

March 15, 1966

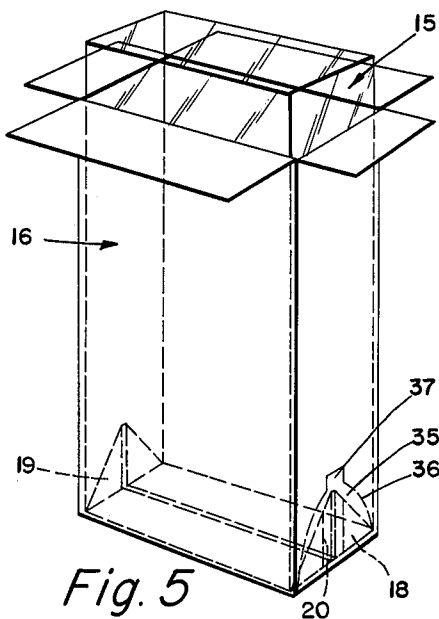
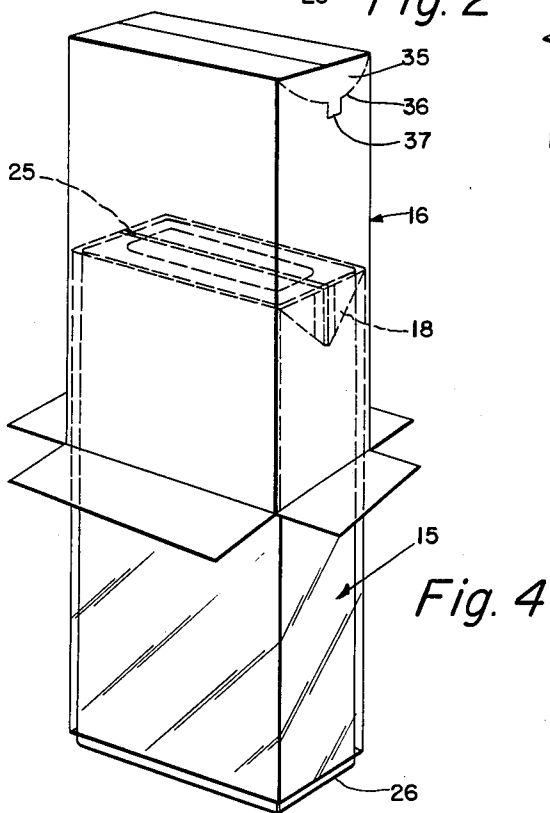
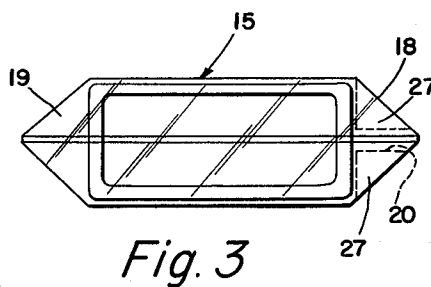
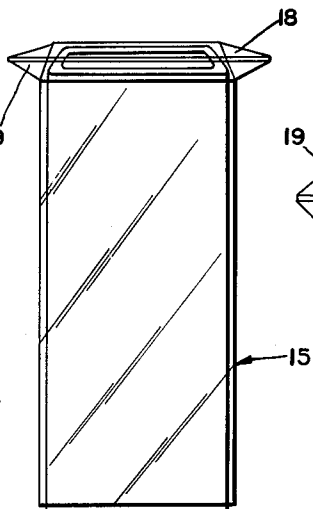
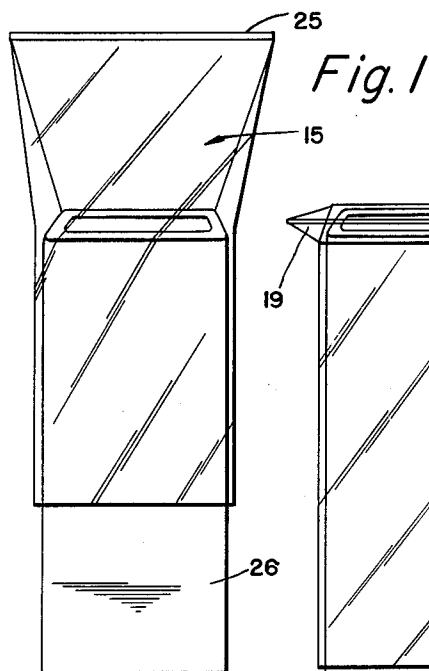
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3,240,416

