

- [54] CARTRIDGE TYPE DISPENSER WITH RESILIENT SLITTED OUTLET VALVE
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- [51] Int. Cl. **G01f 11/00**
- [58] Field of Search **222/326, 327, 387, 389, 222/390, 391, 490, 494; 137/525.1, 525.3**

[56] **References Cited**

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2,111,582	3/1938	Crewe.....	222/541 X
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[57] **ABSTRACT**

Disposable package comprising a filled temporarily sealed cartridge for use in a dispensing gun similar to a caulking gun for repeated discharge of increments of the contents. Disclosed embodiment is for use in fast-service food outlets in dispensing of uniform increments of semisolid materials such as salad dressing having consistency substantially that of mayonnaise. Cartridge includes a cylindrical body, a follower or extruding plug and a head having a dispensing nozzle especially designed for rapid discharge of such material at low velocity irrespective of wide variations in force or speed of stroke which may be applied by different persons to trigger of dispensing gun. Nozzle will not permit dribbling of contents between discharge strokes because in absence of pressure on contents orifice of nozzle is limited in shape and area. Nozzle orifice defined by pliable petal-like blades which open as rapidly as required under varying degrees of pressure to define temporary orifice of larger area through which contents can only emerge at low velocity. Nozzle is recessed in umbilication formed in head of cartridge so nozzle and contents may be covered by removable seal prior to use and also to protect nozzle against contact with any object during use. Follower plug is shaped to nest with interior of head assuring ultimate discharge of substantially all of contents and plug and head are sufficiently rigid to preclude pumping of contents between discharge strokes.

20 Claims, 9 Drawing Figures

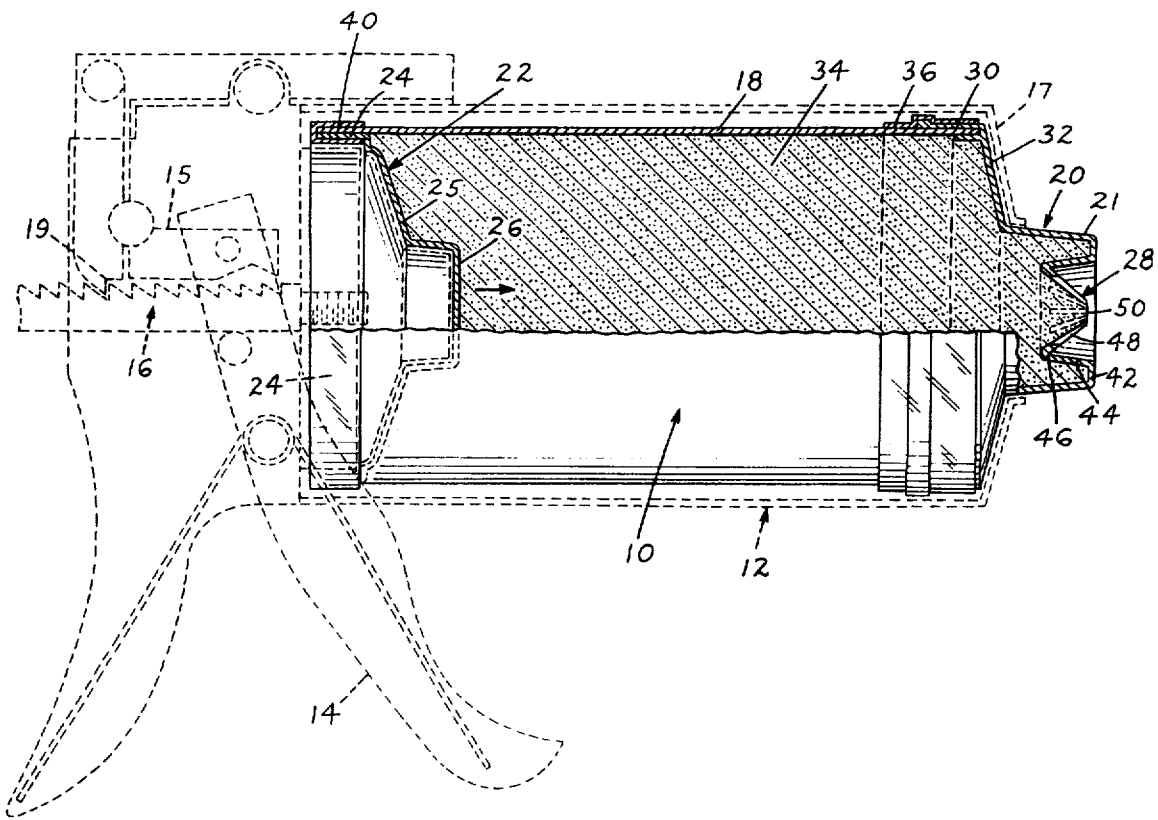


FIG. 3.

