

May 10, 1966

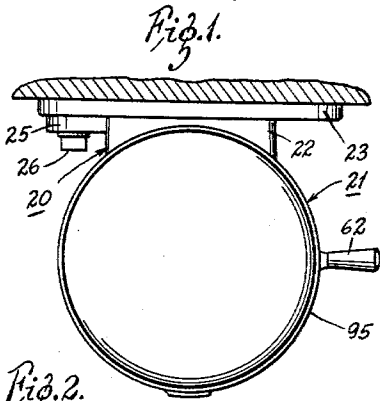
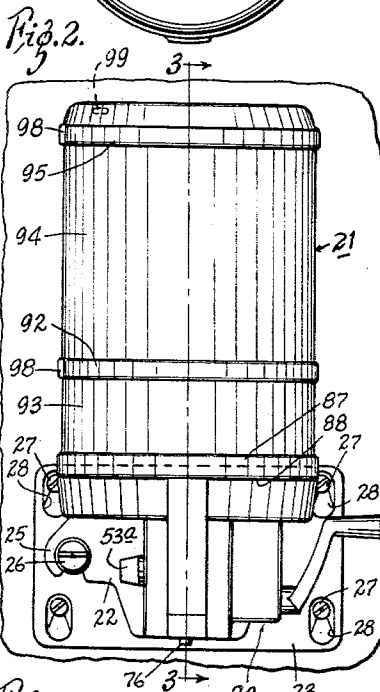
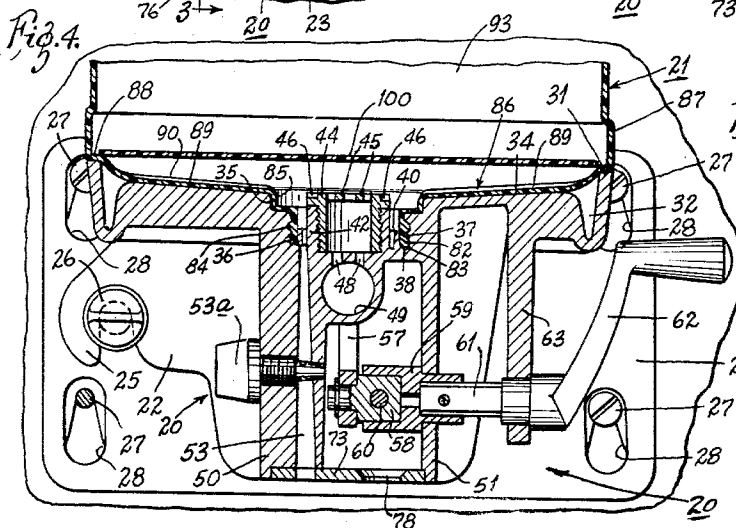
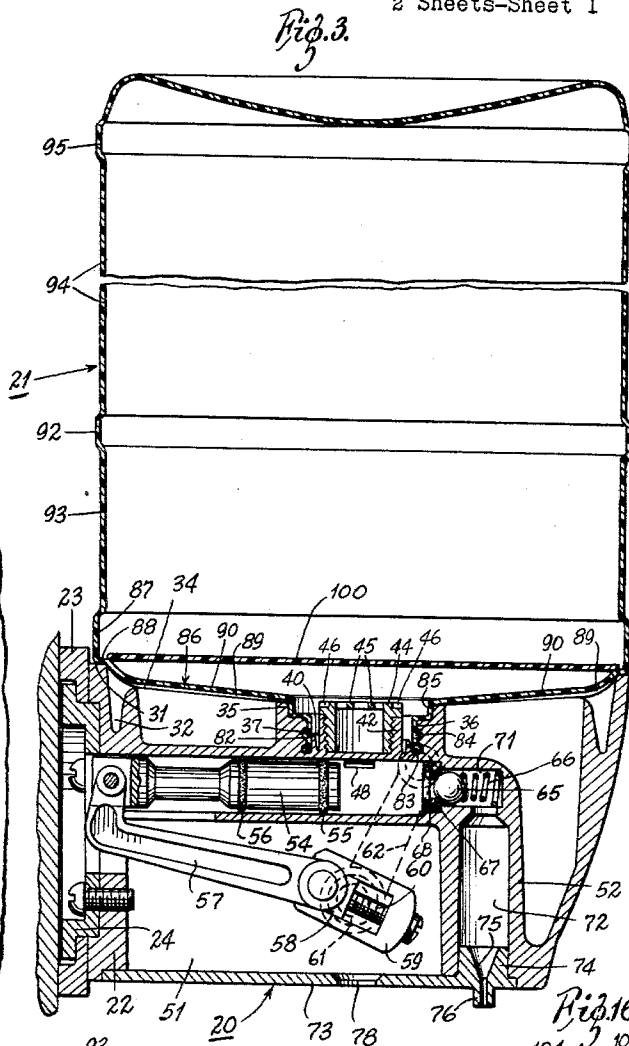
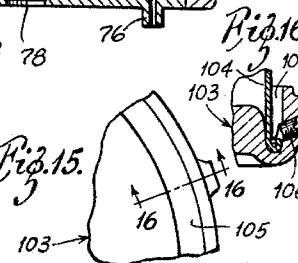
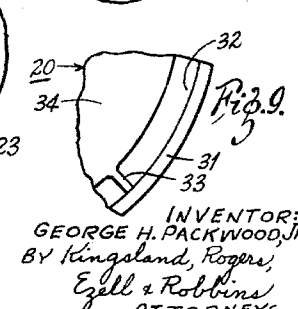
G. H. PACKWOOD, JR

