June 4, 1935. W. H. SCOTT 2,004,015

DISPENSING DEVICE

Filed May 21, 1934

Fig. 1.

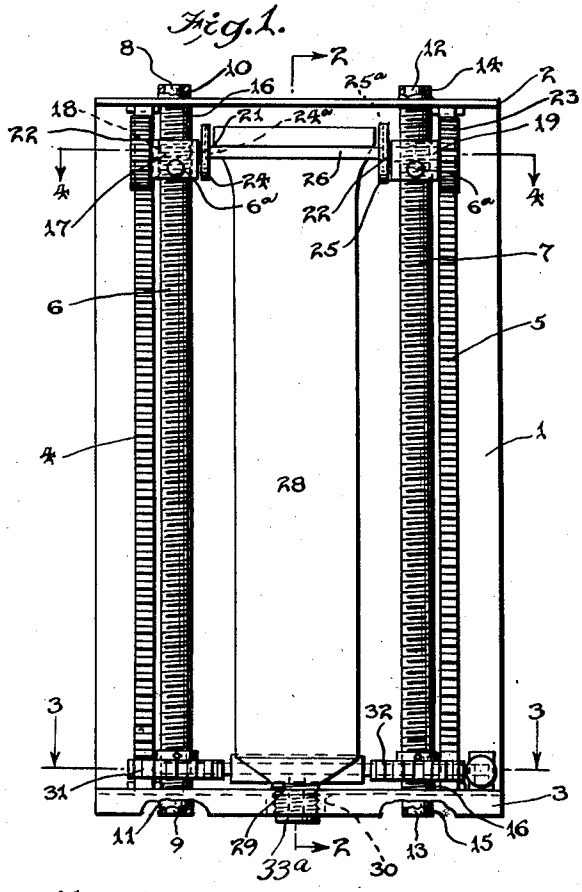


Fig. 2.

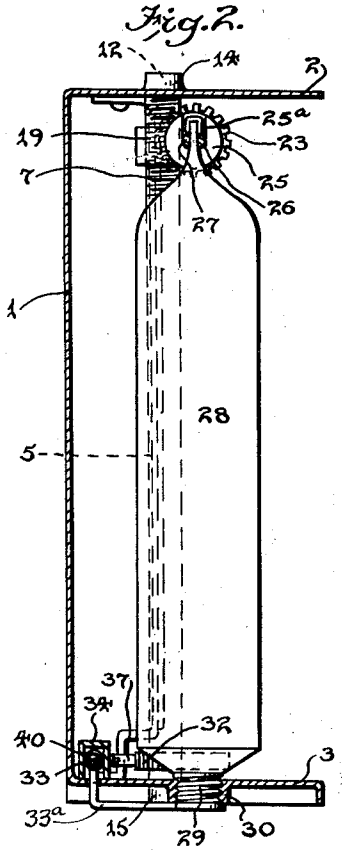


Fig. 3.

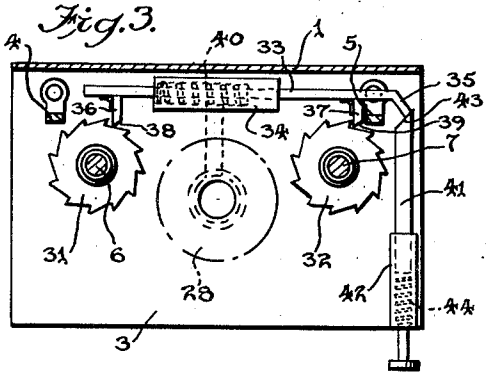


Fig. 4.

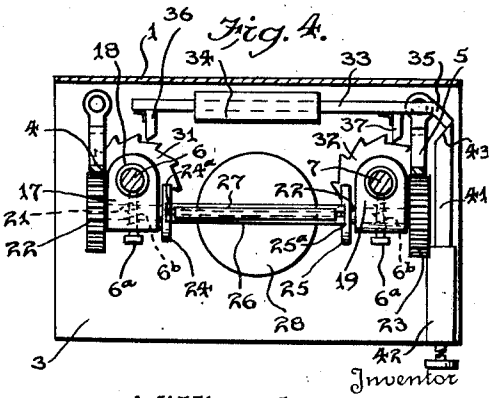
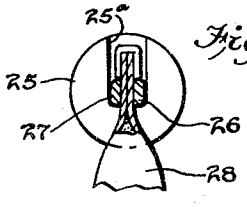


Fig. 5.



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Patented June 4, 1935

2,004,015

UNITED STATES PATENT OFFICE

2,004,015

DISPENSING DEVICE

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Application May 21, 1934, Serial No. 726,852

12 Claims. (Cl. 221—60)

This invention relates to a dispensing device.

One object of the invention is to provide a dispensing device embodying a support for the common collapsible or compressible tubes in a manner that a tube can be squeezed, folded or compressed gradually from one end to the other to effect a uniform dispensing of the paste, creams, soaps, et cetera.