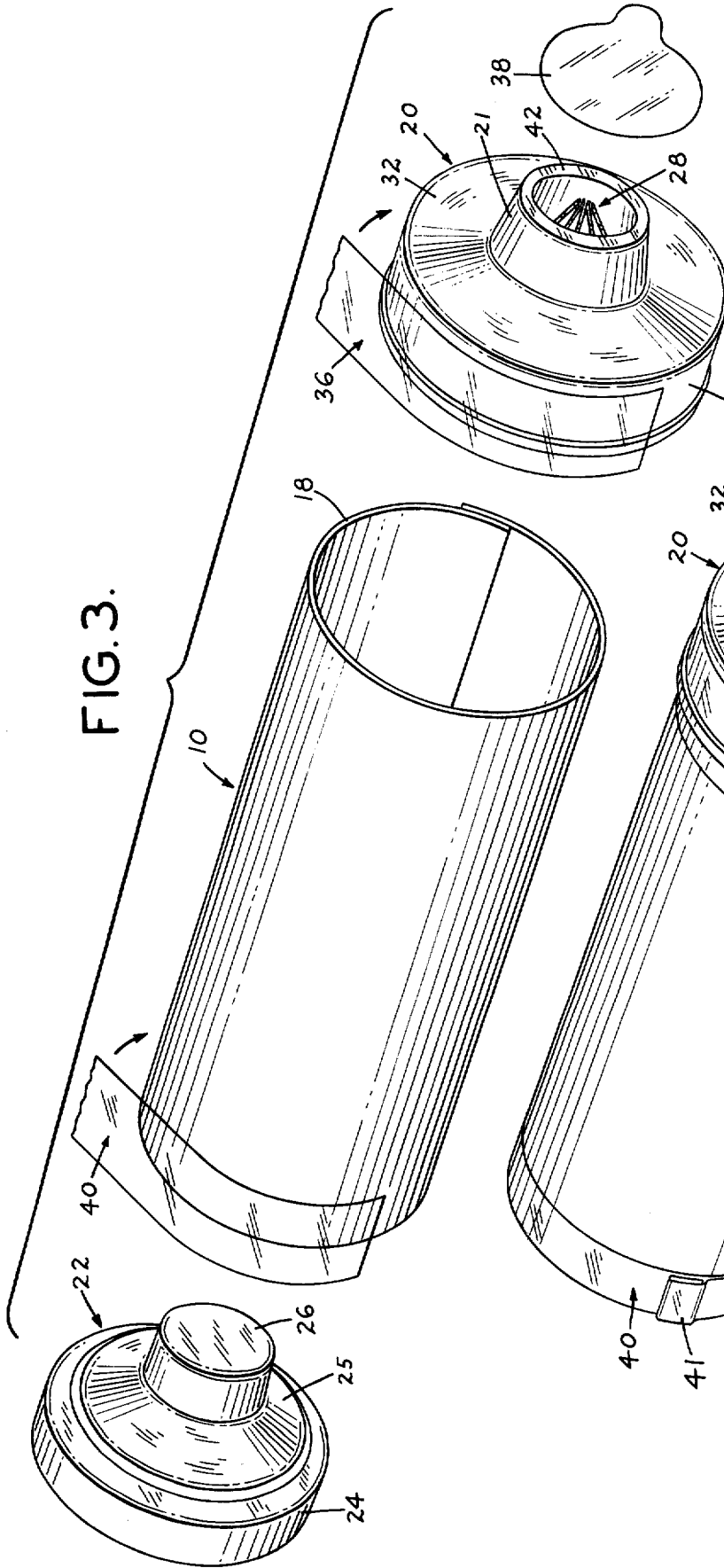


FIG. 4A.

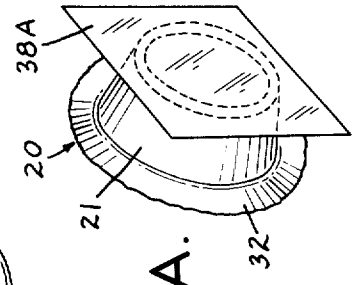


FIG. 4.

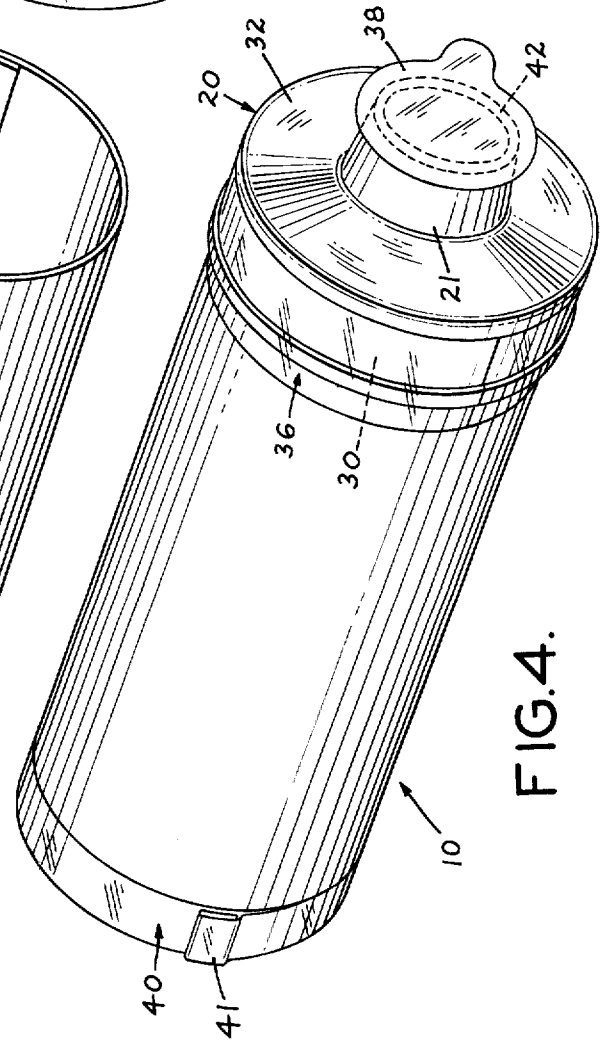


FIG. 5.

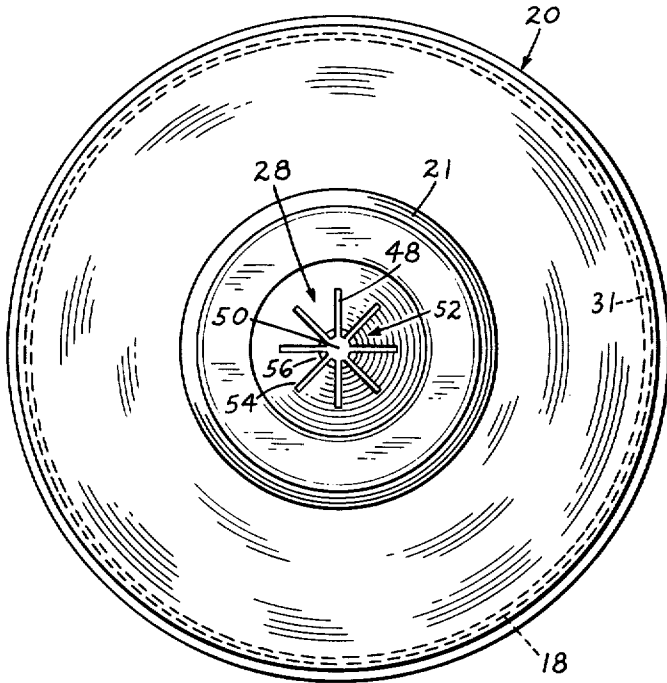


FIG. 6.

