Dec. 27, 1949 E. F. OLSEN 2,492,533

DISPENSING DEVICE FOR COLLAPSIBLE TUBES

Filed Aug. 12, 1948 3 Sheets-Sheet 1

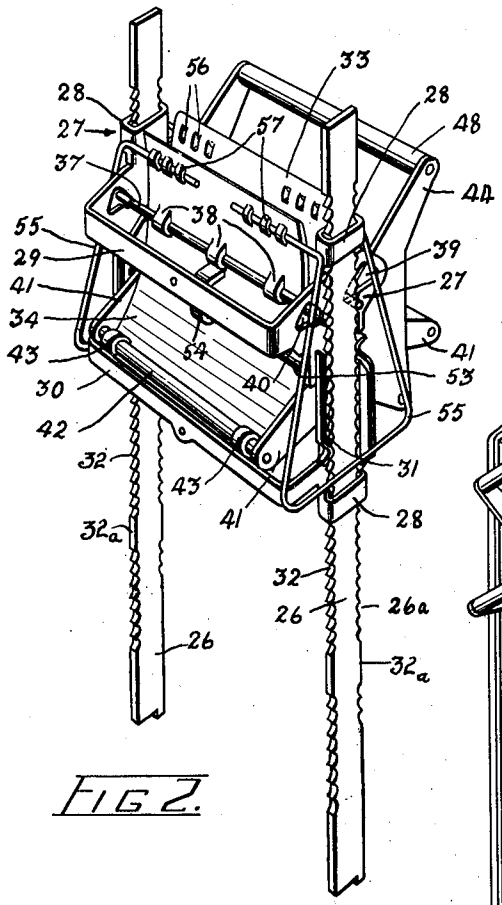


FIG 2.

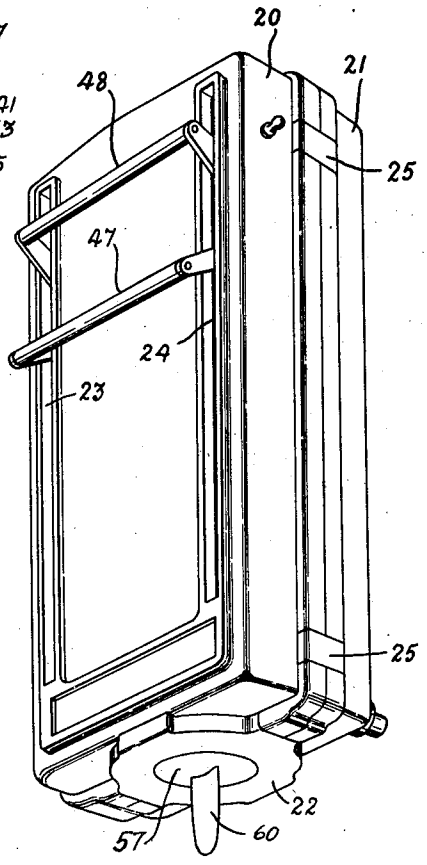


FIG 1.

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DISPENSING DEVICE FOR COLLAPSIBLE TUBES

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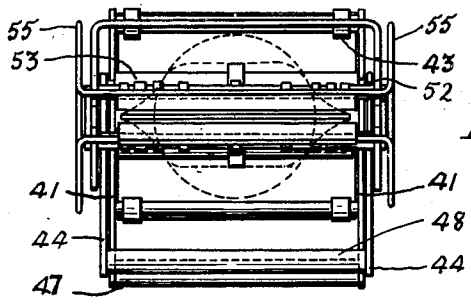


FIG 4.

