

Aug. 6, 1968

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3,395,835

AUTOMATIC DISPENSING MEANS

Filed Oct. 20, 1966

2 Sheets-Sheet 1

Fig. 1.

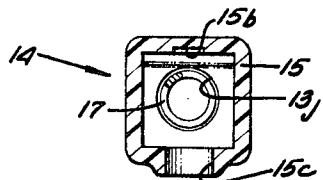
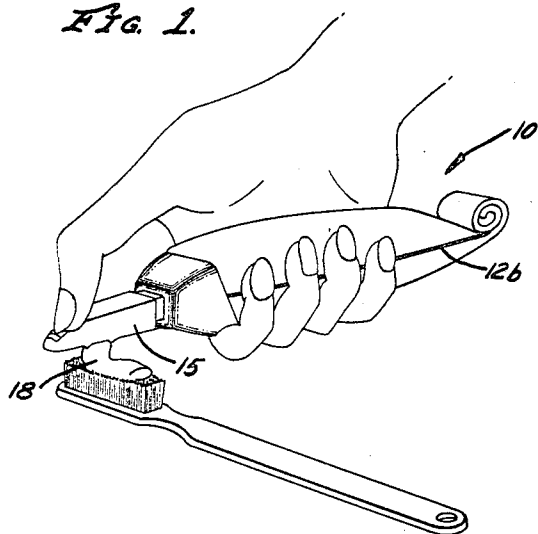


Fig. 5.

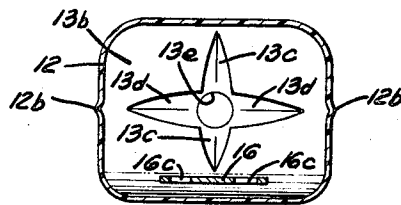


Fig. 6.

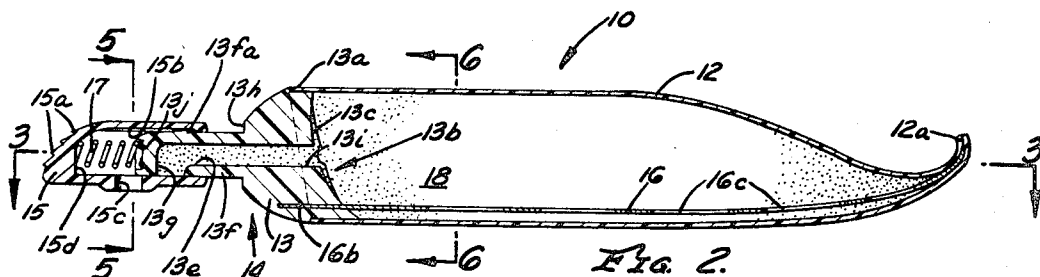


Fig. 2.

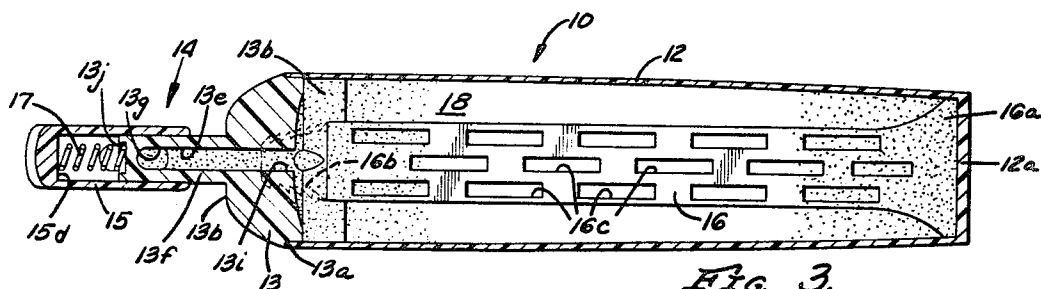


Fig. 3.

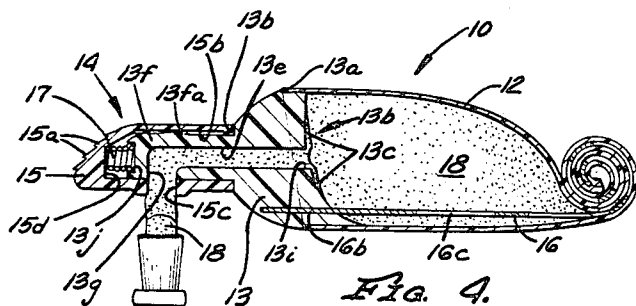


Fig. 4.