LINED DISPENSING CARTON

Filed Jan. 12, 1961

2 Sheets-Sheet 1



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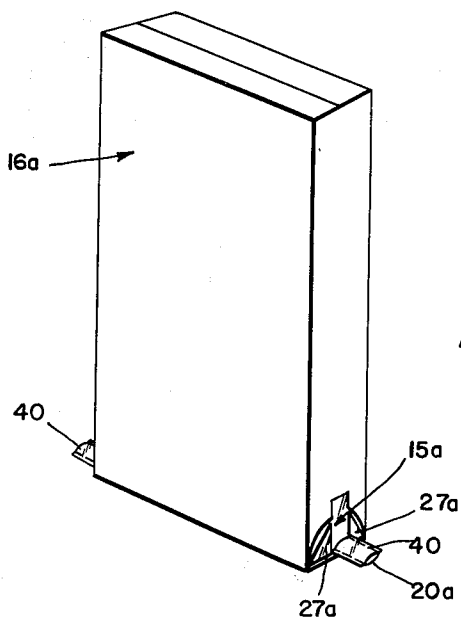
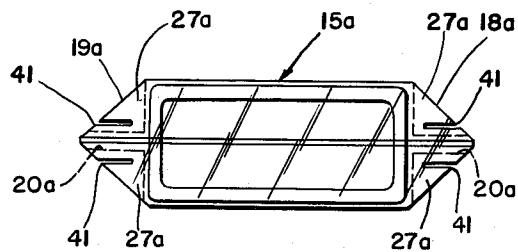
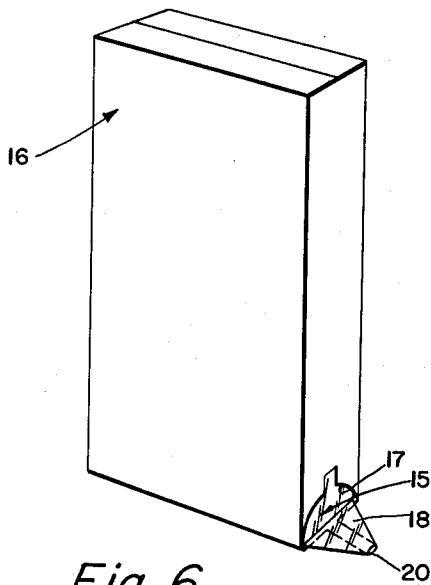
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LINED DISPENSING CARTON

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2 Sheets-Sheet 2



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3,240,416

LINED DISPENSING CARTON

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The present invention relates generally to the manufacture of dispensing cartons adapted for packaging and dispensing of flowable materials, and more specifically to a dispensing carton having an integral pouring spout for effective discharge of the contents of the container in an improved manner.