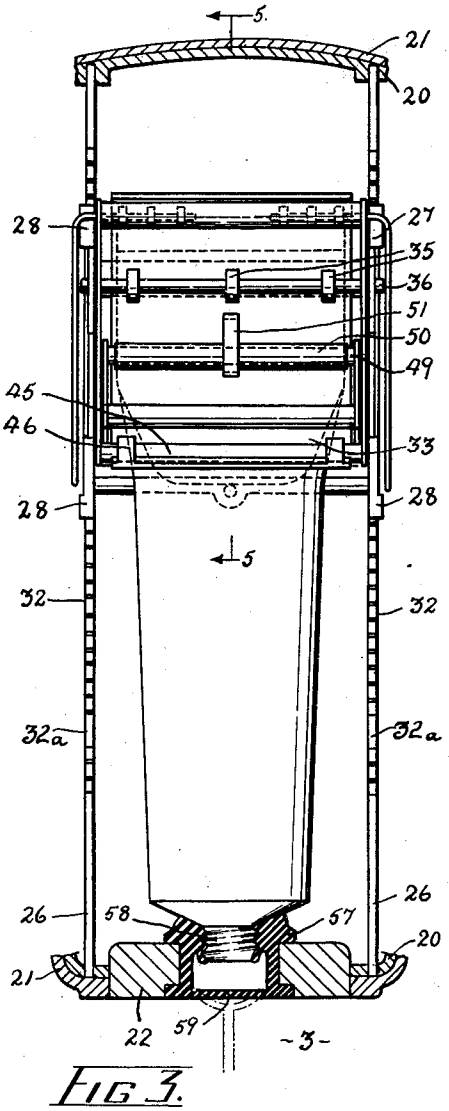
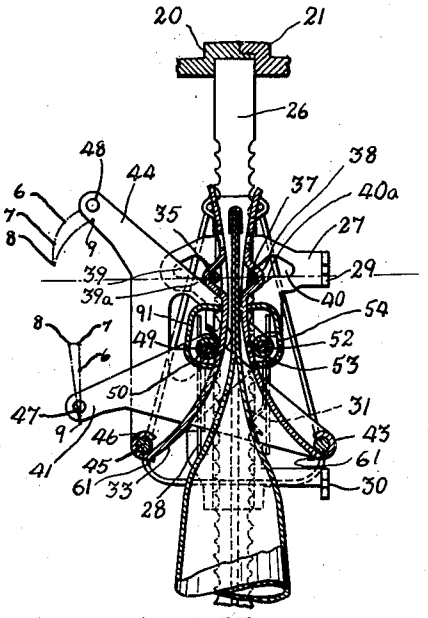


FIG 3.

FIG 5.