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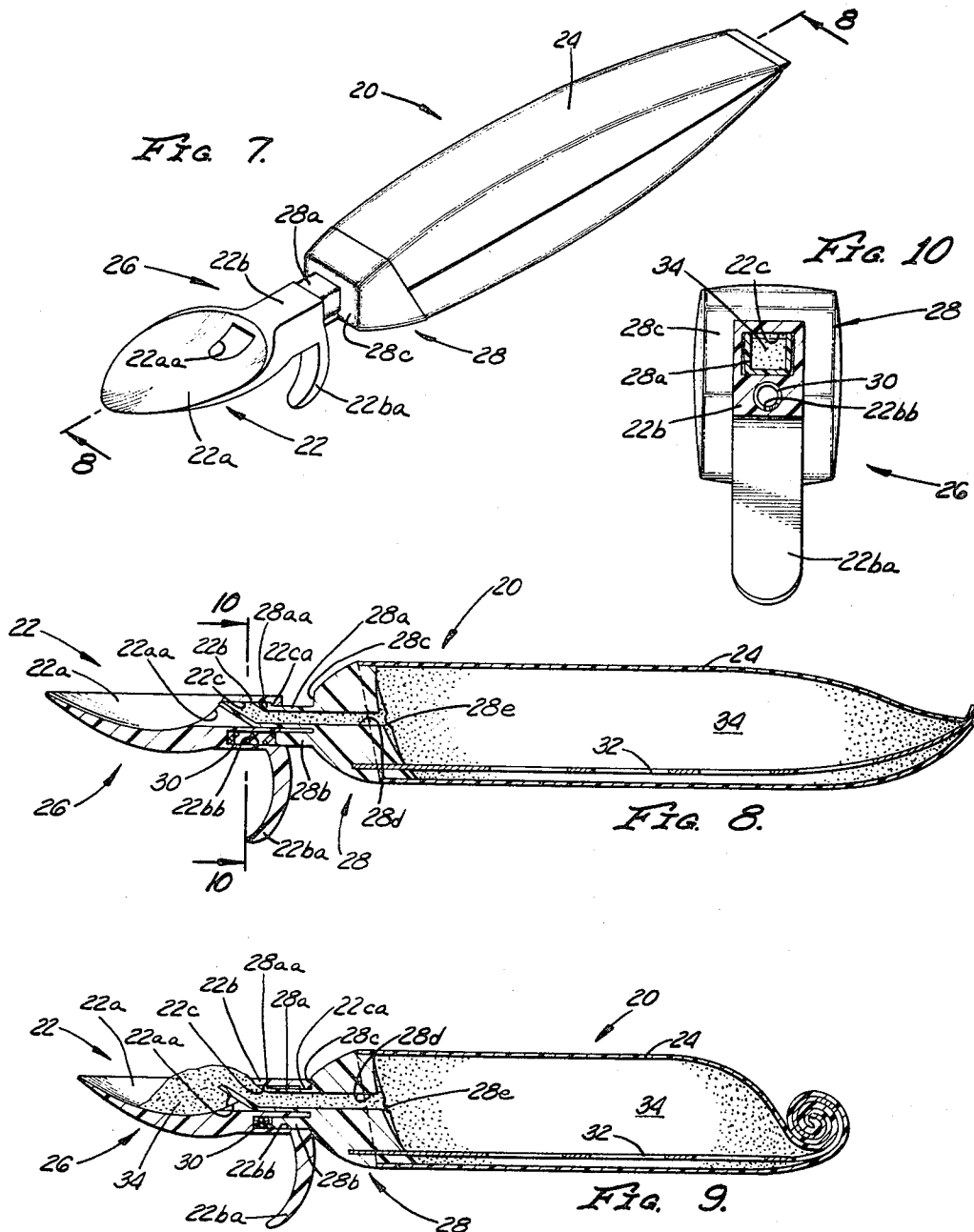
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AUTOMATIC DISPENSING MEANS

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2 Sheets-Sheet 2



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AUTOMATIC DISPENSING MEANS
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1 Claim. (Cl. 222—99)

This invention relates generally to automatic dispensing containers for pasty, and viscous liquid, materials, and more particularly to such containers having unique suitability for toothpaste dispensing purposes in one form and for baby and invalid food dispensing purposes in another form.

Toothpaste is by far the most common, and popular, type of dentifrice in the United States, and probably most, if not all, of the civilized countries of the world, today. Toothpaste is conventionally packaged in tubes of the familiar, thin-walled type, crimp-closed at one end having a discharge nozzle, typically threaded to receive a closure cap, at the other end. The toothpaste is dispensed by squeezing the sides of the uncapped tube until the desired quantity of paste has been extruded through its open end.

While the conventional toothpaste tube has remained essentially unchanged for many years, and has, on the whole, served its purpose well, it is nevertheless characterized by certain inherent shortcomings, chief among which is a ready, almost enticing, amenability to improper squeezing in the middle. The untidy habit of squeezing toothpaste tubes in the middle is aggravating to many who, for family, or other, reasons, share tubes with those who are addicted to it. As another shortcoming of the conventional toothpaste tube, its screw-on cap requires sufficient replacement effort to discourage the lazy, smaller children, etc., from replacing it after using the tube.

The lazy, or careless, habit of leaving caps off of toothpaste tubes can have undesirable consequences, including the hardening of toothpaste in the tube nozzle thus exposed to air, oozing loss of toothpaste through the tube nozzle, loss of the tube cap with resultant incapacitation of the tube for travelling, or similar, purposes, etc. Still another shortcoming of the conventional toothpaste tube, or, more accurately, any tube of the toothpaste containing type, is its incapacity for very precise discharge flow control, a disadvantage of greater concern in the case of viscous liquids of the type often packaged in such tubes, as, for example, certain glues and the like, than in the case of pasty materials such as toothpastes.

