

Aug. 2, 1932.

H. M. GUSDORF

1,869,685

DISPENSING DEVICE

Filed Aug. 1, 1930

3 Sheets-Sheet 1

Fig. 1.

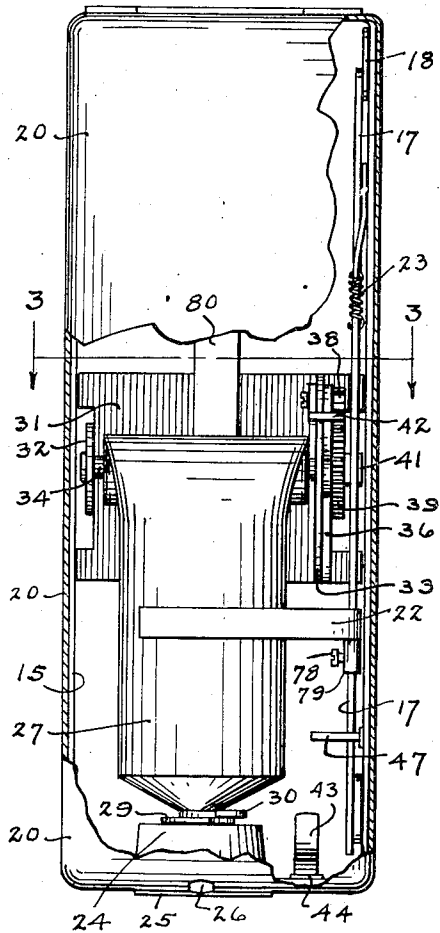


Fig. 2.

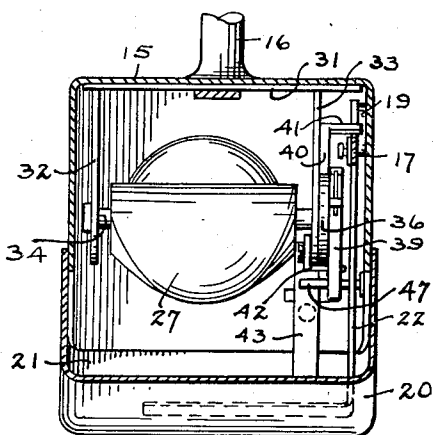
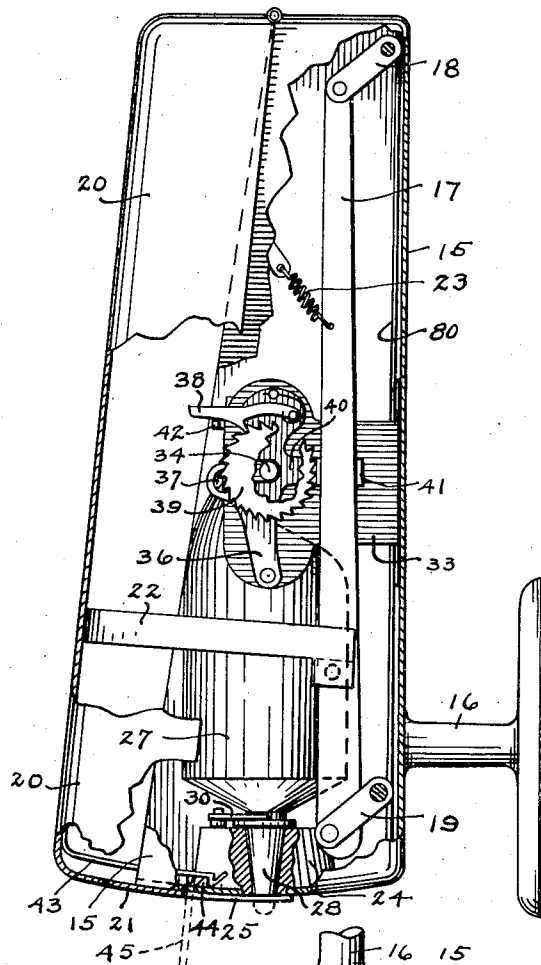
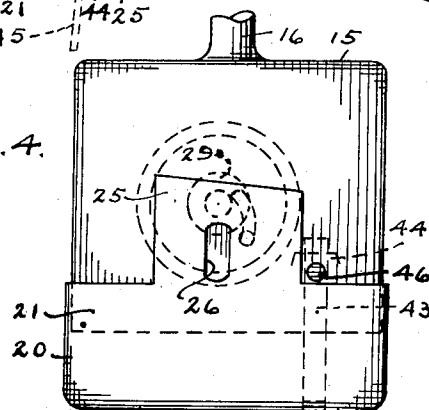