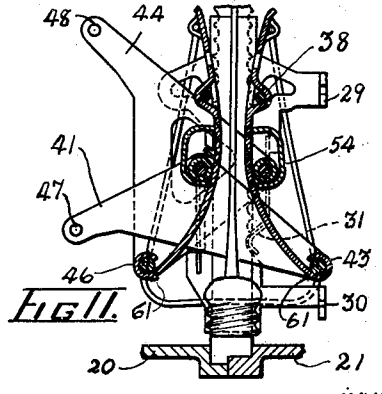


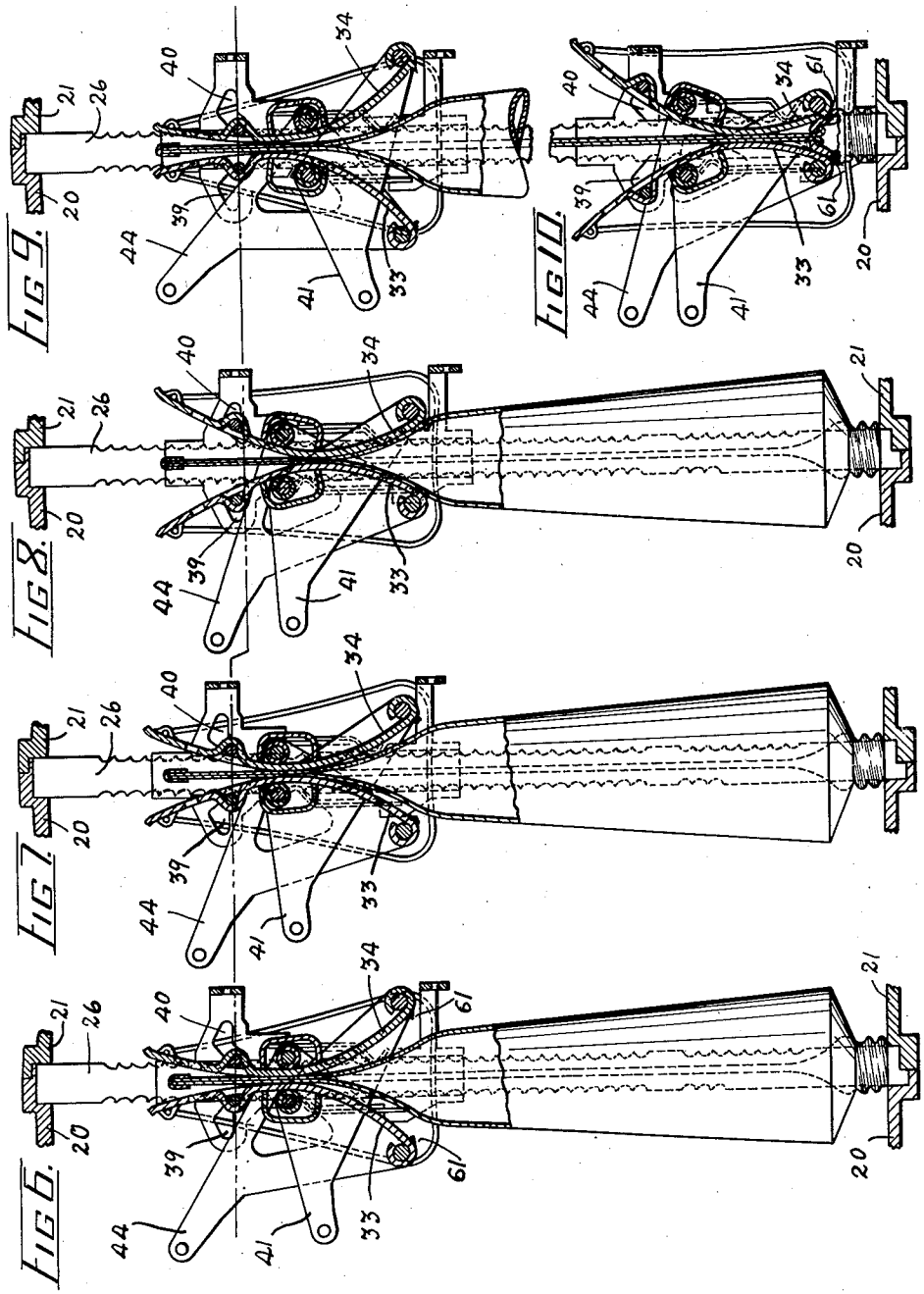
FIG 11.

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DISPENSING DEVICE FOR COLLAPSIBLE TUBES

Filed Aug. 12, 1948 3 Sheets-Sheet 3



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Patented Dec. 27, 1949 2,492,533

UNITED STATES PATENT OFFICE

2,492,533

DISPENSING DEVICE FOR COLLAPSIBLE TUBES

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Application August 12, 1948, Serial No. 43,867

13 Claims. (Cl. 222—103)

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This invention relates to dispensing devices for collapsible tubes of the type generally used for containing liquids or pastes such as toothpaste, shaving cream and the like.

It is an object of the invention to provide a dispensing device of this character which is sanitary, dependable, simple to operate, inexpensive to manufacture, of compact construction, of pleasing appearance, and economical to use.

It is another object of the invention to provide a dispensing device so constructed and arranged that the operation of its mechanical components is independent of gravity, the device being therefore adapted to be used in any position.

It is a further object of the invention to provide a dispensing device having pressure plates arranged to receive a tube therebetween, and which will fully collapse the tube by gradual increments, means being provided in the device to index downwardly the pressure plates as the tube gradually flattens.

It is a further object of the invention to provide in a device of this character a mechanical action whereby the pressure plates will automatically open to allow the empty tube to be removed from the device after its contents have been thoroughly ejected.

It is a further object of the invention to provide in a dispensing device of this character a discharge valve which will conveniently fit over the neck of tubes of any of the conventional designs and sizes.

It is a further object of the invention to provide a discharge valve which will normally remain closed and which will open only when the user applies sufficient pressure to the tube, by means of the mechanical components of the device, the said valve closing as soon as the pressure is released.

It is still another object of the invention to provide in a dispensing device of this character a casing which houses and supports the mechanism and which is also constructed for easy loading and reloading.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in conjunction with the accompanying drawings, wherein like characters of reference indicate corresponding parts throughout the several views and wherein:

Fig. 1 is a perspective view illustrating particularly the outside appearance of a dispensing device constructed in accordance with this invention.

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Fig. 2 is a perspective view, viewed from the rear, of the main mechanical components of the device shown in Fig. 1, the casing being removed.

Fig. 3 is a front elevation of the apparatus shown in Fig. 2, showing also a collapsible tube and a valve mounted therewith.

Fig. 4 is a top plan view of the apparatus shown in Fig. 2, the casing being removed.