3,250,438

FLUENT MATERIAL DISPENSER WITH BOTTLE-TYPE MATERIAL CONTAINER

Filed June 12, 1964

2 Sheets-Sheet 1



INVENTOR:
GEORGE H. PACKWOOD, JR.
BY Kingland, Rogers,
Ezell & Robbins
ATTORNEYS

May 10, 1966

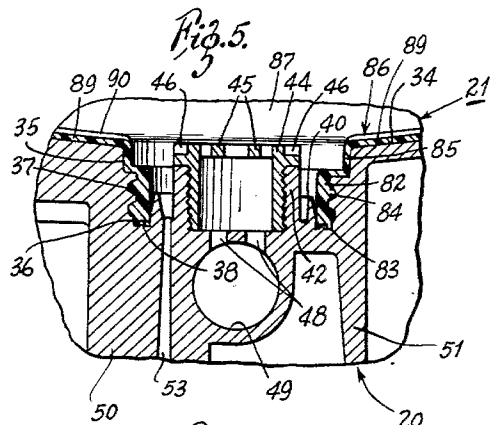
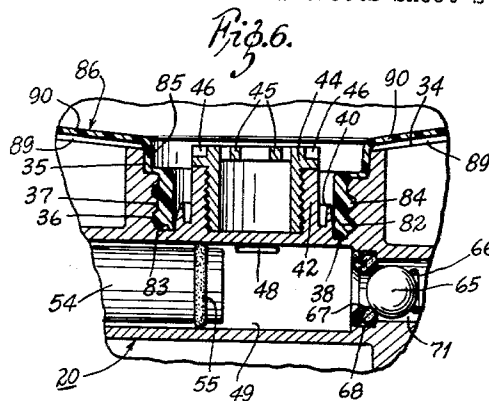
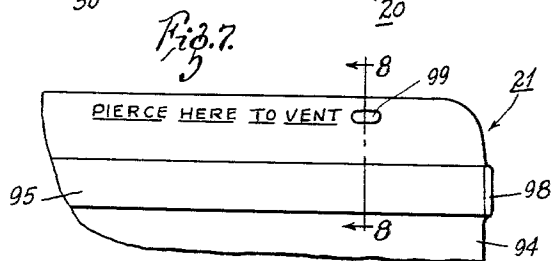
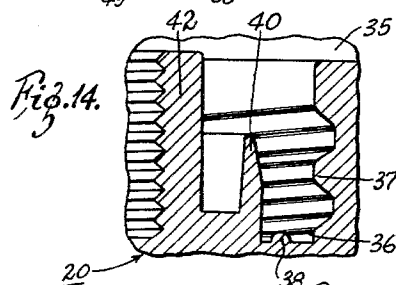
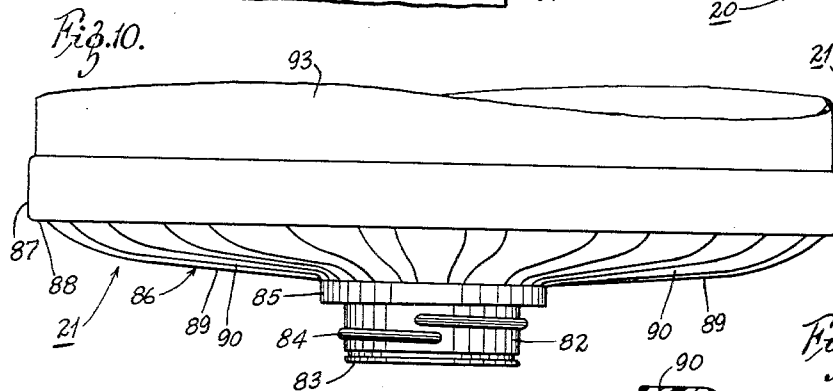
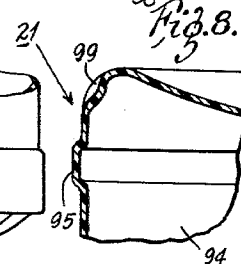
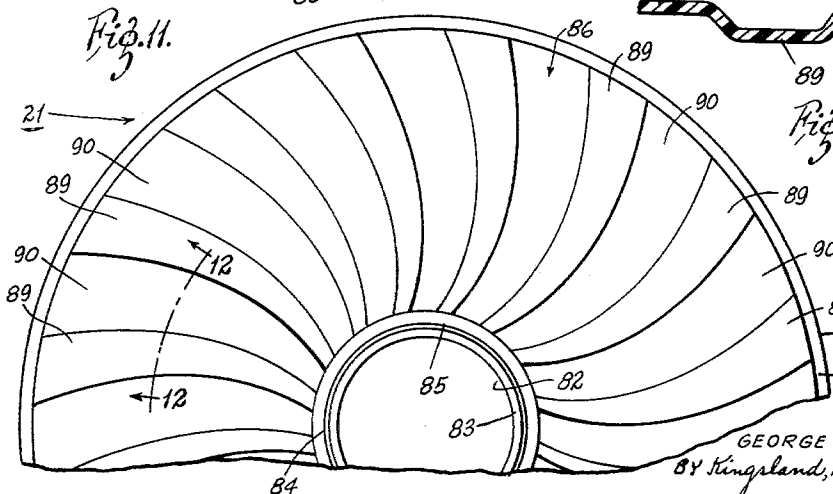
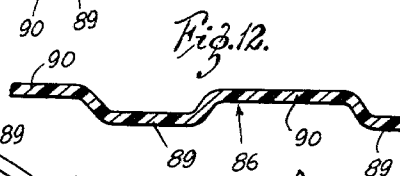
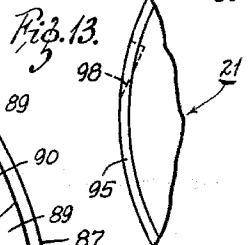
G. H. PACKWOOD, JR