I have now invented a tubular container for pasty or viscous liquid materials, and particularly toothpastes, baby foods, invalid foods, etc., which is self-dispensing in the sense that no manual squeezing is required for removal of its contents, and which, by virtue of its design and manner of functioning, is free of the above-noted disadvantages of conventional tubes of the toothpaste dispensing type.

It is thus a principal object of the present invention to provide a tubular container for pasty materials or viscous liquids which is self-dispensing in the sense that no manual squeezing, but only a simple push button manipulation, is required for discharge of its contents.

It is another object of the invention to provide such a container with cooperating means for the precise flow control of material being dispensed therefrom.

It is still another object of the invention to provide such a container which uniformly and automatically discharges its contents, under the control of the user, in such a way as to avoid the erratic squeezing problems common to conventional tubes of the toothpaste dispensing type.

It is yet another object of the invention to provide such a container which closes itself automatically after periods of dispensing use thereby avoiding the possibility of its

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being left open with consequent ill effects such as those resulting from failure to replace the cap on a conventional toothpaste tube.

It is a still further object of the invention to provide such a tubular container with improved means for controlling the flow of material being discharged, or dispensed, therefrom.

Other objects, features and advantages of the invention will appear in the light of the complete description thereof to follow, considered in conjunction with the accompanying drawings, of which:

FIGURE 1 is a perspective view of a preferred embodiment of a partially loaded tubular container in accordance with this invention dispensing toothpaste onto a toothbrush under the control of an individual whose right hand is shown in grasping and manipulating relationship relative thereto.

FIGURE 2 is a longitudinal sectional view of a closed, fully loaded tubular container similar to that shown in FIGURE 1 and disposed in its normal position of use, the view being taken generally along a plane vertically bisecting the container.

FIGURE 3 is another longitudinal sectional view of the closed, fully loaded container, but taken along line 3—3 of FIGURE 2 as it would cut said container if the latter had its permanently closed end straightened out and was properly positioned to permit its sectioning at the illustrated plane of cleavage, some of the internal structure of said container which would actually be hidden by toothpaste in a true section being shown as though not so hidden for obvious purposes of improved pictorial illustration of the invention.

FIGURE 4 is a longitudinal sectional view of the container and its toothpaste contents, similar to the FIGURE 2 view but showing the container as it appears during, and after partial, discharge of toothpaste therefrom, and showing the end of a toothbrush onto which the toothpaste is being discharged.

FIGURE 5 is an enlarged cross-sectional view of the front end of the container, taken along line 5—5 of FIGURE 2.

FIGURE 6 is an enlarged cross-sectional view of the body of the loaded container, taken along line 6—6 of FIGURE 2.

FIGURE 7 is a perspective view of a second embodiment of a tubular container in accordance with this invention, the container being of a type suitable for baby food dispensing purposes and being shown in its fully loaded form.

FIGURE 8 is a longitudinal sectional view of a closed, loaded tubular container similar to that shown in FIGURE 7 and disposed in a normal position of use, the view being taken along a plane vertically bisecting the container.

FIGURE 9 is a longitudinal sectional view of the container and its contents, similar to the FIGURE 8 view but showing the container as it appears during, and after partial, discharge of said contents therefrom.

FIGURE 10 is an enlarged cross-sectional view of the front end of the container, taken along line 10—10 of FIGURE 8.

Considering now the drawings in greater detail, and concentrating first on FIGURES 1 through 6, there is shown generally at 10 a self-dispensing tubular container in accordance with this invention. Each of FIGURES 1 through 6 depicts a container of the same design, which will henceforth be referred to as tubular container, or simply container, 10. Tubular container 10 consists of a thin-walled tube 12, crimp-closed at one end and open at the other, the crimp-closed end being shown at 12a; a nozzle plug assembly 14 fitted into, and permanently secured in place at, the open end of the tube; and a coil spring 16 fastened

internally of tube 12 in the manner shown in the drawing and later to be described in detail. Thin-walled tube 12 is preceased along its lateral edges, as shown at 12b, to permit its easier and tighter roll up as toothpaste is dispensed therefrom in accordance with the dispensing method of this invention, presently to be described in detail.

Nozzle plug assembly 14 consists of three parts, two of which are movable with respect to the third, namely, a plug member 13, a cap 15 which fits over the front end of plug member 13 and a spiral spring 17. The rear portion of plug member 13 fits tightly into the open end of tube 12 in the manner illustrated in the drawing, and shortly to be described. In its partly inserted position within tube 12, that part of plug member 13 disposed forwardly of the tube, to the left in FIGURES 2, 3 or 4, narrows and then converges inwardly to form a shoulder 13h, after which it extends forwardly in the form of an elongate neck 13f generally similar in cross-sectional shape to, and coaxial with, the rest of the plug member, all as illustrated in the drawing.