Fig. 5 is a sectional view taken through the line 5—5 of Fig. 3.

Figs. 6, 7, 8 and 9 are views similar to Fig. 5 showing the parts of the squeezing mechanism in various positions.

Fig. 10 is a view similar to Fig. 5 of the squeezing mechanism in its lowermost position when the finger bars are brought together as closely as possible; and

Fig. 11 is a view similar to Fig. 10, of the squeezing mechanism in its lowermost position when the finger bars are finally released.

For a better understanding of the invention, it should be mentioned at this stage that exactly the same apparatus is shown in Figs. 5 through 11, the sole difference in these figures being merely a change in the relative position of the parts. A horizontal reference line is drawn through each of Figs. 5 through 9, there being a point of discontinuity in the said horizontal line to indicate the advance of the squeezing mechanism. In Fig. 5 are indicated the paths followed by the finger bars as they are squeezed by the operator, the reference characters 6, 7, 8 and 9 in the said Fig. 5 indicating the positions of the finger bars when the various components of the squeezing mechanism are in the position shown in Figs. 6, 7, 8 and 9 respectively.

Referring particularly to Figs. 1 through 5, the dispensing device comprises a hollow casing made of two die-cast or molded half-shells 20 and 21, the bottom walls of the said half-shells being provided with cutaway portions so that when the half-shells are in assembled relationship, there is an opening in the said bottom wall in which may be inserted a valve retaiining cover 22. In the front half-shell are provided vertically disposed slots 23 and 24 through which extend the operating levers of the squeezing mechanism. The two half-shells are secured in assembled relationship by suitable spring clips 25, the two lower spring clips also providing tension which when transmitted through the casing halves 20 and 21 retains the cover 22 in its opening.

Removably mounted inside the casing are indexing bars 26 having notches 32. The upper and lower ends of the indexing bars fit into re-

cesses provided in the top and bottom walls respectively of the half-shell 22, and they are securely held therein when rear half-shell 21 is securely mated with the front half-shell 20.

Reciprocably mounted on the indexing bars are carriages 27, 27, the said carriages being provided with guides 28, and the carriages being secured to each other for greater rigidity by bars 29 and 30. Adjacent the edges of each carriage are indexing springs 31 the bent tips of which are adapted to engage any one of the notches 32 provided in the indexing bars. Mounted in a manner hereinafter described, between the carriages, is a front pressure plate 33 and a rear pressure plate 34, the said pressure plates having oppositely facing plano-convex surfaces, which are serrated or otherwise treated so that they will engage the tube inserted therebetween with a high degree of friction or traction. Secured to pressure plate 33 by means of knock-outs 35, is an indexing rod 36, and a similar indexing rod 37 is secured to pressure plate 34 by means of knock-outs 38. The extremities of the indexing rods 36 and 37 engage in cam-shaped apertures 39 and 40 provided at the front and rear respectively of each of the carriages 27, 27. The point of discontinuity or notch 39a and 40a in the lower edges of the cam-shaped apertures 39 and 40 should be particularly noted.

Generally triangular-shaped operating levers 41 are disposed transverse to the surface of the pressure plates and are secured to each other at one apex by a rod 42 which is journalled in knock-outs 43 provided in pressure plate 34 adjacent the lower edge thereof. Another pair of somewhat similar triangular-shaped operating levers 44 are similarly secured to each other at one apex by a rod 45 which in turn is journalled in knock-outs 46 provided in pressure plate 33 adjacent the lower edge thereof. The triangular-shaped operating levers are effectively bell-crank levers, one apex of each one of the pairs of triangular-shaped operating levers 41 and 44 being journalled as previously mentioned adjacent the lower edge of the respective pressure plates, and a second apex of each one of the pairs of operating levers being joined by finger bars 47 and 48 respectively. The third apexes of operating levers 41 are joined by a bearing rod which comprises rod 49 around which is rotatably mounted a roller 50 adapted to roll against the rear face of pressure plate 33, the movement of the said roller being limited by knock-out 51 provided in the said pressure plate which provides a stop. The third apexes of operating levers 44 are similarly joined by bearing rods comprising rod 52 around which is rotatably mounted a roller 53 which is adapted to roll against the rear face of pressure plate 34, the movement of the said roller being limited by knock-out 54 in the said pressure plate which provides a stop.

As will be observed from the drawings and from the foregoing description, the mounting of the operating levers to the pressure plates effectively provides a scissor action, the fulcrum of the scissors, namely the rollers 50 and 53, being movable.