Fig. 3.

Fig. 4.



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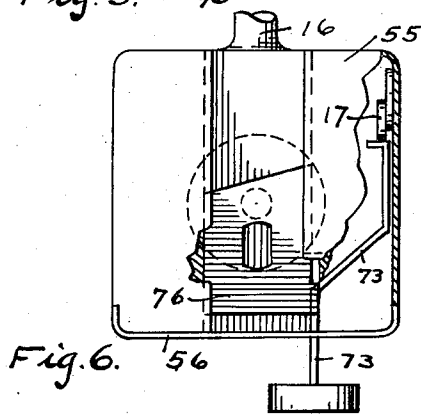
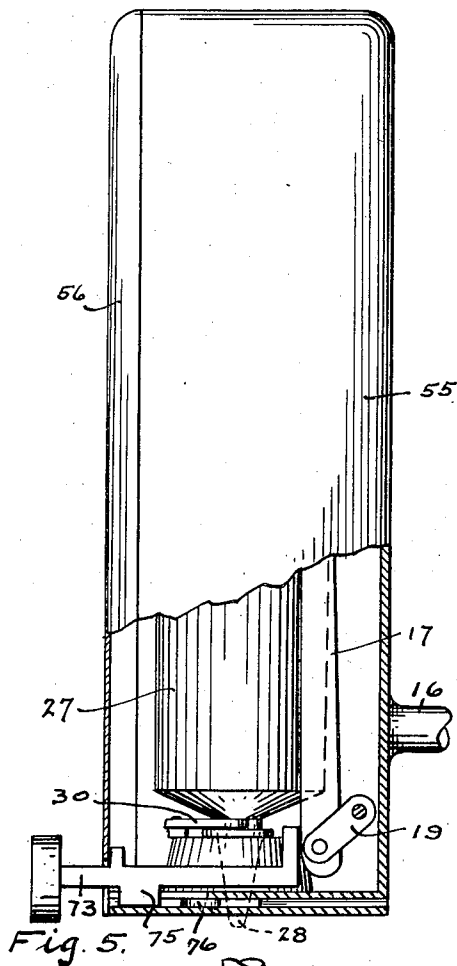
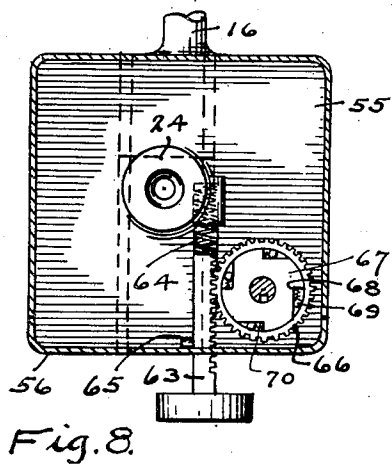
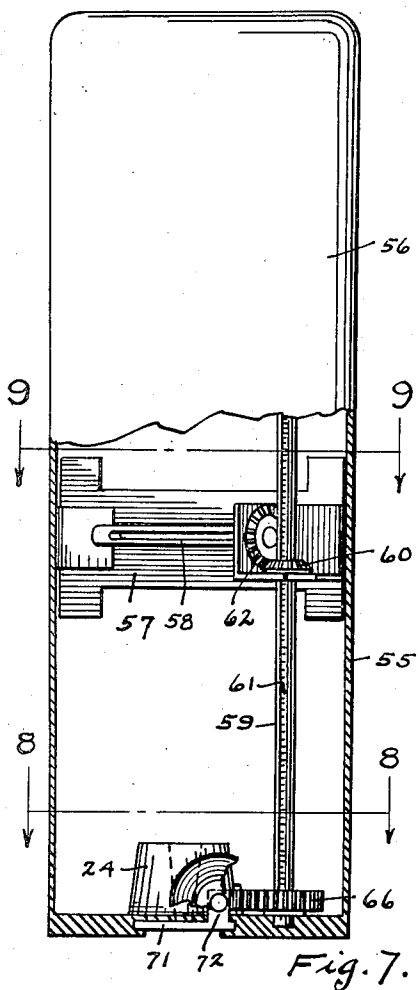
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DISPENSING DEVICE