Running longitudinally of and centrally within plug member 13 is a bore 13e. Bore 13e extends forwardly from a rear opening 13i in the plug member to near the front end of neck 13f, at which point it turns sharply downwardly, through a right-angled bend, to form a downcomer terminating in an opening 13g in the bottom of said neck. Here, as well, incidentally, as at the other places of referral in this description to the top or bottom or upper or lower part, of container 10, or any of its component parts, implied reference to the normal position of use of the container, as best illustrated in FIGURES 1, 2 and 4, is intended.

Plug member 13 of nozzle plug assembly 14 has an encircling shoulder 13a near its rear end (the end to the right in FIGURE 2, 3 or 4), aft of which the plug member is of reduced size and shaped and dimensioned for tight fitting insertion into the open end of tube 12, in the previously-indicated manner. Neither shoulder 13a, nor the rim of the open end of tube 12, falls in a plane perpendicular to the axis of the nozzle plug assembly or tube, but in a plane slightly angled therefrom, as FIGURE 2 illustrates particularly well by means of a dotted line, shown at x, delineative of the line of hidden interfit between the shoulder and rim on the far side of the tubular container as there depicted. This deviation from perpendicularity with respect to the axes of the above-identified parts of the tubular container is not critically necessary to the design of the container but is a feature believed contributive to enhanced strength and durability of the latter, the reasons for which will be evident to those skilled in the tubular container manufacturing arts from an understanding of the structural and functional aspects of my invention as taught herein. It will be even more evident that shoulder 13a of plug member 13 and the rim of the open end of tube 12 are biased equally from the above-noted state of perpendicularity to bring them into proper juxtaposition for properly cooperating interfit of the involved parts of the assembled container.

The cross-sectional configurations of tube 12 and plug member 13 of nozzle plug assembly 14 are, of course, matched to permit insertion of the latter to its shoulder 13a into the open end of the former in the tight fitting manner described above, and illustrated in the drawing, the configurations being, as FIGURE 6 best shows, generally rectangular with rounded corners. The nozzle plug assembly is, as previously indicated, fixedly secured to tube 12 in its position of partial insertion therein, this being accomplished by glue means, or its equivalent. Plug member 13 of the nozzle plug assembly and tube 12 are both of plastic construction, the former being made of a relatively hard and tough plastic material and the latter of a resiliently deformable plastic of such type as to permit temporary deformation of the tube under a relatively weak force and spring back thereof into its normal shape upon release of the force.

Plug member 13 of the nozzle plug assembly has a butt end 13b of sloping, and slightly arcuate, configuration which provides a gently curving and sloping front barrier to the toothpaste containing area within tube 12. Butt end 13b, in addition to being curvingly sloping, has four channeled guideways engraved therein, two of which, shown at 13c and hereinafter referred to as channels 13c, run up and down within container 10 in its normal position of use, and the other two of which, shown at 13d, and hereinafter referred to as channels 13d, run crosswise of the container, or perpendicularly to the direction of alignment of channels 13c. Channels 13c and 13d converge radially inwardly and terminate at rear opening 13i of bore 13d in plug member 13, from radially outwardly disposed tips on the butt end of said base member. Each of the pairs of channels 13c and 13d, respectively, is symmetrical about rear opening 13i, and each channel gradually narrows and decreases in depth in a direction away from said opening and towards its tip end. The channels serve the purpose, as will be seen, of helping to funnel toothpaste from tube 12 into bore 13e of nozzle plug assembly 14 during dispensing use of container 10.

Cap 15 is a hollow, elongate, open-ended member constructed of a relatively hard, tough and resilient plastic and so sized and shaped as to fit slidingly over neck 13f of plug member 13 of nozzle plug assembly 14. The top, or upper, wall of the cap curves downwardly, at its front end, toward a rounded bottom corner and is there characterized by the presence of a series of transverse ridges 15a calculated to provide a rough thumb grip area for a purpose hereinafter to be explained. Also, the upper cap wall has a relatively wide groove 15b in its under-surface which runs longitudinally forwardly from a point near the open end of the cap to a point near the down-curving portion of its upper wall, all as illustrated in FIGURES 2, 4 and 5. Neck 13f has an upstanding stop formation 13fa with a flat rearwardly facing side and sized to fit snugly, but nonbindingly, within, and crosswise of, groove 15b. The end of groove 15b nearest the open end of cap 15 is defined by a flat segment of the cap wall and both it and the rearwardly facing side of stop formation 13fa are disposed perpendicularly to the axis of plug member 13 when nozzle plug assembly 14 is fitted together as shown in the drawings. It will thus be apparent that when cap 15 is pulled in the forward direction along neck 13f of plug member 13, the rearwardly facing side of stop formation 13fa eventually comes flush against the cap wall segment defining the aforesaid end of groove 15b to prevent further movement of the cap in that direction. This forward terminus of cap travel is shown in FIGURE 2.

From the foregoing, it will be apparent that cap 15 is not removable from container 10 during use and normal functioning of the latter. The plastic material from which the cap is made is sufficiently resilient to permit snap fitting of the latter onto the neck of plug member 13 and over its stop formation 13fa.

In the lower wall of cap 15 is an opening 15c of the same size and shape as opening 13g in the bottom of neck 13f of plug member 13. Opening 15c serves to provide a port for the discharge of toothpaste from container 10 in a manner soon to be described.