In forming a lined carton with either a separate liner sheet or bag to seal the contents for leakage, the sealing and folding of the liner during the closure of the end flaps of the carton leave triangular portions of the liner which are usually folded under the flaps. It is conventional to provide the top flaps with perforations which permit the top closure to be partly opened so that a filled-in portion of the liner can be lifted out and its sealed corner snipped off so that it can then function as a conical pouring spout through which the contents can be discharged by tilting or tipping the container, flow being stopped by setting the carton upright. This type of carton has been proposed for relatively small quantities of materials sold for household use and can be perfectly satisfactory for such quantities. There is a substantial need, however, for cartons which can be used as replaceable cartridges in dispensing fixtures and supplies and to which the dispensing valves or cocks may be readily and securely attached. For example, it is customary in restaurants and the like to dispense milk or cream from large dispensing fixtures and equipment having a storage tank filled with relatively large quantities of milk or cream. Sanitation codes and good practice require that such fixtures, including the tank, be frequently sterilized. It has long been appreciated that the time and labor involved in filling the tanks from the containers in which the milk or cream is received and the sterilization of the dispensing fixtures could be eliminated or greatly reduced if the containers in which the milk or cream is received could be simply used as replacement cartridges, the contents having been packaged in a clean and sterile condition. Unfortunately, there has not been available an economical package which could be used as such a replacement cartridge and which permitted a safe, reliable, and simple connection between the package and the dispensing valve or cock of the dispensing fixture. Threaded or clamped connections to the openings of rigid shipping containers for the milk or cream, such as metal cans or glass jars or jugs were not satisfactory because of the need for means to provide access of air into the interior of the package as its contents were withdrawn. No serious consideration could be given to packaging in lined cartons provided with integral conical spouts, as described above because of the difficulty of making a satisfactory connection with the spouts, let alone the problem of spillage involved if the packages were inverted to permit flow through the spout normally located at the top of the package.

A primary object of this invention is to provide a dispensing carton with an improved pouring tube, rather than a conical spout, from which the contents of the carton can be discharged.

Another object of this invention is to provide a lined carton provided with a cylindrical tubular pouring spout or opening which is not necessarily associated with the end or bottom closure flaps of the carton. It is an advantage of this invention that the tubular dispensing spout may be

withdrawn from a side of the carton at the bottom so as to permit discharge from the carton without tilting. This is a particular advantage when the carton is used to package relatively larger or heavy quantities and when the carton is used as a replaceable cartridge in dispensing fixtures and equipment, such as, for example, milk and cream dispensers in restaurants and the like. The cylindrical tubular spout permits its ready attachment to valves or cocks in dispensing fixtures or to valves which may be used at attachments to the carton itself.

Another object of the invention is to provide a dispensing carton of the character specified having a novel construction which lends itself to economical production-line methods of manufacture. A still further object of the invention is to provide a method of manufacturing a dispensing carton having the advantageous features described above.

Other objects and advantages of the invention will become apparent from the following detailed description and accompanying drawings.

In the drawings:

FIGURES 1 and 2 are side elevational views showing successive steps in the manufacture of the liner component of the present carton prior to the formation of the dispensing spout;

FIGURE 3 is a view of the assembly shown in FIG. 2 and further illustrates how the uniform dispensing passage is formed in a triangular end portion of the liner or bag;

FIGURES 4 and 5 are perspective views illustrating successive steps in assembling the liner or bag within an outer container to form the completed carton of the invention;

FIGURE 6 is a perspective view showing one embodiment of the invention with the dispensing spout exposed for use;

FIGURE 7 is a view similar to FIG. 3 but illustrating a modified procedure for forming the dispensing spout;

FIGURE 8 is a perspective view showing another embodiment of the carton of the invention which is provided with a tubular dispensing spout formed in accordance with the procedure shown in FIG. 7.

In general, the foregoing objectives and advantages are attained by providing the carton with an inner, liquid-impervious bag or liner which is constructed to have a laterally projecting, flexible extension at one end. This extension is formed to have a tubular passage of uniform diameter communicating with the interior of the bag. During shipment and handling of the carton, the flexible extension may be folded against the side of the bag to lie within the outer shell of the carton. When in use, the extension is drawn outwardly through a contiguous opening in the carton shell so that the contents of the carton can discharge through the tubular passage.