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3 Sheets-Sheet 2



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DISPENSING DEVICE

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3 Sheets-Sheet 3

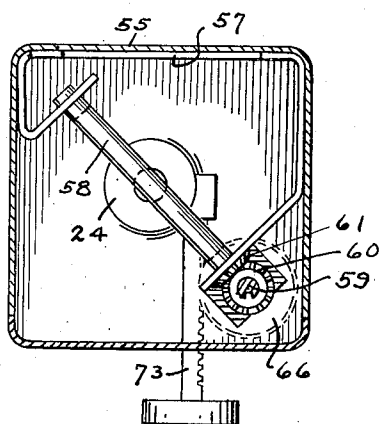


Fig. 9.

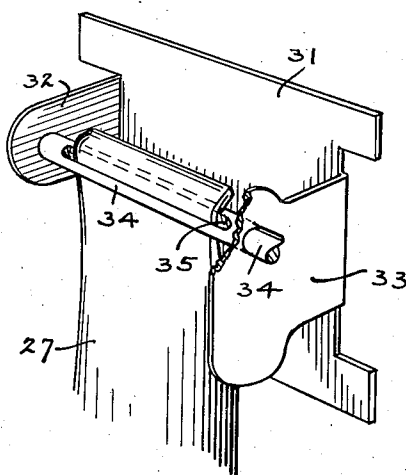


Fig. 10.

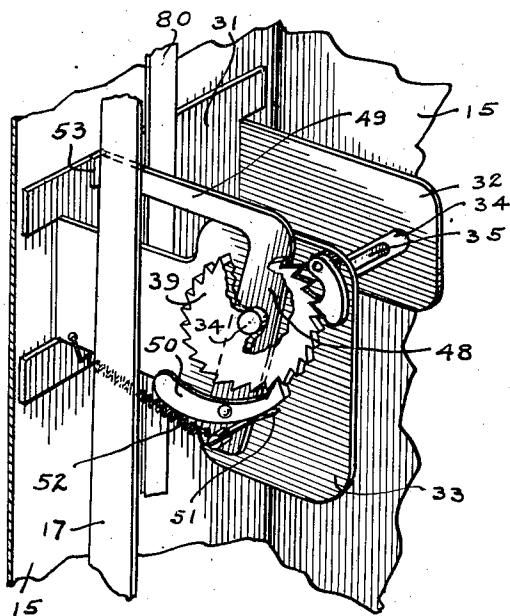


Fig. 11.

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UNITED STATES PATENT OFFICE

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DISPENSING DEVICE

Application filed August 1, 1930. Serial No. 472,231.

This invention relates to the art of dispensers and particularly to a structure for dispensing paste or cream-like substances from collapsible containers such as shaving soaps, tooth paste, library paste, and the like.

It is a primary object of my invention to provide means for positively ejecting a fixed amount of the material to be dispensed (hereinafter designated as soap as one particular medium) at each of a series of succeeding like operations from a collapsible unit until the unit is emptied.

An important object is to provide a dispensing structure adapted to receive a collapsible filler unit and adapted to be operated to press the contents from the unit in successive operations and to close the unit from the air between operations.