The pressure plates normally tend to close against one another due to the provision of pairs of U-shaped springs 55, the ends of which are respectively secured to pressure plates 33 and 34 by means of knock-outs 56 and 57.

In a circular opening provided in the valve retaining cover 22 is inserted a hollow discharge valve 57 which is made of rubber or similar resilient material. This discharge valve has an annular groove in its side walls to retain it in the cover 22 and is provided with a circular opening at one end which is expandable to receive the usual neck 58 of a toothpaste tube or the like as shown in Fig. 3, the other end of the valve being provided with a narrow slit 59. When sufficient pressure is applied to the tube 58, thereby forcing out the contents, the said contents will be ejected through the slit as shown at 60 in Fig. 1, but as soon as the pressure on the tube is removed the slits will automatically close due to the natural resiliency of the rubber, thereby cutting off the ribbon of paste being ejected.

Having described the mechanical components of the device, its operation will now be described in detail with particular reference to Figs. 5 through 11 in numerical sequence.

In Fig. 5 the squeezing mechanism is shown in its normal position at rest, or in other words in the position which it assumes at all times when the finger bars 47 and 48 are not subjected to any pressure. The mechanism is held in this position due to the tension provided by U-shaped springs 55 acting on the upper ends of the pressure plates 33 and 34 causing the said upper ends to tend to close towards each other, this closing tendency being limited by the upper ends of the springs coming to rest against the top ends of the carriages 27, 27.

It should be noted that when the mechanism is at rest, the tips of the indexing rods 36 and 37 are each resting in one of the notches 32 of the indexing bars 26. Moreover there is a fulcruming action of the pressure plates about these indexing bars. Since the upper ends of the pressure plates have a tendency to close towards each other, the lower ends will have a tendency to spread apart due to the aforementioned fulcruming action, this spreading apart action being limited by the tubular rollers 50 and 53 journalled on the rods 49 and 52 respectively, which tubular rollers are limited in their travel by the knock-outs 51 and 54 provided in the pressure plates 33 and 34 on which the said rollers travel. It should also be noted that each one of the four indexing springs 31 are in this position in engagement with one of the notches 32 in the indexing bars 26.

The engagement of the springs 31 with the notches of the indexing bar and the engagement of the ends of the indexing rods 36 and 37 with other notches of the indexing bars holds the squeezing mechanism firmly in its normal at rest position. The mechanism being securely held by the several indexing springs 31, the carriages 27, 27 cannot move by gravity or by shock and therefore there is no danger of there being an untimely discharge of the contents of the tube. Moreover since the pressure plates are spread slightly apart when they are in the normal at rest position, the tube of tooth paste or the like may be removed from the dispenser if it should be so desired, whether the said tube is fully discharged or not; moreover since the tube is free between the pressure plates there is no danger of the contents of the tube untimely discharging.

When the finger bars 47 and 48 are moved towards each other by the pressure of the user's finger so as to discharge the contents of the tube, the finger bars of the mechanism will gradually reach the position shown in Fig. 6. During the movement of operating levers 41 and 44 from their position in Fig. 5 to their position in Fig. 6, the pressure plates 33 and 34 are subjected to pressure by rollers 50 and 53, causing the lower part of the plates to gradually close against the

tube in a swinging motion. This swinging motion of the pressure plates takes place about the indexing rods 36 and 37 as fulcrums, and the motion is resisted by the tension of the springs 55 acting on the upper ends of the pressure plates. The scissor action of the operating levers 41 and 44 causes the rollers 51 and 53 to bear against the pressure plates, the said rollers gradually moving upwardly on the curved back surfaces of the pressure plates. When finally the mechanism assumes the position shown in Fig. 6, the tube is subjected to a definite squeezing action between the pressure plates. It should be noted that in this position, the indexing rods 36 and 37 still engage the same notches 32 of the indexing bars 26 which they were engaging in the position shown in Fig. 5, and moreover the indexing springs are still in engagement with their respective notches.

Under a continued finger pressure by the operator on the finger bars 47 and 48, the parts of the squeezing mechanism will gradually move from the position shown in Fig. 6 to that shown in Fig. 7, the relative operation of the parts being as hereinafter described.