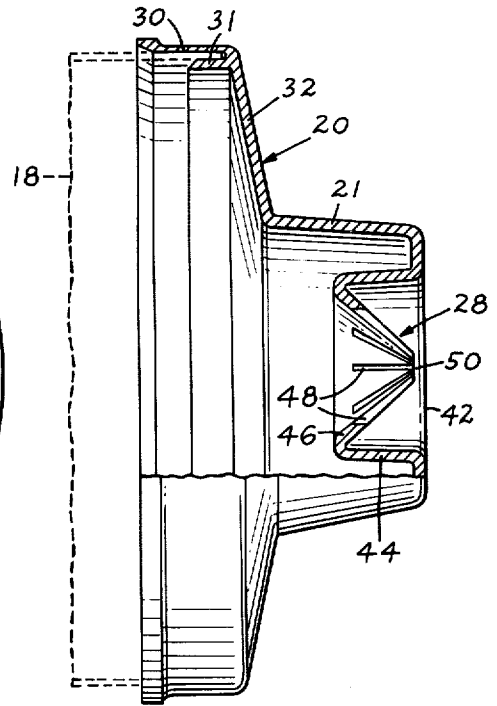


FIG. 7.

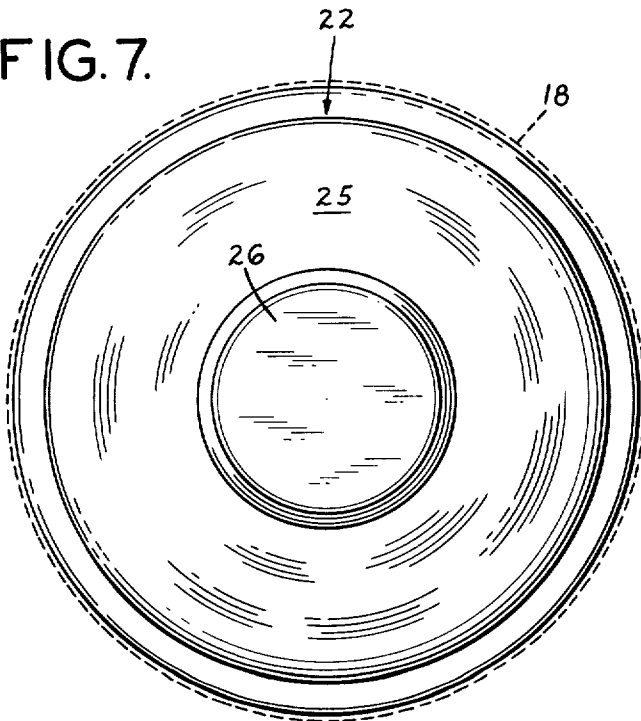
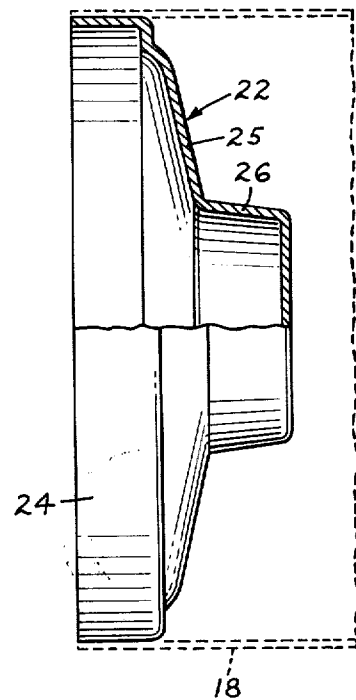


FIG. 8.



CARTRIDGE TYPE DISPENSER WITH RESILIENT SLITTED OUTLET VALVE

BACKGROUND

Apparatus in use in one chain of fast-service food outlets for dispensing of salad dressing comprises a trigger-actuated gun for discharging an accurately measured incremental quantity of dressing on each single stroke of gun. The gun includes a reusable cylindrical container in which a piston works. A nozzle is attached to container and comprises a fragile flat membrane of elastomeric material with cross-hair cuts. Container, piston and nozzle must be disassembled and should be cleaned each time the container is emptied and the container then must be refilled from a bulk supply. Economic as well as sanitary considerations make this procedure undesirable.

It has become quite customary in connection with caulking guns, put to their originally-intended use, to supply caulking compound in disposable cartridges which remain sealed until placed in the gun. In some instances the nozzle constitutes a permanent part of the gun and accordingly may have to be cleaned out after each use. In other instances a nozzle comes with or is formed as a part of the disposable cartridge. In either event the nozzle usually is merely a tube having an inside diameter chosen to lay a bead of whatever diameter may be desired. Caulking compounds characteristically are heavy viscous materials which exhibit little, if any, tendency to exude from such nozzles in the absence of the considerable pressure which is exerted on the contents of the cartridge when extrusion of the compound is desired.

Mayonnaise, by definition, is a semisolid dressing made by emulsifying a mixture of raw eggs or egg yolks, vegetable oil and vinegar or lemon juice. With the addition of salt and condiments it is used as a salad dressing or as a base for mixture with compatible materials to form salad dressings identified by various names. The consistency of mayonnaise, or mayonnaise-based salad dressings or of dressings made in imitation thereof, is light and it will extrude through a small orifice at very high velocity under very moderate pressure. Accordingly when it is desired to extrude such material by means such as a caulking gun a nozzle having an orifice of large effective diameter is required if excessive velocity is to be avoided. However, an orifice of appropriately large fixed cross-sectional area is impractical since the material usually will flow through such an orifice by gravity alone or by inertial forces incident to handling. It is for this reason that the flattened tube of elastomeric material has been used in the past to provide a nozzle which will expand and afford a large orifice only under discharge pressure.