An important object resides in the means for initially shearing off the closed discharging end of the collapsible unit.

Still further objects reside in the means for engaging the collapsible unit and compressing the walls together; in the means for operating the compressing means from a lateral travel of a member pushed from without; and in providing for a uniform discharge from the unit at various proportions of collapse of the unit.

These and other objects will become apparent in the following description of my invention, with reference being made to the accompanying drawings, in which

Fig. 1 is a fragmentary front elevation of a dispenser embodying my invention;

Fig. 2, a fragmentary side elevation of the dispenser;

Fig. 3, a horizontal transverse section on the line 3—3 in Fig. 1;

Fig. 4, a bottom plan view of the dispenser;

Fig. 5, a fragmentary side elevation of a modified form of the dispenser;

Fig. 6, a fragmentary bottom plan view of the dispenser as shown in Fig. 5;

Fig. 7, a fragmentary front elevation of a still further modified form of the invention;

Fig. 8, a transverse section on the line 8—8 in Fig. 7;

Fig. 9, a transverse section on the line 9—9 in Fig. 7;

Fig. 10, a fragmentary perspective view of the carriage and tube engaging shaft; and

Fig. 11, a perspective view of a ratchet mechanism modified from that shown in Figs. 1 and 2.

Like characters of reference indicate like parts throughout the several views in the drawings.

Referring first to Figs. 1-4 in the drawings, I form a box 15 open from the front with a supporting bracket 16 at the rear. Along the inner right hand side, I mount a bar 17 to be pivotally supported by the side by the top and bottom links 18 and 19 respectively so that the bar normally tends to drop longitudinally toward the box bottom with a bodily movement toward the rear. A cover 20 is hinged at the top of the box to swing down over the front of the box and have its sides and lower end 21 telescope over the box and an arm 22 extends forwardly from the bar 17 to be contacted by the inner side of the cover. This arm 22 may be moved along the bar 17 to be secured thereto at any point by the set screw 78 through the flange 79. The bar 17 is normally held upwardly and outwardly by a spring, here shown as the tension spring 23, which spring not only swings the bar 17 outwardly from the back of the box 15, but also, through the arm 22, swings the cover 20 outwardly.

In the lower end of the box 15 is provided a boss 24 having a tapered hole vertically extending therethrough and the under side of the box end is arcuate with its center of curvature at the hinge of the box cover. The lid end is also arcuate to slide over the under side of the box end with a close sliding fit and has a rearwardly projecting plate 25 with a shearing edge at its rear side. An elongated hole 26 is provided in the plate 25 at the proper location whereby when the lid is in its normal outward position, the plate covers over the discharge end of the hole in the boss 24 with the elongated hole 26 forwardly thereof.

A collapsible container 27, here shown as the well known tube commonly employed to

contain "shaving cream", has a conical nipple 28 which is fitted into the hole through the boss 24 and is of sufficient length to project on through below the box end as indicated by the dash lines, Fig. 2, the nipple being hollow but closed over its end. An annular shoulder 29 is provided about the nipple above the boss over which shoulder a latch bar 30 pivoted on the boss 24 is swung to prevent withdrawal of the nipple from the hole in the boss. In this position the container extends vertically upward within the box 15 in an inverted position. The lid or cover 20 is swung away from the opening in the box during the positioning of the container in the box as above described.

I provide a carriage 31 to have its back adapted to slide vertically over the inner side of the back wall of the box 15 and under the guide strip 80. Side plates 32 and 33 extend forwardly from the back and rotatably support a shaft 34 which is provided with a longitudinal slot 35 therethrough, Fig. 10, to receive the upper flattened end of the container whereby, by revolving the shaft 34, the container may be wound around the shaft to compress the container walls together to form a flat ribbon of double thickness. On the outer face of the plate 33 is an arm 36 pivoted by its lower end to the plate, having the shaft 34 extending through a slot 37 therein, and extending above the shaft to carry a pawl 38 on its outer side. A ratchet wheel 39 is fixed on the outer end of the shaft 34 to have the arm 36 between it and the plate 33. A leg 40 extends rearwardly from the arm 36 and has an outwardly turned finger 41 positioned to pass transversely across the back edge of the bar 17 whereby rearward travel of the bar 17 will push on the finger 41 to cause the pawl 38 to engage the teeth of the wheel 39 and thereby revolve the shaft 34. To limit the rotation of the wheel, an adjustable stop 42 is carried on the plate 33 to contact the under side of the pawl 38 to hold it away from engagement with teeth of the wheel as may be desired, lowering the stop causing the pawl to engage the wheel more quickly than when raised.

