater than the length of the container so that when the liner is full, it bears against the lower container wall without stress, said container having a dispensing aperture in one end wall centrally of and adjacent the front of the container, said aperture being of a size several times the diameter of said tube, whereby upon inversion of the package, the portion of the liner adjacent the tie bulges funnel like through the aperture so that the dispensing tube including the portion inward of the tie is wholly below the container end wall, and the remainder of the bag is supported by the container end wall.

5. A package for liquids comprising a substantially rigid supporting container having a liner comprising a bag of liquid tight, flexible plastic sheet material comprising two plies of sheet material and in which the inner ply is of tubular seamless material and the outer ply comprises a sheet of material folded over the inner ply and sealed along one side edge, said bag having a seal extending from one side to a point adjacent the other side providing an opening, a dispensing tube having an end extending through the opening and a wire tie comprising two convolutions gathering the liner about said end, and embracing said seal, and said tube having a sealed tube end, wherein the tube end seal is capable of being removed for filling, and wherein the tube end is capable of being resealed after filling, the perimetral dimension of the liner being in excess of the internal perimetral dimension of the container, the length of the liner being greater than the length of the container so that when the liner is full, it bears against the lower container walls without stress, said container having a dispensing aperture in one end wall centrally of and adjacent the front of the container, said aperture being of a size several times the diameter of said tube, whereby upon inversion of the package, the portion of the liner adjacent the tie bulges funnel like through the aperture so that the dispensing tube including the portion inward of the tie is wholly below the container end wall, and the remainder of the bag end is supported by the container end wall.

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LOUIS J. DEMBO, *Primary Examiner*.