In U.S. Pat. No. 3,273,760 a cartridge-like container with expelling means for food products is disclosed wherein a flattened pliable dispensing nipple is provided for extruding the contents directly into the mouth of the consumer. This patent also shows, in certain modifications thereof, an extruding plunger which roughly nests with the head to minimize the amount of food product remaining in the package after a full stroke of the plunger. The dispensing nipple is not formed as an integral part of the cartridge and must be applied by the user after the cartridge has been opened.

U.S. Pat. No. 2,661,126 discloses a plunger-actuated dispensing container for viscous fluids such as printing

ink. The orifice is relatively large but fixed in area whereby a removable closure must be removed and replaced incident to each use.

U.S. Pat. Nos. 2,102,939, 2,111,582; 2,478,078; 3,130,872; 3,288,333 and 3,319,841 are illustrative of cartridge type caulking guns with nozzles of various types including some which are formed as a part of the gun and others which are formed as a part of the cartridge.

The prior art also includes many well-known forms of cake or candy decorating devices which include nozzles for extruding paste material to form rosettes, gadroon edging and the like. A widely used nozzle for this purpose has a star-shaped orifice somewhat resembling the orifice disclosed in this application. However, so far as known, such nozzles are made of rigid material wherein the shape of the orifices remains unchanged under varying amounts of extruding pressure since the purpose of the nozzle is to form an extrusion having a definite cross-sectional shape.

BRIEF DESCRIPTION OF THE INVENTION

The invention provides a disposable cartridge type dispensing package especially suitable for the packaging and shipping of materials such as salad dressing to the retail outlets of quick-service food vendors where dispensing guns are used to rapidly and accurately deposit limited quantities of the dressing on sandwiches. In such outlets rapidity of service and uniformity of products coupled with low cost to the consumer are matters of controlling importance. Sandwiches such as hamburgers on buns are made in batches keyed to rate of demand and when salad dressing is to be applied to each member of a batch it is essential that a uniform amount is applied to each without spattering or waste and that application can be effected rapidly by relatively unskilled personnel who may apply widely varying force and velocity to the triggers of the dispensing guns.

To this end the present invention provides a disposable package comprising a cylindrical container body, preferably made of polyethylene-coated foil-laminated food-grade paperboard having a dispensing head, with nozzle temporarily sealed, secured to one end of the body and an extruding plug temporarily sealed within the other end of the body to enclose the contents for packing and shipping to point of use. At the point of use the temporary seals are removed and the cartridge is placed in a suitable dispensing gun.

The dispensing head preferably is molded from a suitable plastic material and the dispensing nozzle preferably is an integrally molded part of such head. Both head and plug preferably are sufficiently rigid to preclude distortion thereof under dispensing pressure, thus to preclude pumping of the contents. The nozzle, although integrally molded with the dispensing head is of such limited thickness relative to the remainder of the head as to provide plurality of pliable blades which taper toward a common center opening in a generally conical configuration. The blades are spaced from one another by slots of finite width extending from the region of the base of the conical configuration and each opening into the center opening aforesaid. The slots and center opening combined constitute a generally star-shaped orifice through which the contents will extrude immediately upon application of extruding pressure. Resistance to extrusion through this orifice will

cause a slight build-up of pressure within the nozzle whereupon the individual blades will open up in petal-like fashion to form an orifice which increases in diameter rapidly in response to the applied pressure. As a result the salad dressing will flow from the orifice at a volumetric rate dependent upon the rate of application of pressure to the trigger of the dispensing gun but always at a low velocity.

At the end of each dispensing stroke of the gun the pliable blades of the nozzle will spring back again to define the limited star-shaped orifice described above. The center opening is of such diameter and the slots are of such width as together to define a star-shaped orifice having a total area adequate to prevent undue pressure build-up irrespective of the force applied to the trigger. However, the center opening the slots considered individually are all substantially below any such size as would permit dribbling of the salad dressing from the nozzle in any position which the gun may assume when not actually being subjected to extruding pressure.

By forming the head and extruding plug as plastic moldings and the use of polyethylene-coated foil-laminated paperboard as the body of the container and by using a low cost material such as shrinkable plastic heat-sealing tape for securing the head and plug to the container body, the cost of the cartridge is held so low as to make discarding thereof after a single use economically preferable over the use of a reusable container which must be cleaned and sterilized and reloaded from bulk supply as an incident to each reuse.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view with parts in section of a disposable cartridge embodying the present invention and showing the same filled with a dispensable product and positioned for use in a dispensing gun, the latter being shown in phantom lines;

FIG. 2 is a view similar to FIG. 1 but showing the cartridge in the condition assumed after substantially all of the dispensable product has been dispensed;

FIG. 3 is an exploded perspective view of an empty cartridge such as shown in FIG. 1;

FIG. 4 is a perspective view of the cartridge of FIG. 3 assembled, filled and sealed;

FIG. 4A is a fragmentary view corresponding with FIG. 4 showing a modification;

FIG. 5 is an end elevational view of the top cap of the cartridge;

FIG. 6 is a side elevational view of the top cap with parts in section;

FIG. 7 is an end elevational view of the bottom plug of the cartridge; and

FIG. 8 is a side elevational view of the bottom plug with parts in section.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the drawings in FIG. 1 a disposable cartridge-type dispensing package 10 embodying the present invention is shown positioned in a dispensing gun 12, illustrated in broken lines, the cartridge being filled and ready to be unsealed for use. The gun 12 preferably is of the type which dispenses an accurately measured increment of the contents upon each actuation thereof. To this end the gun 12 may be provided with a trigger 14 and pawl and detent or other escapement means diagrammatically indicated at 15, 19 to cooperate with teeth on the piston rod of a plunger or fol-

lower generally indicated at 16, all as is well known in the art. At the forward end of the gun 12 a wall 17 is provided against which the forward end of the cartridge rests so that pressure applied by the trigger mechanism of the gun 12 may be effective to dispense the contents of the cartridge as will be explained below.