The container 27 having been positioned in the box and the shaft 34 engaged over the upper end of the container, the cover 20 is swung around to close the box 15 and the shearing edge of the plate 25 comes into contact with the end of the nipple 28 projecting through the bottom of the box. The cover is pushed back to cause the nipple end to be sheared off and to cause a spring finger 43 to slide up over a stop 44 on the box end and drop down therebehind with its downturned end to prevent outward travel of the cover. By pushing the cover on in further over the box, the arm 22 is pushed to move the bar 17 rearwardly which carries the arm 36 rearwardly to have the pawl 38 revolve the wheel

39 and thus wind the container 27 around the shaft 34 a short distance whereupon the pressure thus exerted on the contents of the container causes the contents to flow out the opened end of the nipple 28, the plate 25 having moved in to have the hole 26 register over the nipple end. Release of the cover permits the spring 23 to return the parts to their normal position ready for a subsequent operation, the nipple end being then closed over by the plate 25 to exclude air therefrom and to prevent further exudation of the contents.

As the container 27 is wrapped around the shaft 34 in a collapsed condition, uniform rotation of the shaft 34 at each operation of the cover 20 would cause an increasing amount of discharge therefrom due to the increasing diameter of the collapsed tube on the shaft. To compensate for this condition, I slope the rear edge of the bar 17 to have its lower end closer to the back of the box 15 than is its top so that as the carriage 31 drops downwardly with the emptying of the container, the arm 36 is not permitted to return as far forwardly as at the upper positions and hence the pawl 38 can not engage the ratchet wheel to move it as far. When the container 27 is emptied, a rod 45, shown in dash lines, Fig. 2, may be inserted through a hole 46 in the bottom of the box 15 to raise the spring 43 above the stop 44 and thereby permit the cover to be pulled out from over the box and opened around to permit the latch bar 30 to be moved from over the shoulder 29 so that the container 27 may be lifted up to withdraw the nipple from the boss. By pulling on the lower end of the container it may be readily unwound from the shaft 34, disengaged therefrom, and a new filled container substituted therefor.

As a precaution to prevent damage to the mechanism by further operation of the cover when the container is empty, I provide a stop post 47 on the side of the box 15 to project into the path of the outer end of the pawl 38 at the proper elevation to contact the pawl and hold it up out of engagement with the wheel 39 when the container is emptied thereby preventing further rotation of the shaft 34.

In Fig. 11, is shown a slightly modified revolving means. Here the carriage 31 is reversed and the wheel 39 is on the left hand side with an arm 48 pivoted on the shaft 34 to have an extension 49 over to the operating bar 17 to receive rocking motion therefrom as before. The lower end of the arm 48 extends below the wheel 39 to carry a pawl 50 thereon having a weighted outer arm to cause the pawl to swing upwardly against the wheel. A spring 51 insures contact of the pawl with the wheel, and a spring 52 engaging this lower end of the arm 48 normally rocks the arm to maintain the extension finger 53 against the bar 17. Therefore,

when the bar 17 is moved rearwardly, the finger 53 is carried back to rock the arm 48 and cause the pawl 50 to revolve the wheel 39. A dog 54 pivoted on the plate 33 drops down to engage the teeth of the wheel to prevent return travel of the wheel 39.