Referring now to the drawings, and to FIGS. 5 and 6 in particular, the lined dispensing carton comprising the present invention is shown to include an inner liquid-impervious bag or liner 15 incased in an outer container 16 of relative heavy carton-forming material, such as cardboard, paper board, or the like. Corrugated paper board, having sufficient strength and rigidity to permit the formation of a carton with a capacity of five gallons or greater, is frequently employed.

The bag or liner 15 is formed with a novel pull-out pouring tube which is initially tucked within the container 16 to permit handling and shipment of the carton by conventional procedures, and which is thereafter extended through an opening 17 at one end of the container to permit dispensing of the contents of the carton at the bottom. As shown in FIG. 6, the pouring spout constitutes a triangular end portion 18 of the bag 15, the end portion 18 being formed by procedures hereinafter discussed in more detail to have a central passage 20 of

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uniform size in which a tubular connection to a valve or dispensing cock may readily be inserted and securely connected. Although a pouring spout has been shown on only one side of the carton, it is possible according to the present invention to provide pouring spouts at both sides to permit dispensing of the contents from either or both sides.

Preferably, the bag or liner 15 is formed of a flexible, heat-sealable material, such as polyethylene film or the like. Materials of this type lend themselves to the efficient and relative inexpensive process of the invention, according to which the liquid-impervious liner 15 and the integral pouring spout may be readily formed from a standard leakproof, flat bag construction by production-line methods.

In accordance with the preferred method of manufacture, the bag or liner 15 is formed by severing a section of appropriate length from an extruded tube of polyethylene film or similar material and simultaneously heat-sealing the severed section across one end to form a flat bag construction having a closed end 25. As shown in FIGS. 1 and 2, the sides of the flat bag are then stretched apart by axially moving a rectangular mandrel 26 through the open end of the bag until adjacent the closed end 25. This movement of the rectangular mandrel into the bag causes the closed end 25 to flatten out and form the triangular end portions 18 and 19 which extend laterally from the opposite side edges of the bag.

As noted above, one of the principal objects of the invention is to provide a dispensing carton with a pouring tube for effecting controlled flow of the contents of the carton in measured amounts. To this end, the triangular end portion 18 is heat-sealed in the areas generally designated by reference numeral 27 in FIG. 3 to form the uniform passage or channel 20 which extends from the tip of the end portion to the interior of the bag. As will be apparent to those skilled in the art, this heat-sealing operation may be automatically accomplished by providing a conventional heat-sealing apparatus with a pair of right angle sealing bars arranged with corresponding sides in parallel, spaced alignment. In the event it is desired to form the carton with a pouring spout on each side, the other triangular end portion 19 of the bag may be heat-sealed in the same manner as the portion 18 and in a simultaneous operation.

After either or both of the end portions 18 and 19 have been heat-sealed in the foregoing manner, the bag 15 and the mandrel 26 are inserted into the container 16, as illustrated in FIG. 4. This is accomplished by moving the closed end 25 of the bag into the open end of the container so that the triangular portions 18 and 19 are folded to be between the sides of the bag and the sides of the container. When the container and bag are thus assembled, the mandrel 26 is removed to leave the container and the bag in the condition shown in FIG. 5 in which they are ready for a filling operation which may be carried out by any conventional filling or weighing mechanism. In a final operation, the open end of the filled bag 15 is heat-sealed and the open end flaps of the container 16 are closed and sealed to complete the carton.

The outer container 16 may be made by any of the commercially available carton or package forming apparatus and therefore it is not necessary to discuss the details of its construction other than to specify that the container is provided with a tear-away section 35 overlying the triangular end portion of the bag where the channel 20 is located. As shown in FIGS 4 and 5, the tear-away section 35 is defined by perforations 36, and is of sufficient size to expose the underlying end portion of the bag when the section is removed. In order to facilitate the removal of the section, it may be provided on its upper edge with a tearing tab 37 which is defined by weakened lines in the container side wall and which may be readily broken away from the side wall by exerting inward pressure. It is to be understood, of course, that,

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if both triangular end portions of the bag are formed to have a pouring channel, the container 16 will be correspondingly formed with a tear-away section over each of the end portions.