The forwardly facing end of neck 13f of base member 13 is characterized by the presence of a circular depression 13j having an axial center coincident with the axial center of said neck. The depression is properly sized to serve as a seat for one end of spiral spring 17. The other end of the spring fits flush against a flat section 15d of wall at the closed, or blind, end of the cap, this section being, as a result of convergence of the upper and lower cap walls in the forward direction, of sufficiently small size to hold the spring end at, and prevent its migration away from, a captive position of optimum functioning utility, all as illustrated in the drawings. Spring 17 is of suitable size and power to fit within cap 15 in the end-

captivated position described above and urge the cap to its forwardmost position of permissible travel, as illustrated in FIGURE 2. This corresponds to the closed position of the discharge opening of container 10, since, as FIGURE 2 shows, opening 15c in the cap and 13i in plug member 13 are out of alignment and the former is blocked by an adjacent segment of the bottom wall of the cap. To open the container for toothpaste discharge purposes, it is grasped in the manner illustrated in FIGURE 1, with the thumb in position on the ridged end of cap 15, and the cap is then pushed backwardly, to the right as viewed in FIGURE 4, until its open end comes flush against shoulder 13h of plug member 13, in which position openings 13i and 15c of the plug member and cap, respectively, come into alignment to permit the flow of toothpaste there-through.

Coil spring 16 is a precoiled strip of resilient metal of roughly half the width of tube 12 throughout most of its length, as FIGURE 3 illustrates. Although tube 12 narrows gradually toward its rear end, to the right in FIGURE 3, there is no critical significance to this and the tube could just as well be of constant width throughout its length or widen, rather than become narrower, in the rearward direction. The coil spring fishtails at its rear end and terminates in a transverse tail strip 16a of sufficient size to fit snugly between the strips of crimped tube wall forming the crimp-closed end of tube 12, all as illustrated in the drawings, and particularly FIGURES 2 and 3. The spring is coated with a suitable material to protect it against oxidation.

Coil spring 16 has serrated edges near its front end which taper to form a blunt-tipped nose 16b suitable for anchoring embedment in plug member 13 of nozzle plug assembly 14. Nose 16b of the spring is thusly embedded in the butt end of plug member 13 below opening 13i and in such parallel relationship to bore 13e in the plug member as to permit uncoiled rearward extension of the spring within tube 12 to twist-free fit of its tail strip 16a between the crimped together strips of tube wall forming the crimp-closed end of the tube, all as illustrated in FIGURES 2 and 3. The foregoing description is considered complete enough, without more, to make clear, with the aid of the drawings, the relative size, shape and character of coil spring 16 and the manner in which it is secured to and oriented within tube 12 of container 10.

Coil spring 16 has an extensive pattern of perforating slots 16c, as shown particularly well in FIGURE 3. These slots permit toothpaste to flow through the spring and equalize the pressure on its two sides during dispensing use of container 10, the manner of which use will subsequently be revealed. While spring 16 is illustratively of metallic construction, it could, if desired, be made of any other material having the necessary properties of toughness, resiliency, etc., for the purpose.

Although coil spring 16 has heretofore been described in terms of reference to its uncoiled shape, as illustrated in FIGURES 2 and 3, it will be understood, of course, that the spring assumes this shape only when a straightening force of some kind is applied thereto. After removal of the force, the spring returns to its coiled shape by rolling itself up in the manner partially demonstrated in FIGURE 4. In this connection, FIGURES 2 and 3 show container 10 fully loaded with toothpaste there denoted by the numeral 18, and hereinafter referred to as toothpaste 18, and FIGURE 4 shows the container after partial evacuation of the toothpaste therefrom. When the container is fully loaded with toothpaste, it fills the hollow interior of tube 12 and, so long as prevented from escaping, holds the tube and spring 16 in a state of extended rigidity, such as illustrated in FIGURES 2 and 3.

Because of its self-coiling tendency, spring 16 exerts a continuous winding force on tube 12 which causes the latter to wind from the rear as toothpaste is dispensed therefrom. While this force is, as indicated above, counter-

balanced by the pressure of the toothpaste when container 10 is closed and fully loaded, as soon as an escape route for the latter is offered the spring force manifests itself by squeezing toothpaste therethrough and providing the container with the self-dispensing capability hallmarking the present invention. Such an escape route is, of course, afforded when the front end of the container is opened, this being accomplished, as will now be clear, when opening 15c in the bottom of cap 15 is brought into alignment with opening 13g in the neck of plug member 13 of nozzle plug assembly 14. It will therefore be apparent that container 10 is opened for toothpaste dispensing purposes by grasping it in the manner illustrated in FIGURE 1 and pushing cap 15 toward shoulder 13h of plug member 13 with the thumb as far as it will go. This manipulation brings opening 15c in the cap even with opening 13g in the neck of plug member 13 and thus provides a port for the discharge of toothpaste from the container.