In place of the ratchet mechanism in either form as above described being carried on the carriage 31, I may employ the modified form of drive for the shaft 34 as shown in Figs. 7, 8 and 9, where a box 55 with a relatively fixed cover 56 is used. A carriage 57 is slidably carried in the box and rotatably supports the shaft 58 comparable to the shaft 34. A shaft 59 is rotatably carried in the box and has a bevel gear 60 carried thereon in driving relation by engaging in the keyway 61 and is slidable therealong. The gear 60 is in constant mesh with the gear 62 fixed on the shaft 58. A plunger 63 extends through the cover 56 and is normally extended by a spring 64 to have the stop 65 on the plunger contact the inner side of the cover as a limiting element. On the side of the plunger 63 are formed teeth in the nature of a rack bar which are in constant mesh with a ring gear 66 rotatably supported around the star member 67 which is fixed on the vertical shaft 59. The star member 67 is provided with a plurality of right angled notches 68, here shown as four in number, one side of the notch being on a radius with the other side at right angles thereto. In each notch, is positioned a ball bearing 69 having a diameter slightly less than the length of the radial side of the notch and a spring 70 urges each ball outwardly into the acute angle formed between the other side of the notch and the inner face of the ring gear 66. Now as shown in Fig. 8, pushing in on the plunger 63 will revolve the gear 66, and since the balls 69 are in contact therewith, they will be wedged between the gear and the sides of the notches of the star member 67 and thereby revolve the member 67 and the shaft 59 to, in turn, revolve the shaft 58 upon which the collapsible unit is wound.

In this modified form, the under side of the box 55 is provided with a widened T-slot in which a valve plate 71 slides to close off the nipple end of the container 27. A notch is provided through the box above the plate and a neck 72 connects the plate with the plunger 63 whereby the plunger moves the plate upon actuating the shaft 58.

Referring to Figs. 5 and 6, it is possible to actuate the bar 17 by a plunger rod 73 in place of a hinged cover as shown in Fig. 1-4. The rod 73 is slidably carried through the stationary cover 56 with a connection 75 to the valve plate 76 on the under side of the box and is carried rearwardly to contact the bar 17 so that by pushing in on the rod 73, the bar 17 is moved rearwardly as above described. The plate 76 is moved across the container

nipple opening to open and close it and carries a shearing edge on its backside for the initial shearing off of the nipple end.

I claim:

1. In a dispenser adapted to dispense substances from a collapsible container, means for supporting the discharge end of the container, a container engaging shaft adapted to be revolved, a ratchet mechanism associated with the shaft, and a reciprocable member adapted to revolve said shaft through said ratchet mechanism, and retarding means for decreasing the rotary travel of said shaft at successive operations of said reciprocable member.

2. In a dispenser adapted to dispense substances from a collapsible container, means for supporting the discharge end of the container, a container engaging shaft adapted to be revolved, a ratchet mechanism associated with the shaft, and a reciprocable member adapted to revolve said shaft through said ratchet mechanism, a ratchet mechanism carrier movable longitudinally of the container, said ratchet mechanism comprising an arm pivoted to said carrier and extending past said shaft, a ratchet wheel on the shaft, and a pawl on said arm adapted to engage said wheel when the arm is moved in one direction and to pass over the wheel in the opposite direction, said arm being extended to be in the path of travel of said reciprocable member.

3. In a dispenser adapted to dispense substances from a collapsible container, means for supporting the discharge end of the container, a container engaging shaft adapted to be revolved, a ratchet mechanism associated with the shaft, and a reciprocable member adapted to revolve said shaft through said ratchet mechanism, a plate through which said shaft rotatably projects by one end, said ratchet mechanism comprising an arm pivoted on the shaft, a ratchet wheel fixed on the shaft, a pawl pivotally carried by the arm to engage said wheel, and a dog pivoted to said plate adapted to engage said wheel to prevent travel thereof in the direction opposite to that produced by said pawl, said arm being extended to carry a finger positioned in the path of said reciprocable member.

4. In a dispenser, a support, a collapsible container carried by the support, a nipple on the discharge end of the container adapted to project slightly beyond the support, an operating member, means for collapsing the container in intermittent steps actuated by the operating member, and a plate having a shearing edge moved by said operating member adapted to cut off the projecting end of said nipple.