3,250,438

FLUENT MATERIAL DISPENSER WITH BOTTLE-TYPE MATERIAL CONTAINER

Filed June 12, 1964

2 Sheets-Sheet 2



INVENTOR:
GEORGE H. PACKWOOD, JR.
BY Kingsland, Rogers, Egell & Robbins
ATTORNEYS

1

2

3,250,438

FLUENT MATERIAL DISPENSER WITH BOTTLE-TYPE MATERIAL CONTAINER

George H. Packwood, Jr., Glencoe, Mo., assignor to G. H. Packwood Manufacturing Company, St. Louis, Mo., a corporation of Missouri

Filed June 12, 1964, Ser. No. 374,614

23 Claims. (Cl. 222-181)

The present invention relates to a dispenser for fluent material such as pastes, gels, creams, lotions and liquids of various types, in particular, liquid and semi-liquid soaps, hand lotions, face and body creams, waterless skin cleansers, shaving creams, tooth pastes and the like.

This invention contains improvements over that disclosed in co-pending application Serial No. 253,587, filed by the applicant on January 24, 1963, now Patent No. 3,178,059.

As in the former application, this invention includes a dispenser base that can be mounted upon a wall or other suitable support, for quick removal, or for inversion without removal. The dispenser base includes a reciprocating plunger operating within a cylinder by a rotatable crank. An adjusting means is provided for adjusting the throw of the crank and hence the stroke of the plunger.

In the present case, the plunger advances on its pressure stroke to close to the end of the cylinder, so it can eject substantially all of the contents of the cylinder past an outlet check valve and to a discharge orifice. On the suction stroke, the plunger moves backwardly in the cylinder until it passes across inlet ports. In its initial withdrawal movement, it pulls a vacuum in the cylinder so that as it finally crosses the inlet port, the material from the receptacle is drawn in to relieve the vacuum and fills the cylinder. With this arrangement there is only a minimum of vapor lock possibilities in the plunger operation, and it is an object of the invention to minimize this vapor lock by causing the plunger to move substantially to the end of the cylinder on the pressure stroke.

The material is delivered to the inlet ports from a bottle-like receptacle, preferably a plastic bottle. This bottle is stabilized by being threaded into the dispenser around a relatively narrow neck coaxial with the inlet port. The top shoulder of the bottle is supported by a top surface on the base, and also by a surface at the periphery. Also, means are provided to minimize any tendency of the plastic bottle to cavitate or collapse after the bottle has been filled with product and kept in storage over a period of time and also to be distorted out of shape, as when it cools in the mold, so that it is assured of a fit when it is mounted upon the shaped upper part of the dispenser base. Specifically, the foregoing is accomplished by means including ribs on the top shoulder of the bottle. Additionally, the bottle has panel-like ribs around it. They include circular rib channels that stiffen the bottle, and also divide its surface into panels suitable for labelling, and with indexing for aligning the bottle in a labelling machine.

The plastic bottle can be made of the usual plastic materials. Preferably it is made translucent so the quantity of material inside is always ascertainable. It can be formed of one of the polyethylene types of plastic which are somewhat flexible and light in weight and not subject to permanent injury when struck.

The bottle has a depression provided adjacent its bottom through which a piercing tool may penetrate the wall of the bottle to provide a vent opening.

The threads on the bottle and the neck portion are particularly designed to prevent over-twisting, and causing the bottle to slip a thread, in which condition leakage might result or the seal between the bottle and the dispenser base become broken. This seal is provided so that the pumping operation of the plunger can function. The

threading arrangement combines an end seal for the neck of the bottle and a back-up wall opposite the threads to prevent deformation of the plastic of the neck when extra torsion is applied to the threads.

Additional objects of the invention other than those embodied in the foregoing explanation will appear in the description to follow.

In the drawings:

FIGURE 1 is a top plan view of the dispenser mounted on a wall;

FIGURE 2 is a front elevation of the dispenser shown in FIGURE 1;

FIGURE 3 is a vertical front-rear section taken on the line 3-3 of FIGURE 2, this figure being enlarged over the scale of FIGURES 1 and 2;

FIGURE 4 is a transverse sectional view of the lower part of the dispenser taken through the axes of the handle and of the inlet;

FIGURE 5 is a further enlarged fragmentary transverse section, similar to FIGURE 4, through the inlet elements of the dispenser;

FIGURE 6 is a further enlarged fragmentary fore-and-aft sectional view, similar to FIGURE 3;

FIGURE 7 is an enlarged view of a bottom portion of the bottle to illustrate the vent dimple;

FIGURE 8 is a section on the line 8-8 of FIGURE 7;

FIGURE 9 is a fragmentary top plan view of the rim of the dispenser base;

FIGURE 10 is an elevational view of the top part of the bottle in inverted position;

FIGURE 11 is a fragmentary view of the top of the bottle in plan;

FIGURE 12 is an enlarged section taken on the line 12-12 of FIGURE 11;

FIGURE 13 is a fragmentary bottom view of the bottle showing an indexing notch;

FIGURE 14 is an enlarged fragmentary sectional view particularly illustrating the thread seal means;

FIGURE 15 is a fragmentary plan view of a base with means to secure a can in place; and

FIGURE 16 is a section on line 16-16 of FIGURE 15.