The cartridge 10 comprises a tubular body 18 preferably made of a polyethylene-coated foil-laminated food-grade paperboard having a thickness, for example, of about 0.028 inch and having a conventional side seam (see FIG. 3). The cartridge 10 also comprises a dispensing head 20 and an extruding plug or piston 22 designed to cooperate with the plunger or follower 16 of dispensing gun.

The plug 22 is preferably made in one piece such as a molding of suitable plastic material, for example a high density polyethylene. The plug 22 includes a cylindrical skirt or flange portion 24 having an outer diameter such as to fit snugly within the tubular body 18 (see FIG. 8) and having an axial length such as to preclude canting of the plug within body 18 under normal conditions of use. The plug 22 also includes an annular wall 25 extending generally transversely of the axis of the skirt 24, preferably inclined axially inwardly of the body 18 into which the plug 22 is to be fitted, thereby to impart dome-like rigidity to the wall 25. The plug 22 also includes a centrally disposed male node 26 which is so shaped as to nest with a portion of the dispensing head 20 as will be explained below.

The dispensing head 20 also preferably is made in one piece, for example as a molding of a suitable plastic material as described above in connection with the plug 22. The head 20 includes a nozzle generally indicated at 28 which is recessed in a male node 21 as will be further described. The head 20 is provided with a cylindrical skirt or flange 30 (see FIG. 6) having an inner diameter such as to fit snugly upon the outer surface of the tubular body 18 and also is provided with a generally transversely extending annular wall 32 inclined generally to conform with the inclined dome-like wall 25 of plug 22. The head 20 also has formed therein a cylindrical flange 31 (see FIG. 6) concentric with flange 30 and disposed inwardly thereof. The flange 31 has an outer diameter such as to fit snugly within the tubular body 18 whereby the flanges 30 and 31, together serve to hold the end of body 18 against distortion.

When the cartridge 10 is to be assembled and filled with contents 34 (see FIGS. 1 and 2) the parts as shown in FIG. 3 are moved, in any logical sequence, into the positions shown in FIG. 4. For example the head 20 may be telescoped on one end of a tubular body 18 and secured thereon by a tape 36 and a seal 38 may be applied over the recess in which nozzle 28 is located. The tubular body now may be filled with contents 34 after which plug 22 is inserted into the other end of the filled tubular body 18 and secured by means of a tape 40.

The tape 36 as clearly shown in FIGS. 3 and 4 is applied with a portion of its width overlying the skirt 30 of the dispensing head and the remainder of its width overlying the adjacent exterior surface of the tubular body 18, thus to seal the joint between head and body. Since this tape remains undisturbed during shipment, storage, use and ultimate discarding of the cartridge it may be wound in proper position with a suitable overlap at the ends with no provision for convenient removal. The tape 36 preferably comprises a substrate of heat-shrinkable plastic film with a coating of heat resis-

tant pressure-sensitive adhesive, whereby the tape may be quickly wound and pressed in place and subsequently exposed to heat to shrink it firmly in place.

The tape 40 also preferably is heat-shrinkable with a pressure-sensitive adhesive. It is applied, as indicated in FIGS. 3 and 4 with a portion of its width overlying the exterior surface of the tubular container 18 after the plug 22 has been inserted and with the remainder of its width folded over the end of the container body and inwardly to overlie the inner surface of the skirt 24 of plug 22, thus to seal the joint between body and plug. This tape 40 must be removed or cut when the cartridge 10 is placed in the gun 12 thereby to release the plug for movement under extruding pressure. While the tape 40 may be cut by inserting a knife blade into the joint between plug and body it is preferred to provide a more convenient manner of releasing the plug 22. Thus, as shown in FIG. 4 the overlapping end 41 of tape 40 is folded inwardly upon itself to form a tab end which will not adhere to the underlying surfaces and thus may be grasped and utilized to peel the full length of tape 40 from the cartridge 10. The tape 40, like tape 36, is preferably heat shrunk into firm engagement with plug and body when the cartridge 10 is filled and sealed for shipment.

In FIG. 1 the cartridge 10 is shown in a gun 12 with the tape 40 still in sealing position. This has been so shown in order that FIG. 1 may include a complete showing of the filled cartridge 10. In normal use, however, the tape 40 will have been removed or cut as described above before insertion of the cartridge in gun 12.

The seal 38, as shown in FIGS. 3 and 4, may be circular of a diameter somewhat greater than that of the male node 21 and may be provided, as is well known, with a tab as shown for convenient removal. Alternatively as shown in FIG. 4A a seal 38A may simply be square with sides somewhat larger than the diameter of the male node 21, in which event any one of the four protruding corners may serve as a tab. The seal 38, of whatever shape, preferably is made of metal foil, such as aluminum, coated on one surface with a pressure or heat-sensitive adhesive. The adhesive coated side of the seal 38 is pressed against the annular shoulder 42 of male node 21 and secured by application of pressure or heat and pressure as required.

As best seen in FIGS. 5 and 6 the nozzle 28 is recessed in an umbilication defined by a generally cylindrical wall 44 which turns inwardly of the male node 21 from the inner periphery of the annular shoulder 42. The nozzle 28 is generally conical and turns outwardly of the male node 21 from a base 46 at the inner end of the wall 44 and terminates in a plane somewhat inwardly of the plane of the shoulder 42. The nozzle 28 is provided with a generally star-shaped orifice which is made up of a plurality of slots 48 which converge from points near the base of the cone toward the apex of the cone and an opening 50 with which the slots 48 merge in a plane parallel with the base of the cone.

The slots 48 have a finite width, which will be discussed below, and since they open into the orifice portion 50 serve to define a plurality of separate petal-like fingers or blades 52 which taper in width measured circumferentially of the cone from the base 54 of each blade 52 to terminate in narrow tips 56 which together serve to define the orifice portion 50. Also, the blades

52 taper in thickness, measured radially, from base to tips.