The user of the dispensing carton comprising the present invention has merely to tear away the container section 35 to form the opening 17 from which triangular end portion 18 of the bag or liner 15 may be extracted, and then to remove the tip of the end portion to open the channel or passage 20. It will be observed that the uniform size of the passage 20 will result in controlled flow of the carton contents through the spout. If the spout is at the top of the carton, this controlled flow may be intermittently initiated and disrupted by simply tipping the carton, while gravity will effect the desired flow when the spout is at the bottom of the carton, as shown in FIG. 6. In this latter position of the spout, the flow may be interrupted by either manually pinching the passage 20 closed or by connecting the bag end portion 18 to suitable valves (not shown).

FIGS. 7 and 8 illustrate a modified form of the structure of the invention in which the pouring spout is a tube 40 instead of being a triangular extension with an internally formed channel. As shown in FIG. 8, the modified carton structure is formed with two of these tubular spouts, one at each side of the carton; however, it is to be understood that the carton may be formed with only one such spout and that it may be at the top or the bottom of either side.

The preferred method of manufacture of the modified carton is generally the same as that discussed in connection with the structure shown in FIG. 6, except that the triangular bag end portions 18a and 19a are formed with slits 41 parallel to and adjacent the sides of the passages 20a. These slits may be advantageously formed by providing the right angle heat-sealing bars used to heat-seal the areas 27a with parallel knife blades which will be effective to cut the slits simultaneously with the heat-sealing operation. Preferably, a suitable adhesive is then applied to the areas 27a so that they will adhere to the sides of the liner or bag 15a when the liner is assembled within the container 16a in the manner illustrated in FIG. 4.

The container 16a is provided with tear-out sections (not shown) similar to the sections 35 shown in FIGS. 4 and 5 so that at least the unsealed central passages 20a in the bag end portions 18a and 19a may be exposed when the carton is to be used. The liner or bag end portions containing the passages 20a may be then easily released and extended by virtue of the preformed slits 41 to form the tubular dispensing spouts 40.

Whether the lined cartons are formed with the tubular dispensing spouts 20 integral with the triangular end portions formed by the erection of the liner into a prismatic cross-section or with the dispensing tubes 40 separated by the slits 41 from such triangular end portions, either dispensing opening can be readily reclosed by simply pinching the ends of the tubular passages 20 or 40, if no dispensing cock or valve is employed. A tight and secure connection either with portable valves or to the valves or cocks of dispensing fixtures and equipment may be made by clamping the spout on an inserted more rigid tube leading to the valve or cock. If such inserted tube is slightly tapered so that the flexible and usually somewhat elastic film forming the passage of the spout 20 or 40 will be slightly stretched over the connecting tube as it is inserted, frequently no additional clamping means are needed to seal a spout 20 or 40 to the inserted connecting tube.

The same above-described sealing and self-clamping effect between the cylindrical tubular spout and a slightly tapered inserted connecting tube may also be obtained if the adjacent sides of the seals defining the spout passage are slightly divergent so as to define a passage having a circumference at the outer end of the passage which is

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slightly larger and a circumference at the inner end of the passage which is slightly smaller than a circumference of the connecting tube inserted in the passage. With such a divergent passage, the connecting tube is simply inserted until the tube is tightly fitted in the outwardly divergent spout passage.