The dispenser includes generally a dispenser base 20 and a material receptacle or container 21 designed to hold fluent material to be dispensed. These components may be made of any appropriate material, but are here illustrated as formed of Delrin plastic and polyethylene, respectively.

As illustrated, the dispenser base 20 has a vertical back wall 22 rotatably attached to a wall plate 23. The attaching means includes a circular flanged retainer element 24 attached by screws and seated in a circular recess in the back of the wall 22. The flanged part of the retainer is fitted through a circular hole in the wall plate 23, thereby holding the dispenser base into the wall plate but permitting the base 20 to be rotated in place from upright to inverted position. The back wall 22 has a hook extension 25 engageable over a thumb screw 26 designed to limit the rotation of the base 20 to an upright position. The screw 26 can be tightened to secure the base.

The plate 23 may be rectangular and can be held onto the wall by screws 27 operating in keyhole slots 28. The screw 27 at the lower left in FIGURE 4 is shown in section to permit illustration of the tapering walls of the upper part of each slot 28. By this arrangement, the whole dispenser can be lifted off the wall by freeing the wall plate 22 from the heads of the screws 27. When replaced, the tapered slots engage onto the screws 27 with a wedging action, giving a very firm, secure placement. Also upon release of the thumb screw 26, the dispenser can be rotated around to revert the container 21. These parts do not need to be described in detail, since they are set forth in the other application previously identified.

3

The dispenser base 20 includes a top surface upon which the container 21 is mounted, which is generally like the one in the earlier application. It includes a peripheral rim 31, surrounding a groove 32. This groove is useful for retaining a cylindrical can, as illustrated in the earlier application, and as shown in FIGURES 15 and 16 later to be described, but here the channel is bridged by webs 33 (FIGURE 9), to prevent attachment of a can. The top surface 34 inside the groove 32 is dished down to a bottle-neck receiving recess complex, at the lowermost part of the surface 34. This complex includes a shouldered recess 35, from which a smaller concentric recess 36 extends downwardly with coarse threads 37 in its outer surface. The bottom of this recess 36 has an upstanding rounded circular sealing ridge 38 rising from its bottom (see especially FIGURES 5, 6, and 14), and spaced inwardly from the ridge 38 there is an upstanding, circular backup wall 40. Preferably the backup wall 40 has a taper toward its upper edge to make the circular groove between it, and the threads 37 converge toward the bottom. The wall 40 is high enough to extend opposite at least the lower threads.

In the center axis of the dispenser base 20 and concentric with the walls and recesses just described, there is provided an inner vertical circular wall 42, with inside threads into which an inlet fitting 44 is screwed. This fitting has grill-like ribs 45 across its upper end so that the fluent material can pass downwardly toward the cylinder, but trash and the like cannot. As shown by FIGURES 5 and 6, the upper periphery of the threaded inlet fitting or cap 44 can be provided with notches 46 to receive an appropriate wrench for threading the fitting into place. It also may be made of plastic material, such as Delrin.

The circular wall 42 into which the fitting 44 is threaded has a plurality of elongated openings 48 in its bottom wall. These inlet slits 48 open into a horizontal cylinder 49. The cylinder 49 is formed integrally in the base 20 below the top surface thereof, and it is flanked by two depending, spaced, vertical side walls 50 and 51. These side walls come together at the front to form a front 52 that contains a vertical dispenser passage to be described. The wall 50 has a vent passage 53 opening down from within the wall 40, and controlled by a valve 53a.

Reciprocable in the cylinder 49 there is a piston 54 having fore and aft O-rings 55 and 56 around it. The forward O-ring 55 moves across the inlet slits or ports 48. Their long narrow shape reduces the tendency of the ring 55 to spread into the ports and be injured by being forced across them. This O-ring 55 is not necessary when creams or fairly viscous lotions are dispensed, for piston 54 has small clearance between it and the cylinder wall 49. The piston is reciprocated by a crank means, comprising here a pitman or connecting rod, a crank arm, a crank shaft and a handle, and also incorporating an adjustment means.

The piston is reciprocated by a crank mechanism, including a connecting rod, a crank block, a crank shaft, and a crank handle. The back end of the piston 54 is connected to a pitman or connecting rod 57. As in the earlier application, the pitman 57 is pivotally attached to an adjustable block 58 movable in a bifurcated crank arm 59 by operation of a screw 60. The crank arm 59 is rotatably mounted in the side wall 51. The outer end of the crank arm 59 is connected to a crank shaft 61 on a crank handle 62 that is rotatably supported in a depending integral bracket 63 formed on the dispenser base. By this arrangement rotation of the crank handle 62 causes reciprocation of the piston 54 from a retracted or back position illustrated in FIGURE 3 to a forward position where the forward end of the piston is at the forward end of the cylinder. Adjustment of the screw 60 changes the length of the stroke of the piston. Preferably the entire crank and piston structure are made of plastic, except for the

4

screws, pivots and O-rings, whereby the parts may be light in weight and durable.

The forward end of the cylinder 49 receives a discharge check valve means (FIGURES 3 and 6). It includes a ball 65 urged by a spring 66 into engagement with the valve seat 67 confined within a ring-shaped fitting 68 press-fitted into a reduced cylindrical extension of the cylinder 49. This arrangement permits the valve parts to be inserted from the open end of the cylinder 49.