The dispensing head 20, node 21, wall 44 and nozzle 28 are preferably molded in a single piece as by injection molding of a suitably semi-rigid plastic material such as a high density polyethylene. The generally transversely extending wall 32, the generally cylindrical wall of male node 21, the wall of shoulder 42 and the generally cylindrical wall 44 which defines the umbilication in which nozzle 28 is located are all of a thickness, bearing in mind the characteristics of the particular plastic material from which they are molded, such as to be sufficiently rigid to remain substantially undistorted under the maximum expected fluid pressure which may be applied in dispensing the salad dressing by operation of a dispensing gun. This is important since if these walls, or any of them, were sufficiently flexible to distort under such pressure they would spring back upon relief of pressure and would extrude additional salad dressing from the nozzle. This action is called "pumping" and is to be avoided because it would be highly undesirable for the gun to continue extruding and thus wasting salad dressing after the operator has completed a stroke of the trigger of the gun and, perhaps, has laid the gun on a surface which should be kept clean.

The fingers or blades 52 of nozzle 28, although preferably molded integrally with head 20 as noted above, are substantially thinner, radially, at the bases 54 than the walls 32, 21, 42 and 44 and they taper radially from the bases to the tips 56. This is shown most clearly in FIG. 6 which must be considered together with FIG. 5 to locate all reference numerals distributed between these figures to avoid crowding. The thickness of the walls of the fingers 52 at the bases 54 preferably is about 60% or a little less of the thickness of the walls 20 and 21 and this thickness tapers towards the tips 56 at which point the thickness preferably has been further reduced to about one-half that at the bases 54. In a nozzle 28 molded from high density polyethylene and designed for use with a salad dressing having a consistency substantially equivalent to that of mayonnaise the walls 32, 21 42 and 44 have a thickness of 0.050 inch, the wall of base 46 tapers from about 0.050 inch to the bases of fingers 52 where the thickness may be from about 0.030 inch to about 0.020 inch and on to the tips 56 where the thickness is 0.015 inch. In this same specific nozzle 28 there are eight equally spaced slots 48 each being 0.375 inch long and 0.031 inch wide. The orifice portion 50 has a diameter, defined by the tips of fingers 52, of 0.125 inch.

By following the specific dimensions just given the nozzle 28 operates with complete satisfaction with a mayonnaise-consistency product made within a reasonable range of manufacturing tolerance and at the normal range of temperatures encountered, that is from a conventional refrigeration temperature to the room temperature that may be reached without refrigeration or after the dispensing cartridge has been in use for a few hours.

By following the dimensions expressed in proportions the dispensing head 20 and nozzle 28 may be designed to take into account the differing characteristics of other plastic materials, for example polypropylenes, acrylics and the like, from which these parts may be made. Also, these proportions may be followed in the design of a dispensing head 20 and nozzle 28 for use

with salad dressings or other products which may differ somewhat in consistency from that of the mayonnaise-consistency product with which the specific embodiment of this invention is concerned.

The plug 22, FIGS. 7 and 8, may be dimensioned in much the same manner as that described in connection with the head 20. Thus, the wall 25 and the walls of male node 26 may be of equal thickness, adequate to preclude pumping, keeping in mind the characteristics of the plastic material from which the plug 22 is molded and the characteristics of the particular product to be dispensed. For the mayonnaise-consistency product for which the specific embodiment is designed and when the plug 22 is molded from a high density polyethylene these walls may all have a thickness of 0.050 inch.

Referring now to FIGS. 1 and 2 it will be apparent that after the tape 40 has been removed from the filled cartridge 10, the trigger 14 may be actuated to extrude the contents 34 through nozzle 28. Preferably each actuation of trigger 14 is effective to extrude an accurately predetermined quantity of the contents. For example, the trigger mechanism may be designed to extrude substantially exactly one-third of a fluid ounce of salad dressing on each stroke. When the contents 34 have been substantially completely dispensed the parts assume the position shown in FIG. 2 wherein the plug 22 has come into abutment with the inner annular flange 31 of head 20 and further movement is prevented. In this position of the parts the wall 25 of plug 22 lies quite close to wall 32 of head 20 and male node 26 of plug 22 is nested quite snugly within the node 21 of head 20 whereby only a small volume of contents 34 is left when the exhausted cartridge 20 must be discarded.

On each stroke of trigger 14 the nozzle 28 will automatically assure that the desired quantity of contents 34 will be dispensed at a low velocity irrespective of the manner in which trigger 14 may be activated. Assuming that the trigger is moved very slowly and gently the contents will be extruded through the orifice defined by slots 48 and opening 50 under very low pressure and little, if any outward bending or flaring of fingers 52 might occur. Such bending would occur only in the thin regions of the tips 56 of fingers 52 of nozzle 28. In such event the velocity of the extruded material would remain low even though the effective area and shape of the orifice would remain little changed from that shown in FIGS. 5 and 6. Under increased pressure due to a more rapid stroke of trigger 14 the fingers 52 will flare more markedly, the thin tip regions of the fingers opening first and the progressively thicker body portions thereof thereafter flaring in proportion to the greater volumetric flow forced by rapid actuation of the trigger 14. This proportionate flaring of fingers 52 increases the effective area of the orifice in proportion to the volumetric rate of flow, thus insuring little, if any, increase in velocity even though the trigger 14 may be squeezed with great violence. It will be apparent, of course, that trigger strokes of rapidities lying between these unlikely extremes will be effective to cause extrusion at low velocity of the desired volume of contents in a desirably brief period of time.

The shape of the fingers 52, which taper in width, measured circumferentially of the conical nozzle 28, and the tapering thickness of the fingers, measured radially of the nozzle, together take into account the fact that the area of a circle varies with the square of the ra-

dius. The narrow thin tips 56 of fingers 52 will flex under very slight increase in fluid pressure on the contents to provide the relatively great increases in orifice radius needed for the properly proportioned increases in orifice area required to prevent undue increase in velocity of extrusion. Under progressively higher fluid pressures the wider and thicker portions of fingers 52 will flex to provide the progressively diminishing increases in orifice radius which are required to afford the desired increases in orifice area.