When a toothpaste discharge port for container 10 is provided in the above-described manner, the persistent force from coil spring 16 urges toothpaste out of the container. As toothpaste is thus evacuated, spring 16 exerts a coiling effect on tube 12, causing the tube and spring to roll themselves into a coil from the rear, the size of the coil, of course, increasing as more and more toothpaste is forced out of the tube. The toothpaste evacuation and tube coiling continues until the tube is substantially empty, at which point it is coiled up close to the butt end of plug member 13 of nozzle plug assembly 14. Tube 12 will normally be evacuated of toothpaste a small bit at a time, only enough for immediate toothbrushing needs being, as a general rule, dispensed with each opening of the container. FIGURE 1 shows container 10 as it appears after only a small amount of toothpaste has been dispensed therefrom, and FIGURE 4 shows it after a much greater quantity of the toothpaste, perhaps about half of that originally present, has been evacuated.

As will be apparent, the outflow of toothpaste from container 10 is easily controlled, or stopped, by appropriate manipulation of cap 13 with the thumb, the thumb pressure on the cap being released, for example, when a desired quantity of toothpaste has been discharged from the container. After such pressure release, the unchecked force of spiral spring 17 urges cap 15 forward, or leftward as seen on the drawing, to the position shown in FIGURE 2, thereby moving opening 15c out of alignment with opening 13g of plug member 13 and effectuating closure of the discharge port of the container. In addition to the easy control of toothpaste flow achievable with the nozzle plug assembly of container 10, simplified control of the flow direction of the paste is achievable by virtue of the downward direction of toothpaste flow through the discharge opening of the assembly, as opposed to the forward direction of toothpaste outflow from a conventional tube. The quick and effective severance of the flowing stream of toothpaste by manipulation of cap 15 in the above-described manner also contributes to good toothpaste flow control, as well as to improved sanitation, since there is no necessity of contacting any part of container 10 with an individual's toothbrush, or vice versa, in attempting to sever dispensed toothpaste from the main body of toothpaste in the tube. Such toothbrush contact is common in the utilization of conventional toothpaste tubes since they have no mechanical means of clearly severing extruded paste.

The foregoing explanation, coupled with the drawing illustrations, is sufficient to teach the manner of use and functioning of container 10. In this connection, it will, of course, be clear that coil spring 16 must be sufficiently strong to coil itself and tube 12 in the above-described manner and concomitantly eject toothpaste from tube 12 when its discharge end is open, and that tube 12 must be of adequately yielding nature to permit this. The reason for the slot perforations in the coil spring will now also be clear, this being primarily to allow fluid

movement of the toothpaste with a minimum of hindrance from the spring during the above-described, self-induced tube winding and toothpaste dispensing action of container 10. The presence of such slots in the spring is of no critical necessity, however, and a coil spring differing wholly or partly in either perforation shape or arrangement, or both, or having no perforations at all, can be substituted for spring 16 within the scope of the present invention.

The selection of suitable materials of construction, determination of satisfactory design particulars, etc., for the various parts of dispensing container 10 (as well, incidentally, as of all other dispensing container embodiments of my invention) can be readily accomplished in the light of present teachings by those skilled in the art to which they pertain.

FIGURE 7 through 10 show generally at 20 a second embodiment of my dispensing container particularly suitable as a baby feeder and hereinafter referred to as baby feeder 20. Baby feeder 20 is generally similar in structure and manner of functioning to container 10, although its front (dispensing) end is different in appearance from the front end of the latter, primarily because it has a slidable feeding spoon head 22, hereinafter referred to as feeding spoon 22, in place of slidable cap 15 of container 10.

Baby feeder 20 comprises a thin-walled tubular member 24 (crimp-closed at one end and open at the other), a nozzle plug assembly 26 and an internal coil spring 32, corresponding to tube 12, nozzle plug assembly 14 and coil spring 16, respectively, of container 10. Nozzle plug assembly 26, in turn, comprises a plug member 28, feeding spoon 22 and a spiral spring 30, corresponding generally to plug member 13, cap 15 and spiral spring 17 of nozzle plug assembly 14 of container 10. Plug member 28 of the nozzle plug assembly is so configured as to fit snugly into the open end of thin-walled tubular member, or tube, 24, similarly to the way plug member 13 fits into the open end of thin-walled tube 12 of container 10. From where the plug member is inserted into tube 24 to the rear end of the latter, baby feeder 20 is virtually duplicative of container 10. The contents of baby feeder 20 are, however, as the name of the latter implies, minced baby food (shown at 34), rather than the toothpaste filler of container 10.

From the area of interfit of plug member 28 in thin-walled tube 24 to the front of baby feeder 20, the latter differs in appearance from container 10, although each functions in much the same fashion as the other. More specifically, plug member 28 narrows, forward of its area of interfit with tube 24, toward a shoulder 28c, similar to shoulder 13h of plug member 13, and thereafter extends forwardly in the form of an elongate neck 28a of generally square cross section, disposed perpendicularly to said shoulder, and a stud-like projection 28b, of circular cross section and flat forward end, extending normally from the plane of shoulder 28c, directly under and axially parallel to, but not as long as, neck 28a. Running longitudinally through plug member 28, from an opening 28e in its butt end, corresponding to opening 13i of plug member 13, and through neck 28a is a bore 28d serving as a discharge passageway for minced baby food from the baby feeder.