The ball and spring are in a horizontal continuation 71 of the cylinder 49. Desirably the cylinder 71 can have three or four longitudinal ribs angularly spaced around the cylinder wall to space the ball 65 away from the wall and permit flow of material past the ball. The cylindrical continuation 71 connects with a vertical outlet passage 72 opening out the bottom of the base 20. It is understood that the arrangement of the check valve in the other application can be used, which locates the ball valve, seat, and spring in the passage 72. However, the arrangement illustrated here is better, since it increases the amount of vacuum, even when the passage 71 is made smaller.

A bottom plate 73 (FIGURES 3 and 4) is attached between the bottom edges of the side walls 50 and 51. It has a boss 74 on its forward end that fits up into the passage 72, and has a funnel-shaped discharge opening 75 through it. The bottom of the plate has a nipple 76 through which the discharge passage opens. The nipple projects below the bottom of the plate and prevents drops of fluent material from running across the bottom plate. The opening in 76 is accurately dimensioned and shaped so as to take advantage of the surface tension and bridging action of a liquid such as water so that there will not be any drip when the dispenser is not in use and the piston 54 is not in motion. Also there is no drip when the dispenser is subjected to vibration. Typically the vertically wallled part of the opening can be $\frac{3}{4}$ " across. It may be $\frac{3}{8}$ " wide and .35" in vertical dimension. The plate 73 has an access opening 78 that makes the adjusting screw 60 accessible.

The bottle 21 is generally cylindrical in its preferred form. In any case, it needs to have a neck in the form to be described, and a shoulder that will engage the outer parts of the base 20 to make the bottle secure. The top of the bottle (inverted in the drawings) includes a central threaded neck 82. (See FIGURES 10 and 11.) Its outer end is flattened to give a surface 83 that can seal against the ridge 38. There are threads 84 on the neck 82. Typically, the bottle may have a diameter of $6\frac{1}{4}$ ", a height of $9\frac{1}{2}$ ", and a neck diameter of about $1\frac{3}{8}$ ". There are six threads per inch. These dimensions are only for illustration.

Above the threaded portion of the neck 82 of the bottle, there is a somewhat larger shoulder portion 85 that fits with the complementary recess 35, to aid in stabilizing the bottle in position. The dished surface 34 on the top of the base 20 is complementary to a convex shoulder part 86 of the bottle 21. This dished surface is sufficient to permit adequate drainage of product from the bottle 21 so that it will completely empty. The outer periphery of the bottle has an outstanding circular rib 87, the bottom of which forms a stabilizing edge 88 to engage upon the outer periphery or rim 31 of the base.

The top of upper shoulder 86 of the bottle is formed with a plurality of curved outstanding ribs 89, alternated with grooves 90, as shown in FIGURES 11 and 12. These are designed to give maximum strength to the top of the bottle and prevent cavitation or collapse after the bottle has been filled with product and kept in storage over a period of time. It can be recognized that the shoulder 86 must retain its dished shape to insure that when it is installed on the base in inverted position, all of the contents will flow toward the center and the neck to be dispensed. The ribs also keep the shoulder from excessive distortion when cooling in the mold. Fixing the

5

contour of the shoulder 86 also aids in assuring that the bottle will fit securely onto and all around the top of the base 20.

The bottle has an intermediate circular concave or convex rib 92. This provides a lower panel 93 and an upper panel 94, the top of which is limited by another rib 95. These ribs also aid in improving the strength against collapse of the bottle, especially if a strong pressure difference between the outside and the inside of the bottle is created. They also provide guides for location of labels. Preferably the panel 93 is kept free of labels, so as to provide a sighting space through which the user can see whether the container is empty.

The two ribs 92 and 95 can have ramps or notches 98, as shown in FIGURES 2 and 13, to index application of labels. Each notch provides a straight wall at one end, against which the indexing mechanism of a labelling machine may engage to give proper angular disposition of the label on the bottle.

At the bottom of the bottle 21 there is a vent dimple 99 indented in the bottle wall. This is designed to receive and guide a sharp tool that can pierce a hole through the wall of the bottle after the bottle is installed on the dispenser base.

When a slow-flowing gel or paste is dispensed, a sheet of plastic or other material forming a baffle 100 is located in the bottle 21 (FIGURES 3 and 4). It can be made of a plastic material capable of being folded so that it can be inserted through the neck of the bottle and will expand therein to extend substantially across the interior of the bottle, leaving only enough space around the edges to insure free descent of the baffle through the bottle. A wax-like material can also be poured into the bottle which will form, on cooling, a thin, uniform disk. This baffle must be located in the bottom of the upright bottle, and when the bottle is inverted, it must remain on the top of the material in the bottle, descending as the material is dispensed.

When the base 20 is to be used with a tin can, the ribs 33 (FIGURE 9) are omitted and the arrangement can be as in the earlier application. In FIGURES 15 and 16 an improvement is illustrated. There the base 20, otherwise the same as before, is shown fragmentarily at 103. The can 104 is fitted down into the groove 105, which has a rounded bottom so that the can rim can seat snugly and sealingly therein. An angularly disposed Allen screw 106 has a pointed end, and is threaded into an angular hole so that it can be turned down to bear upon the can rim, insuring a seal and good security.

INSTALLATION AND USE

The base 20 is mounted upon the plate 23 by means of the flanged plate 24 and therefore will be rotatable about the center of the flanged plate 24. The screws 27 are properly located on the wall or other support, so that the plate 23 can be hooked over them quickly.