Since the pressure plates are now in contact with the tube, the tube causes greater resistance to the closing of the jaws than do the U-shaped springs 55, and thus the pressure plates will no longer fulcrum about the indexing rods 36 and 37 but will fulcrum about their constantly changing line of contact about the tube. Thus the pressure plates start a rolling motion causing their line of contact with the tube to move a slight distance towards the discharge end of the tube, thereby flattening out the tube by a distance equal to the distance the said line of contact has moved. Simultaneously with this action of the pressure plates 33 and 34 and as a result of the continued pressure by the operator on the finger bars 47 and 48, the indexing rods 36 and 37 will swing out of engagement with the particular notches 32 in the index bars 26 and they will bear against the lower edges of cam-shaped apertures 39 and 40 which are provided in each of the carriages 27, 27.

During the motion of the squeezing mechanism from the position shown in Fig. 6 to that shown in Fig. 7, it should be noted that the rollers 50 and 53 travel further up along the back faces of the respective pressure plates while they of course continue to press against the pressure plates as a result of the pressure of the operator's fingers on the finger bars 47 and 48. Thus the resulting force of the operator's finger pressure causes the finger bars to close more towards each other, and with the said rollers acting as fulcrums the lower ends of the pressure plates which are connected to the operating levers 41 and 44 by means of rods 43 and 45 will be brought closer to each other. However, it is not the lower extremities of the pressure plates which bear against the tube of paste, but it is a higher part of the pressure plates which have this bearing action; thus a good leverage action is provided.

When the mechanism gradually moves from the position shown in Fig. 7 to that shown in Fig. 8, the indexing rods bearing against the lower edges of the cam-shaped apertures will strike the points of discontinuity or notches 39a and 40a in the said edges, and since the pressure plates are frictionally gripping the tube whereas the carriages are merely prevented from moving due to the engagement of the indexing springs 31 in some of the notches 32 of the indexing bars 26, the tension of the indexing springs will be overcome and the indexing rods striking the notches in the cam-shaped apertures will cause the said carriages to move downwardly. Each of the four springs 31 will thus come to rest in engagement with the next lower notches 32 in the indexing bars 26.

Throughout the aforedescribed operations, the squeezing action of the pressure plates has been compressing the tube and therefore its contents were being ejected in a narrow ribbon through the slit 59, as shown at 60 in Fig. 1.

Assuming that after the operator has squeezed the finger bars to the extent shown in Fig. 8 he releases the said finger bars, the pressure on the tube is immediately released and therefore the discharge of paste is interrupted. Under the influence of the springs 55, the pressure plates 33 and 34 and all the other parts of the mechanism are returned to their original position with respect to the carriages 27, 27 with the exception that the indexing rods 36 and 37 will now be engaging notches 32 one step lower than the notches that they were engaging prior to the operator having ejected some paste from the tube. The mechanism will therefore now be in the position shown in Fig. 9. In this figure, the mechanism is one step lower than it was as shown in Figs. 5–7, but the parts of the mechanism are in exactly the same relationship towards each other as they were in the position shown in Fig. 5.

The subsequent operations of the mechanism are identical to the aforedescribed operations, each substantial squeezing of the finger bars by the operator causing the mechanism to move downwardly by one notch. However should the operator not squeeze the finger bars to an extent sufficient to make the mechanism assume the position shown in Fig. 8, or in other words should he interrupt the squeezing operation, the squeezing mechanism will return to the position which it originally assumed prior to the interrupted squeezing operation. Assuming therefore that the operator releases the finger bars 47 and 48 when the squeezing mechanism has reached the position shown in Fig. 7, the indexing rods 36 and 37 will not have reached a position where they will cause the carriages 27, 27 to move downwardly. Therefore as soon as the operator's finger pressure is released from the finger bars the indexing rods will relocate themselves in their previous position. It should be noted that during the period of time however short after which the operator has released the finger bars and the mechanism is returning to the positions of rest shown in Fig. 5 or Fig. 9, the indexing springs 31 are the controlling factors which hold the mechainsm in a definite position.

It should at this point be explained that one particular feature of the construction of the device disclosed and claimed herein is that with each squeezing operation the pressure plates automatically retrace part of the previously flattened tube. This feature is the result of the initial fulcruming of the pressure plates 33 and 34 about the indexing rods 36 and 37. Therefore at the initiation of a squeezing operation the pressure plates will contact the tube at a location slightly short of the extent to which the tube was flattened in the previous squeezing operation. This feature insures a complete ironing out of the tube and therefore a thorough ejection of its contents.