5. In a device for dispensing substances from a collapsible container, a container support, a bar longitudinally of the support, a link toward each end of the bar pivotally

supporting the bar, a container engaging shaft, ratchet means for revolving the shaft in one direction, an arm extending from the ratchet means, and a finger on the arm in the path of travel of the said bar, said bar having an edge contacting said finger sloping rearwardly and downwardly whereby the arm is permitted to return a decreasing distance upon successive reciprocating movements of the bar as the finger may travel downwardly therealong.

6. In a device for dispensing substances from a collapsible container, a container holder, a carriage slidably carried by the holder, a shaft revolvably carried by the carriage, said shaft being adapted to engage said container, a reciprocable member, means interconnecting said shaft and said member to revolve the shaft upon movement of the member, and means for changing the rate of the travel of the shaft with constant travel of the operating member.

7. In a dispenser, a support, a collapsible container carried by the support, a nipple on the discharge end of the container adapted to project slightly beyond the support, an operating member, and a plate actuated by the operating member having a shearing edge adapted to cut off the projecting end of said nipple.

8. In a dispenser, a support, a collapsible container carried by the support, a nipple on the discharge end of the container adapted to project slightly beyond the support, an operating member, and a plate actuated by the operating member having a shearing edge adapted to cut off the projecting end of said nipple, and said plate having a hole there-through back of said edge through which the contents of the container may be discharged upon registration of the hole with the opened end of said nipple.

9. In a device for dispensing substances from collapsible containers, a container box, a carriage slidable longitudinally of the box, a guide retaining the carriage in the box, a transverse shaft revolvably carried by the carriage and having means to engage said container, a reciprocating member extending longitudinally of the box, means interposed between the transverse shaft and said member for transforming reciprocating motion of the member to rotary motion of the shaft, said means being limited to cause rotary motion of the shaft in one direction only, a cover on said box, an arm extending from the reciprocating member to contact the inner side of the cover, and spring means resisting movement of said member.

10. In a device for dispensing substances from collapsible containers, a container box, a carriage slidable longitudinally of the box, a guide retaining the carriage in the box, a transverse shaft revolvably carried by the carriage and having means to engage said

container, a reciprocating member extending longitudinally of the box, means interposed between the transverse shaft and said member for transforming reciprocating motion of the member to rotary motion of the shaft, said means being limited to cause rotary motion of the shaft in one direction only, a cover on said box, an arm extending from the reciprocating member to contact the inner side of the cover, and spring means resisting movement of said member, and means for securing said arm at various positions along said member whereby the member is moved various distances by the cover travel.

11. In a dispenser adapted to dispense substances from a collapsible container, means for supporting the discharge end of the container, a container engaging shaft adapted to be revolved, a ratchet mechanism associated with the shaft, and a reciprocable member adapted to revolve said shaft through said ratchet mechanism, a ratchet mechanism carrier movable longitudinally of the container, said ratchet mechanism comprising an arm pivoted to said carrier and extending past said shaft, a ratchet wheel on the shaft, and a pawl on said arm adapted to engage said wheel when the arm is moved in one direction and to pass over the wheel in the opposite direction, said arm being extended to be in the path of travel of said reciprocable member, and a stop post in the path of said pawl to hold the pawl out of engagement with the wheel upon said shaft nearing the discharge end of said container.

12. In a dispenser adapted to dispense substances from a collapsible container, means for supporting the discharge end of the container, a container engaging shaft adapted to be revolved, a ratchet mechanism associated with the shaft, and a reciprocable member adapted to revolve said shaft through said ratchet mechanism, a plate through which said shaft rotatably projects by one end, said ratchet mechanism comprising an arm pivoted on the shaft, a ratchet wheel fixed on the shaft, a pawl pivotally carried by the arm to engage said wheel, and a dog pivoted to said plate adapted to engage said wheel to prevent travel thereof in the direction opposite to that produced by said pawl, said arm being extended to carry a finger positioned in the path of said reciprocable member, and a stop post in the path of said pawl to hold the pawl out of engagement with the wheel upon said shaft nearing the discharge end of said container.