The disclosed embodiments of this invention show the flexible film liner inserted as a bag in the supporting external carton. Such a separable liner is usually preferred for two reasons: First, it allows the triangular, tubular spout-forming portion to be folded readily against the sides of the encasing carton when the bag is inserted, whereby the spout may be pulled out from the sides without having to rupture the customary overlapped end flaps. Second, when a carton made according to this invention is used for packaging liquids to be dispensed through the spouts 20 or 40 located at the bottom of the carton, flow of the liquid will seldom be interrupted or slowed by a vacuum created within the carton, i.e., there will not be the customary gurgling and irregular flow which occurs when a liquid is dispensed from the bottom of an unvented rigid container, such as a glass jar or jug. Instead, the flexible liner bag will simply collapse as the liquid contents are withdrawn, thereby avoiding the need for venting the contents to secure constant flow and the consequent danger that relatively sterile contents may be contaminated or spoiled by exposure to air.

If the contents to be packaged are such that it is immaterial whether the liner is readily separable from the supporting carton walls, it should be clear that tubular dispensing spouts may be formed when the liner is in the form of a sheet attached to the inner wall of the carton blank and formed into a longitudinally seamed tube having extending end margins, the longitudinal seam usually being formed when the carton blank is folded into a flat tube and seamed at the side. When such sheet liners are employed, the end of one extending margin is sealed by a straight transverse end-closing seam. By drawing the end-closing seam toward the side walls of the carton, triangular extrusion similar to end portions 18 and 19 of the preferred embodiment will be formed and such triangular extrusions may then be sealed and/or slit to form tubular spouts similar to the spouts 20 and 40. In such cases it is also usually more convenient to fold the spouts under the end flaps of the carton, rather than between the liner and the carton walls, as in the preferred embodiment.

It is also to be understood that, when the dispensing spout is folded between the liner and a carton wall, it is not necessary that such wall be a side wall as in the disclosed preferred embodiments. So long as the liner extends beyond the end of the walls sufficiently to permit triangular or substantially triangular extensions corresponding to the extensions 18 and 19 of the preferred embodiment to be formed, passages with non-convergent sides (i.e., parallel or divergent) may be sealed in such triangular extensions to form tubular dispensing spouts, similar to either the spouts 20 or 40 of the disclosed embodiment. Thus, the location of the spout with respect to any given wall or portion of a wall is simply a matter of arranging the triangular extensions with respect to the wall or section where the spout is desired, regardless of whether the carton is of rectangular, circular, or other cross section.

As indicated above, flexible polyethylene film, of appropriate gauge, is usually the sheet material employed for the carbon liner and its integrally-formed dispensing spout. Other heat-sealable films may, of course, be employed when economical or when required by the character of the packaged contents; by way of example, such films may be other polyolefins, such as polypropylene; various cellulosic esters, such as cellulose acetate or cellulose butyrate; polystyrenes; polyvinyls, polyvinylidenes and their copolymers and mixed polymers and copolymers; and polyesters, such as polyethylene terephthalate.

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Further, the liner need not consist of film alone but may be suitably reinforced in whole or part (e.g., at the spout or otherwise in the area of the triangular extension in which the spout is formed) by lamination or coating on paper, foil, or other flexible sheet and web materials. The congruent areas of the extension which are sealed together to define the passage of the integral spout are usually fused together by heat-sealing because such sealing lends itself to production-line fabrication of the liner and its integral spout; this does not, however, exclude sealing of the congruent areas together by other means, as by adhesives or fusion by solvents and/or plasticizers.

Other modifications and variations of the invention obviously will be apparent to those skilled in the art in light of the above teachings. It is to be understood, therefore, that within the scope of the appended claims the invention may be practiced otherwise than as specifically disclosed.

What is claimed is:

1. A dispensing package comprising a relatively less flexible outer container, a relatively flexible leakproof liner incased in said container, and flowable contents contained within said liner, said liner being closed at both ends and having a portion of one closed end folded to provide an outwardly extendable portion of said liner communicating with the interior thereof, said outwardly extendable portion being confined, before discharge of said contents from the package, between said liner and said outer container, a relatively weakened portion of said outer container overlying said extendable portion of said liner, and adjacent sections of said outwardly extendable portion of said liner being sealed together to define, by the unsealed remainder of the portion, an outwardly non-convergent passage closed at its outer end but communicating with the interior of the package and permitting said passage to receive an inserted less flexible tube about which the passage may be sealed, whereby, when said weakened portion of the outer container is ruptured to provide an opening, at least the passage-containing section of the folded portion of the liner may extend therethrough and, upon opening the closed outer end of said passage, the contents of the package may be discharged therethrough, said container being provided with bottom and top closures and at least one side wall and the closed end of said liner having the said extendable portion adjacent the bottom closures, but the weakened portion of said containers is located in a side wall adjacent the bottom closure, whereby, when said package rests on said bottom closure, the flowable contents will discharge by gravity through said passage.

2. A dispensing package comprising a relatively less flexible counter container, a relatively flexible leakproof liner incased in said container, and flowable contents contained within said liner, said liner being closed at both ends and having a portion of one closed end folded to provide an outwardly extendable portion of said liner communicating with the interior thereof, said outwardly extendable portion being confined, before discharge of said contents from the package, between said liner and said outer container, a relatively weakened portion of said outer container overlying said extendable portion of said liner, and adjacent sections of said outwardly extendable portion of said liner being sealed together to provide, by the unsealed remainder of the portion, a passage closed at its outer end but communicating with the interior of the package, whereby, when said weakened portion of the outer container is ruptured to provide an opening, at least the passage-containing section of the folded portion of the liner may extend therethrough and, upon opening the closed outer end of said passage, the contents of the package may be discharged therethrough, said container being provided with bottom and top closures and at least one side wall and the closed end of said liner having the said extendable portion adjacent the bottom closures, but the weakened portion of

said containers is located in a side wall adjacent the bottom closure, whereby, when said package rests on said bottom closure, the flowable contents will discharge by gravity through said passage, and each sealed section of the outwardly extendable portions of said liner is slit to permit the outer end of said passage to be manipulated independently of the remainder of the outwardly extendable portion.

3. A liner for a dispensing package comprising a flexible sheet material in tubular form and foldable to a flat tube, a transverse closure closing one end of said tubular liner, a fold in the wall of said tubular liner spaced from said closure, said fold being re-entrant with respect to the outer surface of said liner in which it is formed and extending transversely to the length of said liner, and angular folds in said liner running from each end of said transverse fold and converging toward each other, said angular seams being re-entrant with respect to the inner surface of the liner in which they are formed, said transverse fold and said angular folds forming a substantially triangular outwardly extending folded extension of said liner having a closed apex but communicating within the interior of said liner across the base of said triangular extension, adjacent congruent inner surfaces of sections of said liner extension being sealed together to define a passage extending from the interior of said liner to said apex, said extension being foldable against the outer surface of said liner, whereby, when said liner is supported by an outer, relatively stiffer container with said extension being folded between said liner and said container opening of said container to permit said extension to be withdrawn from within said container and the normally closed apex thereof to be opened, flowable contents within said liner may be dispensed through the passageway of said extension, and in which at least the inner surface of said liner is of flexible, heat-sealable thermoplastic material, the bottom closure for said liner is a heat-sealed seam and the sealed congruent sections of said liner extension have been fused together by heat-sealing, and also in which the sealed congruent sections of said liner extensions are substantially triangular in form to define a substantially non-converging passage from the interior of said liner toward said apex.