Feeding spoon 22 has a forwardly extending spoon portion 22a and a rearwardly disposed sliding segment 22b, integral therewith. Sliding segment 22b comprises an upper main portion, or body, and an integral trigger 22ba which depends downwardly from the rear part of the bottom thereof. The body portion of sliding segment 22b of the feeding spoon is adapted to fit slidably on neck 28a and projection 28b of plug member 28, and to this end it has a receptive passageway 22c for the neck which extends longitudinally therethrough and opens into the back part of the bowl of spoon segment 22a at 22aa, and a blind mating opening 22bb for stud-like projection 28b

extending inwardly from its rear face parallelly to and below passageway 22c, all as shown in the drawings.

Feeding spoon 22 is made of the same type of resilient plastic material as is cap 15 of container 10, and it snaps into place in freely sliding contact with neck 28a and projection 28b of plug member 28 similarly to the way cap 15 snaps onto the neck of plug member 13. Neck 28a of plug member 28 turns upwardly at its outer end, as FIGURES 8 and 9 show, to terminate in an outer opening having a rim which fits flat against the upper wall, or top, of passageway 22c in feeding spoon 22 when the latter is snapped into place in the sliding relationship with the plug member referred to above and illustrated in the drawings. The upper wall of passageway 22c has a downward offset, or lip, 22ca near its rear end of roughly the same vertical dimension as the upstanding distance of the rim of the outer opening of neck 28a above the upper surface of the neck proper.

The upturned configuration of the outer end of neck 28a is such that that portion of the neck wall rising to form the rim at the rear of the neck opening, shown at 28aa and hereinafter referred to as neck stop 28aa, has a rearwardly facing surface such as to meet flush with the inner surface of lip 22ca, in the manner shown in FIGURE 8, as feeding spoon 22 is moved forwardly, to the left as shown in FIGURES 8 and 9, and fixes its limit of forward travel. When the spoon is thus stopped at its forwardmost position, the open end of neck 28a, as FIGURE 8 best shows, has its rim flush against the top of passageway 22c, which latter, as FIGURES 7 and 8 illustrate, is of sufficient length to completely enclose the neck, thus blocking its outer opening and preventing the escape of baby food from the baby feeder therethrough. This position of the feeding spoon, which obviously corresponds to the closed position of the baby feeder, is maintained during nondispensing use of the latter by the biasing pressure of spiral spring 30 on the spoon in a manner hereinafter to be described.

Hollow 22bb in feeding spoon 22 for stud-like projection 28b of plug member 28 is of sufficient depth to leave a space for the snug reception of spiral spring 30 between its enclosed end and the front face of the projection 28b when the feeding spoon is in its forwardmost position, all as illustrated in FIGURE 8. The space thus occupied by spiral spring 30 is of such length as to house the spring under a condition of partial compression so that it exerts enough biasing force on the feeding spoon to continually urge the latter to its FIGURE 8 (forwardmost) position. It will thus be apparent that the baby feeder is normally held in a closed position by the pressure of the captivated spring 30, and that it remains closed until the pressure from the spring is overcome by properly directed compressive force acting on it. In this connection, the spring is sufficiently strong to maintain its biasing pressure on the feeding spoon under normal handling conditions, yet sufficiently resilient to permit its easy manual compression in the below-described manner for baby feeder opening purposes.

As will now be fairly obvious, baby feeder 20 can be easily opened by sufficiently hard finger pressure on trigger 22ba to pull the latter in the direction of shoulder 28c of plug member 28 against the pressure of spiral spring 30. This trigger-pulling manipulation causes the whole feeding spoon to ride to the right, as viewed in FIGURE 8, and gradually exposes the outer opening of neck 28a as the end of the neck rides out from under the top of passageway 22c and through opening 22aa in the bowl of the spoon until the neck opening is fully exposed in the manner illustrated in FIGURE 9. Exposure of the end opening of the neck in this way permits baby food to flow from tubular container 24 into the spoon bowl under the influence of pressure exerted by coil spring 32 as a result of its inherent tendency to coil itself, and container 24, from the rear in the previously-indicated manner and as demonstrated in FIGURE 9. The resulting self-squeezing

action of the baby feeder is, as will be apparent, essentially the same as the corresponding action of container 10.

To use baby feeder 20 for feeding purposes, it is opened in the above-described way and so maintained until a desired amount of baby food has been discharged into the bowl of spoon 22a. The pressure on trigger 22ba is then released and the feeding spoon moves to the left, as viewed in FIGURE 9, until neck 28c of the plug member is withdrawn, relatively speaking, into passageway 22c, as a result of which the outer opening of the neck is again sealed by the top of the passageway in the manner described above and illustrated in FIGURE 8. The baby feeder is, of course, opened and closed as often as necessary or desirable to complete any given feeding session.

The present invention has been described in considerable detail in order to comply with the applicable patent law provisions by providing a full public disclosure of at least one of its forms. Such detailed disclosure is not, however, intended to in any way limit the broad features or principles of the invention, or the scope of patent monopoly sought to be granted. Accordingly, while the invention has been herein illustrated and described in what are conceived to be preferred and practical forms, it is emphasized that departures may be made therefrom within the scope of the invention. Certain of these departures have already been mentioned, and others will occur to those skilled in the art in the light of present teachings. Exemplary of the latter are noncritical variations of the shapes of various parts of the drawing-illustrated dispenser containers; the elimination of certain structural, or other, features of either of said dispensing containers not critically essential to proper use and functioning thereof; the addition of useful, but noncritical, accessories to the containers; etc.