The center of gravity is such and the dispenser is so evenly balanced that it is not necessary to tighten the screws 27 against the wall plate 23 and yet the crank handle 62 can be turned and product dispensed without causing the dispenser to shimmy or shake. This result is obtained because the screw slots in the wall plate 23 are wedge-shaped and therefore the weight of the dispenser securely urges the top of the wall plate 23 out against the heads of the upper screws 27 and forces the lower part of the plate 23 against the wall.

The screw heads should have a free clearance from the wall plate 23. Then, without the use of a screw driver or other tool, the dispenser can be easily and quickly lifted from the wall and screwed into the bottle 21 when the bottle is in the upright position. After this the dispenser can again be hooked over the screws 27 and product can be at once dispensed. Also the dispenser can be carried to other locations and operated. Alternatively to the foregoing, the thumb-screw 26 may be loosened with the

6

dispenser base secured to the wall, and the base can be rotated 180° until it is inverted from the position illustrated on Sheet 1.

A bottle 21 filled with the fluent material, paste, cream, lotion or liquid, or the like, to be dispensed, is, in upright position, threaded into the inverted dispenser base.

When paste or gel-like materials are to be dispensed, it is not necessary to loosen the thumb-screw 26 and rotate the dispenser base 180° until it is inverted from the position illustrated on Sheet 1, for it is only necessary to up-end the bottle 21 and thread it into the dispenser base 20.

In all cases, when the bottle is screwed into the base, the neck 82 of the bottle fits into the threads 37 of the base, and the threads on the bottle engage down into the circular recess between the threads 37 and the backup wall 40. When the bottle reaches the bottom of this recess or slot, its outermost edge 83 engages the ridge 38 and is caused to seal thereagainst, the threads forcing the bottle against this ridge. In this action the backup wall 40 prevents the somewhat flexible neck portion of the bottle from being distorted inwardly toward the center axis, and thereby prevents it from being slipped off the threads. Hence, the rigid and closely-fitting walls on opposite sides of the bottle neck securely hold the bottle, enabling it to be turned firmly down onto the sealing ridge 38 and its resiliency and flexibility permit it to make a tight seal in the groove and on the ridge 38.

At the same time, the shoulder 85 on the bottle is drawn securely onto the complementary shouldered recess 35. Also the upper shoulder 86 of the bottle, with the ridges 89, seats over the complementary dished upper surface 34 of the dispenser base. In this seating and attachment of the bottle, the outer rim 88 of the bottle seats against the shoulder 31 on the base 20 and forms a stable support for the outer edge of the bottle.

When the foregoing seating is effected, the combination of the dispenser base 20 and the bottle 21 is then turned 180°, reverting the dispenser base and inverting the bottle. The user applies an awl, knife blade, pin or other penetrating device to the vent dimple 99, producing a small opening in the top of the bottle. Obviously, the vent opening could be at another place in the upper part of the bottle, but the one indicated is desirable because it is accessible and because the bottle is relatively rigid at this point, facilitating the piercing action.

After the bottle is vented and only if a paste or gel-like material is in the bottle 21, then in that case thumb-screw valve 53a is turned and this allows air to be expelled through vent opening 53 and when the air has been expelled, then the thumb screw valve 53a is tightened and no product can thereafter pass through the vent opening 53. When lotions or liquids are in the bottle 21, the thumb-screw valve is not touched, but is left closed for any trapped air will be channelled through the mass in the bottle and will escape through the vent hole 99 at the top of the bottle. If the user does not wish to use the thumb-screw valve 53a to quickly expel the trapped air, then he can turn the crank handle 62 and the piston 54 will expel the air.

The fluent material such as a paste, cream, liquid or a semi-liquid lotion, gel or the like, can flow through the gratings 45 in the inlet fitting 44.

The operation of the dispenser, in brief, consists of rotating the crank handle 62 to effect reciprocation of the piston 54. The very positive suction obtained by operating the piston 54 sucks the product from the bottle 21 down through the gratings 45, through the ports 48, and into the cylinder 49, and the forward motion of the piston 54 forces the product past the valve 65 and the product is discharged at the nipple 76.

When the user operates the handle 62, this causes reciprocation of the plunger 54 within the cylinder 49. As the plunger moves forward from the position shown in FIGURE 3, it expels air ahead of it past the check valve 65 to

the atmosphere. Upon subsequent retraction stroke, positive suction is drawn within the cylinder 49 until the O-ring 55 crosses onto the slots 48 and begins to open them. The suction draws the fluent material from the inlet chamber into the cylinder 49. Since a vacuum has been produced in the cylinder prior to the opening of the slots 48, the material is drawn quickly into the cylinder 49.

Upon subsequent forward movement of the piston 54, the material thus drawn into the cylinder 49 is expelled from it. After the O-ring 55 passes the slots 48, material cannot flow back into the bottle 21 or the inlet chamber, but is expelled past the check valve 65. On maximum stroke adjustment, the piston can move over until its forward end almost engages against the valve seat fitting 68. This permits it to expel practically all of any air or material in the chamber or cylinder 49. Consequently, when it starts its retraction or suction stroke, it produces a substantial vacuum in the cylinder and does not merely reduce the pressure of a considerable volume of air, as it would do if the pressure stroke did not reduce the volume of the cylinder to a minimum.

The stroke of the piston 54 can be changed by adjusting the screw 60. The operating mechanism has an infinite number of adjustments from one drop at each turn of the crank handle 62 to approximately 5 ml. at each turn of the crank handle. An exact measured quantity will be dispensed at each turn of the crank handle. By turning the crank, the screw 60 may be made accessible by a screw driver in the hole 78 in the bottom plate 73. The piston at maximum stroke moves back to enlarge the cylinder to its maximum extent. Even when the stroke is shortened, the piston still moves back so as to open the slots 48.