4. A liner for a dispensing package comprising a flexible sheet material in tubular form and foldable to a flat tube, a transverse closure closing one end of said tubular liner, a fold in the wall of said tubular liner spaced from said closure, said fold being re-entrant with respect to the outer surface of said liner in which it is formed and extending transversely to the length of said liner, and angular folds in said liner running from each end of said transverse fold and converging toward each other, said angular seams being re-entrant with respect to the inner surface of the liner in which they are formed, said transverse fold and said angular folds forming a substantially triangular outwardly extending folded extension of said liner having a closed apex but communicating within the interior of said liner across the base of said triangular extension, adjacent congruent inner surfaces of sections of said liner extension being sealed together to define a passage extending from the interior of said liner to said apex, said extension being foldable against the outer surface of said liner, whereby, when said liner is supported by an outer, relatively stiffer container with said extension being folded between said liner and said container opening of said container to permit said extension to be withdrawn from within said container and the normally closed apex thereof to be opened, flowable contents within said liner may be dispensed through the passageway of said extension, and in which at least the inner surface of said liner is of flexible, heat-sealable thermoplastic material, the bottom closure for said liner is a heat-sealed seam and the sealed congruent sections of said liner extension have been fused together by heat-sealing, and also in which the sealed congruent sections of said liner extensions are substan-

tially triangular in form to define a substantially non-converging passage from the interior of said liner toward said apex, and the heat-sealed sections are slit along a line extending from the angular fold of said triangular extension toward the base thereof to provide a tubular spout manipulatable independently of the remainder of said extension.

5. A liner for a dispensing package comprising a flexible sheet material in tubular form and foldable to a flat tube, a transverse closure closing one end of said tubular liner, a fold in the wall of said tubular liner spaced from said closure, said fold being re-entrant with respect to the outer surface of said liner in which it is formed and extending transversely to the length of said liner, and angular folds in said liner running from each end of said transverse fold and converging toward each other, said angular seams being re-entrant with respect to the inner surface of the liner in which they are formed, said transverse fold and said angular folds forming a substantially triangular outwardly extending folded extension of said liner having a closed apex but communicating within the interior of said liner across the base of said triangular extension, adjacent congruent inner surfaces of sections of said liner extension being sealed together to define a passage extending from the interior of said liner to said apex, said extension being foldable against the outer surface of said liner, whereby, when said liner is supported by an outer, relatively stiffer container with said extension being folded between said liner and said container opening of said container to permit said extension to be withdrawn from within said container and the normally closed apex thereof to be opened, flowable contents within said liner may be dispensed through the passageway of said extension, and in which at least the inner surface of said liner is of flexible, heat-sealable thermoplastic material, the bottom closure for said liner is a heat-sealed seam and the sealed congruent sections of said liner extension have been fused together by heat-sealing, and also in which the sealed congruent sections of said liner extensions are a pair substantially triangular in form to define a substantially non-converging passage from the interior of said liner toward said apex.

6. A liner for a dispensing package comprising a flexible sheet material in tubular form and foldable to a flat tube, a transverse closure closing one end of said tubular liner, a fold in the wall of said tubular liner spaced from said closure, said fold being re-entrant with respect to the outer surface of said liner in which it is formed and extending transversely to the length of said liner, and angular folds in said liner running from each end of said transverse fold and converging toward each other, said angular seams being re-entrant with respect to the inner surface of the liner in which they are formed, said transverse fold and said angular folds forming a substantially triangular outwardly extending folded extension of said liner having a closed apex but communicating within the interior of said liner across the base of said triangular extension, adjacent congruent inner surfaces of sections of said liner extension being sealed together to define a passage extending from the interior of said liner to said apex, said extension being foldable against the outer surface of said liner, whereby, when said liner is supported by an outer, relatively stiffer container with said extension being folded between said liner and said container opening of said container to permit said extension to be withdrawn from within said container and the normally closed apex thereof to be opened, flowable contents within said liner may be dispensed through the passageway of said extension, and in which at least the inner surface of said liner is of flexible, heat-sealable thermoplastic material, the bottom closure for said liner is a heat-sealed seam and the sealed congruent sections of said liner extension have been fused together by heat-sealing, and also in which the sealed congruent sections of said liner extensions are a pair substantially triangular in form to define a substantially non-

converging passage from the interior of said liner toward said apex, and each of the sealed congruent sections of said liner extensions is slit from the outer angular fold toward the base to provide a central passage in said extension manipulatable independently of the remainder of the extension. 5

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