The cartridge 10 hereinabove described has been designed for minimum cost with sufficient ruggedness to survive filling and closing and packing in suitable groups in shipping containers which are delivered to the food outlet where the cartridges are removed from the case as needed for reloading the dispensing guns. More rugged and more expensive construction may be utilized to adapt the cartridges for the additional demands which would be placed upon them if they are to be distributed for individual handling and retail sale to private consumers or individual restaurants. Indeed, the cartridges embodying the present invention may be so constructed as to lend themselves to repeated use involving cleaning and refilling. In all events the provision of the self adjusting nozzle 28 and the recessing thereof within an umbilication in the node 21 of the dispensing head 20 will afford the various advantages described above.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of the features shown and described or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

What is claimed is:

1. In a cartridge-type dispensing package comprising a hollow cylindrical container for holding a supply of semisolid extrudable contents, said body being closed at one end by a dispensing head and closed at the other end by a plug adapted to serve as a piston within said body for cooperation with a dispensing gun to extrude increments of the contents of said package through said dispensing head when said dispensing gun is actuated to apply pressure through said plug upon said contents, the improvement which comprises a self-adjusting velocity-limiting extrusion nozzle in said dispensing head, said extrusion nozzle comprising a cone made of flexible and resilient material, said cone having a circular orifice portion lying in a plane transverse the axis of said cone and truncating said cone near the apex thereof, and a plurality of slots formed in said cone and extending in converging relation from points near the base of said cone into said circular orifice portion, the material of said cone lying between said slots comprising a plurality of flexible resilient fingers which taper in width from base portions near the base of said cone and terminate in tips arranged around and thus defining said circular orifice portion, said circular orifice portion and said slots together constituting a star-shaped orifice having a predetermined total area when no pressure is applied to said contents by actuation of said dispensing gun, and said fingers when said contents are extruded through said nozzle by application of varying amounts of pressure upon said contents by said dispensing gun yielding with progressively increasing resistance from tips to base portions thereof to flare apart

and increase the area of said star-shaped orifice in proportion to said varying amounts of pressure applied to said contents.

2. A dispensing package in accordance with claim 1 wherein said dispensing head is provided with a substantially cylindrical male node extending in the direction of extrusion of contents through said nozzle and terminating in an annular shoulder lying in a plane transverse the cylindrical axis of said node, and wherein said extrusion nozzle is recessed in an umbilication formed in said node, and wherein said circular orifice portion of said nozzle lies in a plane disposed inwardly, with respect to said node, of the plane of said annular shoulder.

3. A dispensing package in accordance with claim 2 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

4. A dispensing package in accordance with claim 1 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

5. In a cartridge-type dispensing package comprising a hollow cylindrical container for holding a supply of semisolid extrudable contents, said body being closed at one end by a dispensing head and closed at the other end by a plug adapted to serve as a piston within said body for cooperation with a dispensing gun to extrude increments of the contents of said package through said dispensing head when said dispensing gun is actuated to apply pressure through said plug upon said contents, the improvement which comprises a self-adjusting velocity-limiting extrusion nozzle in said dispensing head, said extrusion nozzle comprising a cone made of flexible and resilient material, said cone having a circular orifice portion lying in a plane transverse the axis of said cone and truncating said cone near the apex thereof, and a plurality of slots formed in said cone and extending in converging relation from points near the base of said cone into said circular orifice portion, the material of said cone lying between said slots comprising a plurality of flexible resilient fingers which taper in width from base portions near the base of said cone and terminate in tips arranged around and thus defining said circular orifice portion and each of said fingers also tapering in thickness measured radially of said cone from points near the base of said cone to said tips, said circular orifice portion and said slots together constituting a star-shaped orifice having a predetermined total area when no pressure is applied to said contents by actuation of said dispensing gun, and said fingers when said contents are extruded through said nozzle by application of varying amounts of pressure upon said contents by said dispensing gun yielding with progressively increasing resistance from tips to base portions thereof to flare apart and increase the area of said star-shaped orifice in proportion to said varying amounts of pressure applied to said contents.

6. A dispensing package in accordance with claim 2 wherein said dispensing head is provided with a substantially cylindrical male node extending in the direction of extrusion of contents through said nozzle and terminating in an annular shoulder lying in a plane transverse the cylindrical axis of said node, and wherein said extrusion nozzle is recessed in an umbilication formed in said node, and wherein said circular orifice portion of said nozzle lies in a plane disposed inwardly, with respect to said node, of the plane of said annular shoulder.

7. A dispensing package in accordance with claim 6 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

8. A dispensing package in accordance with claim 5 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

9. In a cartridge-type dispensing package comprising a hollow cylindrical container for holding a supply of semisolid extrudable contents, said body being closed at one end by a dispensing head and closed at the other end by a plug adapted to serve as a piston within said body for cooperation with a dispensing gun to extrude increments of the contents of said package through said dispensing head when said dispensing gun is actuated to apply pressure through said plug upon said contents, the improvement which comprises a self-adjusting velocity-limiting extrusion nozzle in said dispensing head, said extrusion nozzle comprising a cone made of flexible and resilient material, said cone having a circular orifice portion lying in a plane transverse the axis of said cone and truncating said cone near the apex thereof, and a plurality of slots formed in said cone and extending in converging relation from points near the base of said cone into said circular orifice portion, the material of said cone lying between said slots comprising a plurality of flexible resilient fingers which taper in width from base portions near the base of said cone and terminate in tips arranged around and thus defining said circular orifice portion, said circular orifice portion and said slots each having dimensions sufficiently small to prevent flow of said contents therethrough when no pressure is applied to said contents by said dispensing gun, said circular orifice portion and said slots together constituting a star-shaped orifice having a predetermined total area when no pressure is applied to said contents by actuation of said dispensing gun, said predetermined total area being such as to permit flow therethrough of said contents at a substantial volumetric rate immediately upon application of pressure of any amount upon said contents by said dispensing gun, and said fingers when said contents are extruded through said nozzle by application of varying amounts of pressure upon said contents by said dispensing gun yielding with progressively increasing resistance from tips to base portions thereof to flare apart and increase the area of said star-shaped orifice in proportion to said

varying amounts of pressure applied to said contents.