As the material is expelled past the valve 65, it is discharged through the passage 72 and the funnel-shaped opening 75 so as to be dispensed through the nipple 76. As the material in the bottle is used, the lever of the top thereof descends. The baffle 100 remains on the top surface of the material, when such is being dispensed. The principal function of the baffle 100 is to prevent the channelling of a passage through the middle of the material above the inlet to the cylinder 49. The suction produced by the piston is drawn over the whole mass of material in the bottle and cannot be concentrated readily through a single opening through to the top of the mass. When free-flowing lotions or liquids are dispensed, it is not necessary to use the baffle 100, because such products do not have any tendency to channel a passage through the middle of the material above the inlet to the cylinder 49.

It is also to be noted that the moving parts of the dispensing means are all in the base, and are not open at the top to the material in the container. The downward slope of the inverted top shoulder of the bottle 21 directs material toward the inlet opening. The very positive suction action of the piston draws it into the cylinder, and when pastes or gel-like materials are dispensed, the baffle prevents channelling through the mass. All of these elements cooperate to eliminate the need of stirrers and the like.

With the good seal at the neck of the bottle, it is unnecessary to keep a substantial depth of material in the dispenser base at all times. The bottle is preferably made of translucent material and the label panel 94 does not cover the entire bottle. As the material gets to the lower panel 93, its top level is visible to the user who will know when it is necessary to replace the bottle with one that is full.

The notches or ramps 98 are designed to register with indexing means on labelling machines so that the labels can be properly and accurately centered. The threading 84 is also arranged so that the bottle can have one point that always faces forward.

The various ribs and channels such as 92 and 95 on the body of the bottle as well as the ribs 89 on the top shoulder aid in preventing collapse of the bottle in the event the pressure inside becomes very low. The various stabi-

lizing supporting functions aid in preventing blows or the like, applied to the bottle, from breaking the seal.

The materials that can be readily dispensed with this dispenser include free-flowing liquids such as liquid soap, more viscous lotions, and still more viscous pastes or gel-like mixes such as gelled soaps, "waterless" hand cleaners, or the like.

When a tin can is used as the receptacle, the bridging ribs 33 are omitted. The can has its top cleanly removed. The base is inverted and placed over the open can (or if the material is relatively stiff and stable, the can may be inverted onto the base 20). In any case the can is seated firmly with the roller rim in the groove. The grooved walls preferably slope slightly outwardly so that the inner surface of the can fits snugly against them. The Allen screws, in appropriate number around the base, are then tightened down onto the rim. This holds the can firmly onto the base, and insures a seal so the piston can suck the material to be dispensed down into the cylinder. When the screws are all right, the base is reverted, which inverts the can onto the base. A vent hold should then be put into the upmost part of the inverted can. The surface 34 slopes down toward the opening in the inlet fitting 44, so that all material above this surface 34 moves into the inlet. The recesses in the surface shown in FIGURE 3 are for reducing the amount of plastic in the base, and do not contain much material. As shown in the other application, a baffle like 100 should be used in the can if gel or relatively stiff material is dispersed.

Various changes and modifications may be made within the process of this invention as will be readily apparent to those skilled in the art. Such changes and modifications are within the scope and teaching of this invention as defined by the claims appended hereto.

What is claimed is:

1. In a dispenser of the kind described for use with fluent material such as paste, gels, creams, lotions and liquids and the like, a base having a container-receiving upper portion; a container mounted on the base, the container having a tubular, circular and deformable neck through which fluent material may pass; the upper portion of the base having a circular recess to receive the neck, the recess having opposed, spaced, circular walls to receive the tubular neck between them, the walls being spaced apart substantially the thickness of the container neck, one wall and the neck having complementary threads, and the other being circular a back-up wall engaging the neck on the opposite surface to hold the threads in secure engagement and to resist over-twisting of the bottle into the recess; and dispensing means in the base to cause material to flow from the container into the base and be dispensed therefrom.

2. In the dispenser of claim 1: a narrow sealing ridge engageable between the end of the container neck and the bottom of the circular recess, the container and the base being drawn tightly onto said ridge when the container is threaded onto the base.

3. In the dispenser of claim 2, the ridge comprising a rounded top projection on and rising from the bottom of the recess in the base.

4. In the dispenser of claim 1, the backup wall being a taper toward its upper edge to make the entry of the neck easier, but the lower part of the backup wall being closer to the threaded wall to compress the neck between the walls.

5. In the dispenser of claim 1, the threaded wall being outside the backup wall, the neck having external threads, and the backup wall being engageable with the inside surface of the neck.

6. In the dispenser of claim 5, a vent passage in the base opening inwardly of the backup wall, and means to open and close the vent passage.

7. In the dispenser of claim 1, the upper portion of the base being generally concave and having a peripheral

rim; the container having a convex upper surface outwardly from the neck, that interfits on and is supported by the concave portion of the base, and the container having a peripheral ledge engageable on and supported by the rim of the base.

8. In the dispenser of claim 7, an enlargement in the circular recess in the base, adjacent the upper part thereof, providing a shoulder, and the container having a complementary shoulder formed in the neck, engageable therewith.