As a specific example of the kind of modification contemplated above, a different type of feeding head, as, for instance, a nipple head, could be substituted for the spoon head of baby feeder 20. While such a substitution might require the application of some design ingenuity, this would, in the light of present teachings, tax no more than the ordinary expertise of one skilled in the art to which the present invention pertains. In similar vein, baby feeder 20, as well as any similar feeding embodiment of my invention, can be provided with a sanitary cover for its front (feeding) end within the scope of the invention. Such a cover can, for example, be provided for baby feeder 20 by enclosing all, or part, of its feeding spoon in a Saran boot, or the like. Such a boot can, if desired, have a tearaway tab to permit its easy removal from the baby feeder.

As previously indicated, the unique dispensing container of this invention can be employed as a dispenser for any of a variety of pasty materials, or the like. For example, it can be used for the dispensing of pastes and glues; salves and ointments; strained foods suitable for baby, invalid or astronaut usage; condiments such as mustard, catsup, or the like; etc. The consistency of the dispensed material will, of course, affect its rate of flow from the dispenser, the thinner the material, all other things being equal, the faster the rate of flow.

It is emphasized, in final summary, that the scope of my invention extends to all variant forms of its drawing-illustrated embodiments encompassed by the language of the following claim.

I claim:

1. A dispensing container particularly adaptable for the dispensing of pasty materials comprising, in combination:

(a) an elongate tubular body, crimp-closed at one end and flexibly windable into a roll from that end under the influence of a properly directed winding force;

(b) manually operable discharge means disposed at a second end of the elongate tubular body in sealing

relationship therewith and having incorporated biasing means for holding it in closed position until manually urged to an open position; and

- (c) coil spring means disposed within the elongate tubular body in such cooperative association therewith as to, in its uncoiled form, induce winding of the latter into a roll from its crimp-closed end unless opposed by a sufficiently strong resisting force to prevent such inducement;
- (d) all involved parts of the dispensing container being so physically characterized and mutually associated as to permit its elongate tubular body to hold a dispensable material in sufficient quantity to render said body longitudinally rigid and maintain said coil spring means in substantially uncoiled form therein, and to automatically dispense said dispensable material through said manually operable discharge means when the latter is urged to an open position;
- (e) the automatic dispensing of the dispensable material being effectuated by a winding of said elongate tubular body from its crimp-closed end by the coil spring means and continuing for as long as said discharge means remains open;
- (f) the aforesaid manually operable discharge means comprising, in combination:
 - (1) plug means sealingly plugging said second end of said elongate tubular body, said plug means having a passageway for the discharge of said dispensable material from said tubular body and a forwardly extending neck;
 - (2) closure means characterized by an internal passageway sized to receive the forwardly extending neck of said plug means in snugly sliding relationship, said passageway being of such length as to permit longitudinally sliding movement of the closure means along said neck, said closure means being further characterized by the presence of an opening into said internal passageway forward of its entrance opening for the neck of the plug means and intended for a purpose hereinafter disclosed; and
 - (3) power spring means;
 - (4) the plug means and closure means having confronting stop means which prevent forward movement of the latter relative to the former beyond a certain point when the two are mated in the above-indicated fashion, that is, with the neck of the plug means in the internal passageway of the closure means, and said plug means having separate stop means positioned to limit backward movement of the closure means along the neck of the plug means when the plug and closure means are so mated;
 - (5) the aforesaid opening in said closure means being so sized and located as to expose the outer end of the passageway in said plug means and thereby permit the discharge of said dispensable material from said tubular body when the closure means is urged to its rearward position along the neck of the plug means;
 - (6) said closure means having internal space to accommodate the aforesaid power spring means in captivated fashion between it and said plug means, when the closure and plug means are mated in the above-indicated fashion, whereby pressure on the spring urges the closure means to its forwardmost position along the neck of said plug means;
 - (7) all involved elements and features of the manually operable discharge means being suitably cooperative to assure closure of the discharge means when its closure means is in the aforesaid forwardmost position on the neck of the plug means, to permit the discharge of dispens-

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able material from said dispensing container when said closure means is urged to its rearwardmost position on the neck of said plug means, and to permit automatic return of the closure means to said forwardmost position 5 on the neck of the plug means upon release of the force urging it to said rearwardmost position thereon;

(8) the forward portion of the aforesaid closure means being shaped like a spoon bowl and said opening in the closure means occurring in the base portion thereof, whereby the opening of said discharge means exposes the outer end of the passageway in said plug means at a convenient point for the discharge of dispensable material from the dispensing container into the spoon bowl portion of the closure means; and 10

(9) said closure means having an integral, downwardly depending trigger designed and oriented to permit easy rearward pulling of the closure 20

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means along the neck of the plug means for quick finger control during dispensing usage of the dispensing container.

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