10. A dispensing package in accordance with claim 9 wherein said dispensing head is provided with a substantially cylindrical male node extending in the direction of extrusion of contents through said nozzle and terminating in an annular shoulder lying in a plane transverse the cylindrical axis of said node, and wherein said extrusion nozzle is recessed in an umbilication formed in said node, and wherein said circular orifice portion of said nozzle lies in a plane disposed inwardly, with respect to said node of the plane of said annular shoulder.

11. A dispensing package in accordance with claim 10 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

12. A dispensing package in accordance with claim 9 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

13. In a cartridge-type dispensing package comprising a hollow cylindrical container for holding a supply of semisolid extrudable contents, said body being closed at one end by a dispensing head and closed at the other end by a plug adapted to serve as a piston within said body for cooperation with a dispensing gun to extrude increments of the contents of said package through said dispensing head when said dispensing gun is actuated to apply pressure through said plug upon said contents, the improvement which comprises a self-adjusting velocity-limiting extrusion nozzle in said dispensing head, said extrusion nozzle comprising a cone made of flexible and resilient material, said cone having a circular orifice portion lying in a plane transverse the axis of said cone and truncating said cone near the apex thereof, and a plurality of slots formed in said cone and extending in converging relation from points near the base of said cone into said circular orifice portion, the material of said cone lying between said slots comprising a plurality of flexible resilient fingers which taper in width from base portions near the base of said cone and terminate in tips arranged around and thus defining said circular orifice portion and each of said fingers also tapering in thickness measured radially of said cone from points near the base of said cone to said tips, said circular orifice portion and said slots each having dimensions sufficiently small to prevent flow of said contents therethrough when no pressure is applied to said contents by said dispensing gun, said circular orifice and said slots together constituting a star-shaped orifice having a predetermined total area when no pressure is applied to said contents by actuation of said dispensing gun, said predetermined area being such as to permit flow therethrough of said contents at a substantial volumetric rate immediately upon application of pressure of any amount upon said contents by said dispensing gun, and said fingers when said contents are extruded through said nozzle by application of varying amounts of pressure upon said contents by said dis-

5 dispensing gun yielding with progressively increasing resistance from tips to base portions thereof to flare apart and increase the area of said star-shaped orifice in proportion to said varying amounts of pressure applied to said contents.

14. A dispensing package in accordance with claim 13 wherein said dispensing head is provided with a substantially cylindrical male node extending in the direction of extrusion of contents through said nozzle and terminating in an annular shoulder lying in a plane transverse the cylindrical axis of said node, and wherein said extrusion nozzle is recessed in an umbilication formed in said node, and wherein said circular orifice portion of said nozzle lies in a plane disposed inwardly, with respect to said node, of the plane of said annular shoulder.

15. A dispensing package in accordance with claim 14 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

16. A dispensing package in accordance with claim 13 wherein said plug and said dispensing head with said extrusion nozzle each constitute a one-piece molding of semi-rigid plastic material with all parts thereof except said fingers of said nozzle being of thickness sufficient to substantially preclude distortion thereof under any pressure which may be applied to said contents by actuation of said dispensing gun.

17. A disposable cartridge-type dispensing package comprising a hollow cylindrical container for holding a supply of salad dressing having a consistency substantially equivalent to that of mayonnaise, said body being closed at one end by a dispensing head and closed at the other end by a plug adapted to serve as a piston within said body for cooperation with a dispensing gun to extrude increments of said salad dressing through said dispensing head when said dispensing gun is actuated to apply pressure through said plug upon said salad dressing, a self-adjusting velocity-limiting extrusion nozzle in said dispensing head, said extrusion nozzle comprising a cone made of flexible and resilient material, said cone having a circular orifice portion lying in a plane transverse the axis of said cone and truncating said cone near the apex thereof, and a plurality of slots formed in said cone and extending to converging relation from points near the base of said cone into said circular orifice portion, the material of said cone lying between said slots comprising a plurality of flexible resilient fingers which taper in width from base portions near the base of said cone and terminate in tips arranged around and thus defining said circular orifice portion and each of said fingers also tapering in thickness measured radially of said cone from points near the base of said cone to said tips, said circular orifice portion and said slots having a diameter and widths, respectively, such that said salad dressing will flow therethrough only upon application of pressure to said salad dressing by actuation of said dispensing gun, and said orifice portion and said slots together constituting a star-shaped orifice having a predetermined total area when no pressure is applied to said salad dressing by actuation of said dispensing gun, said predetermined total area being such as to permit flow therethrough of said

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salad dressing at a substantial volumetric rate immediately upon application of pressure of any amount upon said salad dressing by said dispensing gun, and said fingers when said salad dressing is extruded through said nozzle by application of varying amounts of pressure upon said salad dressing by said dispensing gun yielding with progressively increasing resistance from tips to base portions thereof to flare apart and increase the total area of said star-shaped orifice in proportion to said varying amounts of pressure applied to said salad dressing.

18. A disposable dispensing package in accordance with claim 17 wherein said hollow cylindrical container comprises a tube formed of foil-laminated paperboard having a polyethylene coating on the inside surface thereof and having a longitudinally extending side seam, and wherein said plug and said dispensing head with said extrusion nozzle each are one-piece moldings of a semi-rigid plastic material.

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19. A disposable dispensing package in accordance with claim 18 wherein said dispensing head has formed therein a substantially cylindrical male node extending in the direction of extrusion of said salad dressing through said dispensing nozzle and terminating in an annular shoulder lying in a plane transverse the cylindrical axis of said node, and wherein said extrusion nozzle lies wholly within an umbilication formed in said male node.

20. A disposable dispensing package in accordance with claim 17 wherein, when said package is filled with salad dressing for transportation to point of use, said dispensing head is sealed by a removable membrane adhesively secured to said annular shoulder thus to overlie said recessed nozzle, and wherein said plug is sealed by removable sealing tape secured to the exterior of said hollow cylindrical container and to said plug to span the opening between plug and container.

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