Normally the finger bars 47 and 48 are not pressed to an extent greater than that shown in

Fig. 8. However should the user so desire he may press them to the extent shown in Fig. 10, causing the indexing rods 36 and 37 to reach the extreme position of the cam-shaped apertures 39 and 40. If the finger bars are squeezed to that extent, a large quantity of tube content will be discharged in one squeeze, but this amount will be greatly in excess of that normally required by the user. Thus this extreme squeezing action is therefore rarely if ever needed during the normal progressive dispensing of the contents of the tube. However this maximum squeezing action insures the user being able to eject from the tube its complete contents when it is squeezed the last time. During this last operation lips 61 provided at the lower edges of the pressure plates will grip the tube against its neck and therefore any tendency that the pressure plates might have to slip back will be minimized.

When after the final squeezing operation to collapse the tube to the fullest extent practicable, the operator releases the finger bars 47 and 48 the mechanism will assume the position shown in Fig. 11, and it will be noted that the pressure plates are spread open to an extent greater than normal. This is due to the fact that the indexing rods 36 and 37 come to rest at 32^a against the indexing bar 26; it will be noted that at 32^a the indexing bars have no notches, and therefore the pressure plates cannot close to their normal position. This feature enables the empty tube to be more easily removed from the dispenser. Moreover when a new tube is inserted in the dispenser its upper end will engage the pressure plates and if the tube is pushed further the carriages 27, 27 will be pushed back into the dispenser by the end of the tube and the mechanism will be located at the correct position for use.

It is thought that the construction and use of the invention will be apparent from the above description of the various parts and their purpose. It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

What I claim as my invention is:

1. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, and the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween.

2. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, a pair of triangular-shaped levers, one at each side of the pressure plates, each lever having one apex pivotally connected to the lower end of one of the pressure plates, another apex connected by a finger bar to the corresponding apex of the other lever, and a third apex connected by a bearing rod to the corresponding apex of the other lever, the said bearing rod engaging the back of the other pressure plate; another pair of triangular levers, one at each side of the pressure plates, each lever having one apex pivotally connected to the lower end of the said other pressure plate, another apex connected by a finger bar to the corresponding apex of the other lever of the pair, and a third angle connected by a bearing rod to the corresponding angle of the other lever, said bearing rod engaging the back of the pressure plate to the lower end of which the first mentioned pair of pressure plates is connected; the bearing rod of each pair of levers providing a fulcrum about which the levers pivot when the two finger bars are pressed towards each other thereby bringing the lower edges of the pressure plates closer to each other to collapse the tube therebetween.

3. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of each of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, and the remaining apex of each of the levers of each pair being connected by a bearing rod which is adapted to engage and fulcrum against the back of the pressure plate to the lower end of which the levers of the other pair are connected, so that when the two finger bars are pressed towards each other the pressure plates will roll on each other as their lower ends close towards each other.

4. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair being connected by a bearing which is adapted to engage and fulcrum against the back of the pressure plate to the lower end of which the levers of the other pair are connected, so that when the two finger bars are pressed towards each other the pressure plates will roll on each other as their lower ends close towards each other, and a stop on the back of each pressure plate adapted to engage the lower edge of the bearing rod so as to limit the extent to which the lower ends of the pressure plates can spread apart.

5. A dispensing device for collapsible tubes comprising a pair of curved pressure plates dis-

posed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, and a spring connecting the two pressure plates at a point above the region where the bearing rods fulcrum against the pressure plates, the said spring being adapted to normally urge the upper ends and therefore the lower ends apart.

6. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, fingers bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, an indexing rod secured to each pressure plate and extending transversely thereof beyond at least one side thereof, a carriage at each side of the pressure plates having therein two spaced apart apertures in which the ends of the indexing rods are loosely mounted and by which the pressure plates are connected to the carriage, indexing bars on which each carriage is adapted to travel, and a casing to which the indexing bars are secured.

7. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, an indexing rod secured to each

pressure plate and extending transversely thereof beyond at least one side thereof, a carriage at each side of the pressure plates having therein two spaced apart apertures in which the ends of the indexing rods are loosely mounted and by which the pressure plates are connected to the carriages, notched indexing bars on which each carriage is adapted to travel, and indexing springs secured to the carriages and adapted to engage the notches of the indexing bars thereby frictionally retaining the carriage in its various indexed positions.

8. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, an indexing rod secured to each pressure plate and extending transversely thereof beyond at least one side thereof, a casing, indexing bars secured to the casing, and a carriage at each side of the pressure plates adapted to travel on one of the indexing bars, each carriage having therein two spaced apart apertures in which the ends of the indexing rods are loosely mounted and by which the pressure plates are connected to the carriage, the indexing bars having on their operative edges an elevated portion with which the indexing rods engage when the pressure plates are at their lowermost position in the casing, the said elevated portions limiting the extent to which the indexing rods of each pressure plate may approach each other and thus preventing the pressure plates from closing against each other beyond a predetermined limit when they are at their lowermost position in the casing.

9. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apex of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, an indexing rod secured to each pressure plate and extending transversely thereto beyond at least one side thereof, a casing, notched indexing bars secured to the casing, and a car-

riage at each side of the pressure plates adapted to travel on one of the indexing bars, each carriage having therein two spaced apart apertures in which the ends of the indexing rods are loosely mounted and by which the pressure plates are connected to the carriage, the said apertures having a cam-faced edge against which the indexing rod mounted therein is adapted to bear when the lower ends of the pressure plates are closed against one another by squeezing the finger bars thereby moving the indexing rods away from each other, the rods as they move away from each other forcing the carriages downwardly due to their engagement with the cam-faced edges.

10. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, an indexing rod secured to each pressure plate and extending transversely thereto beyond at least one side thereof, a casing, notched indexing bars secured to the casing, a carriage at each side of the pressure plates adapted to travel on one of the indexing bars, and indexing springs secured to the carriages and adapted to engage the notches of the indexing bar thereby frictionally retaining the carriage in its various indexed positions, each carriage having therein two spaced apart apertures in which the ends of the indexing rods are loosely mounted and by which the pressure plates are connected to the carriage, the said apertures having a cam-faced edge against which the indexing rod mounted therein is adapted to bear when the lower ends of the pressure plates are closed against each other by squeezing the finger bars thereby moving the indexing rods away from each other, the rods as they move away from each other overcoming the frictional engagement of the indexing springs with the indexing rods and forcing the carriages downwardly due to their engagement with the cam-faced edges, the indexing springs thus engaging notches below the notches which they were engaging prior to the downward movement of the carriages, and holding the carriages in the moved position even after the finger bars are released.

11. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other to collapse the tube therebetween, an indexing rod secured to each pressure plate above the region thereof against which the remaining apex of the levers of each pair fulcrums, the said indexing rods extending transversely of the pressure plates beyond at least one side thereof, and a carriage at each side of the pressure plates having therein two spaced apart apertures extending outwardly relative to the center line between the pressure plates and in which the ends of the indexing rods are loosely mounted and by which the pressure plates are connected to the carriage, the indexing rods normally bearing against the inner edges of the apertures, the said inner edges providing fulcrum points on which the pressure plates initially fulcrum when the finger bars are squeezed by the operator until the said pressure plates grip the tube, at which stage the pressure plates fulcrum about the aforesaid remaining apexes of the levers and the indexing rods move outwardly in the said apertures.

12. A dispensing device for collapsible tubes comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the coresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each other, to collapse the tube therebetween, a casing, means for mounting the pressure plates and the levers cooperating therewith for movement relative to the casing, and means mounted on the casing for holding the tube therein by its dispensing end.

13. A dispensing device for collapsible tubes of the type having a firm shoulder at their dispensing end comprising a pair of curved pressure plates disposed face to face and arranged to receive a collapsible tube therebetween, two pairs of triangular levers, one lever of each pair being at opposite sides of the plates, finger bars connecting one of the apexes of each of the two levers at one side of the pressure plates to the corresponding apexes of the two levers at the other side of the pressure plates, another apex of one pair of levers being pivotally connected to the lower end of one of the pressure plates, another apex of the other pair of levers being pivotally connected to the lower end of the other pressure plate, the remaining apex of the levers of each pair fulcruming against the pressure plate to the lower end of which the levers of the other pair are connected, so that when the finger bars are pressed towards each other the lower ends of the pressure plates close towards each

other to collapse the tube therebetween, the pressure plates having on their inner face at their lower edge a ridge adapted to grip the shoulder of the tube to prevent the plates from slipping on the tube and sliding back when the plates attempt to collapse the tube around the region of the firm shoulder.

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