13. In a dispenser adapted to dispense substances from a collapsible container, a container support, a bar carried by the support longitudinally of the container to be movable in parallel relation thereto, a shaft adapted to engage said container, a ratchet mechanism engaging said shaft, an arm extending from said mechanism to said bar, and an

operating member adapted to move said bar to actuate said ratchet mechanism through said arm whereby said shaft may be revolved to wrap said container therearound, and dis-
 5 engaging means intercepting said ratchet mechanism for arresting the action of said ratchet mechanism when substantially all of said container has been wrapped around said shaft.

10 14. In a device for dispensing substances from a collapsible container, a container box, a cover hinged to the box, a container engaging member, spring means normally swinging the cover away from the box, mechanism be-
 15 tween said cover and said engaging member for transforming reciprocating motion of the cover into rotary motion of the said member, and releasable catch means limiting the travel of the cover away from the box.

20 15. For a dispensing device, a container holder having a bore through a base thereof with a relatively long taper and a seat at the upper end of the bore, a latch bar reciprocable over the seat, a collapsible container,
 25 means for collapsing the container, a rigid tapered nipple extending from one end of the container adapted to fit snugly in said dispenser bore, and a laterally projecting shoulder on the nipple spaced outwardly from the
 30 container end to leave a recess between the shoulder and the container end to receive said latch bar within the recess to retain the shoulder against said seat and prevent withdrawal of the nipple from said bore while said con-
 35 tainer is being collapsed, and a nipple end cover cooperating with said collapsing means.

16. In a device for dispensing substances from collapsible containers, a container support adapted to removably hold the dis-
 40 charge end of the container, a transverse shaft about which the container may be wound from its other end, a reciprocable member carried to extend longitudinally of the container when mounted in said support,
 45 means interposed between said shaft and said member for transforming reciprocating motion of the member into rotary motion of the shaft, and an operating member connecting with said reciprocable member.

50 17. In a device for dispensing substances from collapsible containers, a container support adapted to removably hold the discharge end of the container, a transverse shaft about which the container may be wound from its
 55 other end, a reciprocable member carried to extend longitudinally of the container when mounted in said support, means interposed between said shaft and said member for transforming reciprocating motion of the
 60 member into rotary motion of the shaft, and an operating member connecting with said reciprocable member, said means being shifted by said shaft longitudinally of said member as the container is wound around the
 65 shaft.

18. In a dispenser, a collapsible tube, a nipple on the tube initially integrally closed across its discharge end, means carried by the dispenser removably engaging said nipple to have the closed end extend therefrom, a plate
 70 reciprocably carried by the dispenser to travel across the discharge end of the nipple, a nipple shearing edge on said plate, said plate having a discharge orifice through it back of said edge, means for collapsing said tube to
 75 tend to cause the contents thereof to be discharged through said nipple, and an operating member interconnecting with said plate and said collapsing means whereby move-
 80 ment of the operating member will initially carry the shearing edge of the plate through the nipple to provide an opening therefrom and further movement will shift the plate to have the orifice therethrough register with the nipple opening to permit discharge from the nipple through the orifice as the collaps-
 85 ing means is being operated.

19. In a device for dispensing substances from a collapsible tube, a shaft adapted to have the tube wound therearound, a ratchet mechanism engaging said shaft, a recipro-
 90 cable member engaging the ratchet mechanism to cause rotation of the shaft upon reciprocation of the member, said mechanism being carried by the shaft along said member as the tube is wound around the shaft, and a post in the path of said mechanism located to intercept the ratchet mechanism upon a pre-
 95 determined winding of the tube and hold it inoperative to prevent further rotation of the shaft upon further reciprocation of the said member.

In testimony whereof I affix my signature.
 HAROLD M. GUSDORF.

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