9. In a dispenser, a base, a receptacle for fluent material such as pastes, gels, creams, lotions and liquids and the like, mounted on top of the base; the base having an inlet opening into which material from the receptacle flows, a cylinder in the base extending at an angle to the inlet opening, inlet holes through the cylinder wall connecting to the inlet opening; a piston in the cylinder; an outlet leading from one end of the cylinder, the holes through the wall being spaced from that end; a valve in the outlet adjacent the end of the cylinder; a crank secured to the base beneath the cylinder and rotatable in a plane lengthwise of the cylinder, connecting means including a crank arm, the connecting means extending from the crank, lengthwise of the cylinder and connected with the end of the piston opposite to the outlet, whereby rotation of the crank can reciprocate the piston, the connecting means and piston being sized to at all times be contained substantially within the lateral limits of the base; the piston being reciprocable from closely adjacent the valved end of the cylinder at least to the inlet holes, whereby advance of the piston expels substantially all the material in the cylinder out past the valve, and retraction of the piston draws a vacuum in the cylinder until the piston opens an inlet hole, whereupon material is sucked into the cylinder by the vacuum; the inlet opening being centrally located in the base, the base having a wall surface extending upwardly and outwardly from the inlet opening, and the cylinder being below said wall surface.

10. The dispenser of claim 9, wherein the connecting means, the crank arm and piston are of light-weight plastic material, so as to reduce the unbalanced load of the moving parts, and hence to reduce vibration.

11. In the dispenser of claim 9, the base having a recess with vertical walls providing the inlet opening; a fitting in the recess having a grilled top; and the inlet holes in the bottom of the recess being elongated and narrow, and disposed lengthwise of the cylinder.

12. In a dispenser of the kind described: a base having a circular opening, with a threaded side wall and a bottom wall with an outstanding sealing ridge thereon; a plastic container having a threaded neck for being received into the opening; the container neck having a plastic end surface wider than and engaged onto the sealing ridge when the neck is threaded into the opening.

13. In the dispenser of claim 12, the circular opening having a circular backup wall spaced from the threaded wall to fit against the opposite side of the threaded neck of the bottle.

14. In a dispenser for fluent materials of the kind described: a dispenser base; a substantially horizontal cylinder in the base; an upper surface on the base shaped to receive and support a container of the fluent material; an inlet through the top surface leading into the cylinder; an outlet from the end of the cylinder at the end thereof; a piston reciprocable in the cylinder, a crank means below the cylinder including a crank handle, a crank arm and a connecting rod between the arm and the piston; the crank means parts and the piston being of plastic material, whereby the unbalanced load of the moving parts is minimized and vibration of the base upon operation of the crank is minimized, means to secure the dispenser to a wall, including a wall plate having a plurality of slots tapering toward their upper ends, to a smaller size, whereby they can engage over pins and the

weight of the dispenser forces the plate down into the pins with a wedging action.

15. In the dispenser of claim 14, the slots having large lower ends for engaging over headed pins, the slots being reduced at their upper ends as stated, to a size smaller than the pin heads.

16. In the dispenser of claim 14, the wall plate extending at least approximately as high as the upper surface of the base, and at least approximately as low as the lower part of the base; there being at least one of the slots adjacent the top edge of the plate and at least one of them adjacent the bottom edge; a product container extending upwardly from the upper surface of the base; the slots being tapered inwardly and upwardly, whereby when the base is applied over headed pins that pass through the slots, the weight of the dispenser and container of material presses the wall plate down to wedge the slots onto the shanks of the pins, and tends to urge the plate upwardly against the wall adjacent its bottom, and outwardly against the pin head at its top.

17. In the dispenser of claim 16, a dispensing mechanism in the base, including a cylinder in the base; a piston reciprocable in the cylinder; a crank on the base, and a connecting rod between the piston and the crank.

18. In the dispenser of claim 14, means to adjust the throw of the crank to provide adjustments of the piston stroke and hence of the amount dispensed per revolution of the crank.

19. In a dispenser: a base, a cylinder therein, the cylinder opening at one end to outside the base to permit a piston to be inserted; the cylinder having a reduction in size at the other end and a continuation beyond said reduction; an outlet in the base connecting to the cylinder at said other end; a ball check valve in the cylinder continuation, a valve seat device having a press fit into the reduction in the cylinder, the valve seat device being introduced into the cylinder through the open end.

20. In the dispenser of claim 19, a spring yieldably urging the ball check valve against the valve seat device, the latter being retained against the force of the spring by its press fit.

21. In the dispenser of claim 19, a piston in the cylinder, and manually operable means to reciprocate the piston, the manually operable means being mounted on the base and connected to the piston through the open end.

22. In the dispenser of claim 21, the manually operable means being a crank rotatably mounted on the base for rotation about a horizontal axis, so as to be operable by the hand of a user to one side of the base, and means connecting the crank and the piston.

23. The dispenser of claim 22, with means to adjust the stroke of the crank.

References Cited by the Examiner

UNITED STATES PATENTS

745,415	12/1903	Boekel	222—167
1,695,501	12/1928	Opitz	222—287
1,819,382	8/1931	Palmer	222—181
1,920,867	8/1933	Kirk	222—380 X
2,521,523	9/1950	Kemper	222—571
2,593,607	4/1952	Pruett	222—571
2,751,117	6/1956	Packwood	222—181 X
2,760,688	8/1956	Packwood	222—181
2,765,964	10/1956	Hanlon	222—383 X
2,899,110	8/1959	Parker	150—.5
3,006,396	10/1961	Cushman	150—.5
3,024,946	3/1962	Forsyth	222—309 X
3,061,149	10/1962	Bystrom	222—167
3,072,297	1/1963	Lippman et al.	222—181

RAPHAEL M. LUPO, *Primary Examiner.*

CHARLES R. CARTER, *Examiner.*