Another object of the invention is to provide a simple, inexpensive, durable and efficient device of the nature stated, embodying among other characteristics, means whereby to effect a discharge of a predetermined uniform amount of the contents of the container or tube on each operation thereof.

A still further object of the invention is to provide a device adapted to be mounted in a convenient place for the support of a common type of collapsible or compressible tube and to operate upon the same to dispense material uniformly in such a manner as to avoid unnecessary waste of the material.

With these and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter described, illustrated in the accompanying drawing, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawing:

Figure 1 is a front elevation.

Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 1, the dotted lines indicating operative positions of the actuating means.

Fig. 5 is an enlarged detail sectional view illustrating the manner of mounting the spaced tube engaging elements on the heads of the transversely aligned shafts.

Referring now more particularly to the accompanying drawing, there is illustrated a holder or bracket including an oblong or other shaped body portion 1 provided with upper and lower end wall members 2 and 3 respectively, and which are directed outwardly at substantially a right angle to the body portion 1, as shown. This holder or bracket may be composed of sheet metal or any other suitable material and the body portion may be fastened to a wall or other suitable support in any suitable manner.

The body portion 1 is provided at opposite sides with spaced longitudinal racks 4 and 5 consisting of corrugated strips secured at their ends to the body portion 1 at the top and bottom thereof. These spaced racks 4 and 5 may be otherwise formed and applied to the body portion.

Feed screws 6 and 7 are journaled at their ends in the aforesaid end members 2 and 3. These threaded members 6 and 7 may be in the form of screws, as shown, or they may be otherwise formed as for instance in the nature of worms. In any event, the ends of the threaded member 6 are reduced to provide upper and lower bearings 8 and 9 which are journaled to rotate freely in the bearings 10 and 11 of the respective end members 2 and 3. The threaded member 7 has its ends reduced to provide the upper and lower bearings 12 and 13 which are freely rotatably journaled in the bearings 14 and 15 of the respective end members 2 and 3. Shoulders 16 result from the formation of the reduced ends of the threaded elements 6 and 7, and which engage the inner faces of the end members 2 and 3 to prevent longitudinal displacement of the threaded elements 6 and 7. The threaded elements 6 and 7 are arranged within the aforesaid racks 4 and 5 and adjacent thereto.

Bearing block 17 provided with an opening 18 is mounted on the feed screw or threaded element 6 for movement along the latter. A similarly formed bearing block 19 has threaded movement with and along the screw or threaded element 7. These blocks 17 and 19, which are adapted to move in unison along the feed screws or threaded elements 6 and 7 and maintain oppositely disposed relation, are provided with spring actuated pins 6^a for engaging the relatively coarse threads with which the feed screws or threaded elements 6 and 7 are provided. The springs 6^b urge the pins 6^a inwardly and normally maintain the same in engagement with the threads of the feed screws. When the bearing blocks reach the limit of their feeding movement the pins are adapted to be withdrawn from engagement with the screw threads for enabling the bearing blocks 17 and 19 to slide over the threads and be returned to their initial or starting position. The bearing blocks may, however, be provided with any other suitable thread engaging means, such as thread openings.

Transversely aligned shafts 20 and 21 are journaled in the respective bearing blocks 17 and 19. These shafts 20 and 21 carry gears 22 and 23 at

their outer ends for constant mesh with the respective racks 4 and 5. The inner end of each shaft 20 and 21 is provided with a head 24 and 25, respectively, and the shafts 20 and 21 are connected in their horizontal alignment by two spaced elements 26 and 27 which are adapted to engage opposite sides of the closed end of the compressible or collapsible tube 28. The ends of the tube engaging elements 26 and 27 are detachably arranged in grooves 24a and 25a in the heads 24 and 25 of the transversely aligned shafts and after the closed end of the tube 28 is engaged by the said elements and the transversely aligned shafts have been given a rotation, the elements 26 and 27 will be retained in such engagement with the tube and in the grooves 24a and 25a of the heads 24 and 25. When the tube 28 is entirely collapsed the elements 26 and 27 may be readily removed from the grooves 24a and 25a of the heads 24 and 25 and may then be withdrawn from the roll portion of the collapsible tube. The tube 28 has a nozzle 29 which is exteriorly screw-threaded and when the usual cap (not shown) of the tube 28 is removed, the screw-threaded nozzle 29 may be screwed into the screw-threaded orifice 30 in the bracket end member 3, so as to effect discharge of material from the container or tube 28 in a manner which will be hereinafter described.

Ratchet wheels 31 and 32 are keyed or otherwise fixedly secured to the lower ends of the feed elements 6 and 7, and they are disposed relatively close to the end member 3 of the bracket.

A transversely slidable actuating bar 33 is mounted in a suitable guiding means 34 on the end member 3 and this bar 33 has a laterally directed end portion 35 and two spaced pivotally mounted spring pressed detents 36 and 37, each of which latter has a bevelled free end 38 and 39, respectively, as shown. The bar 33 is normally restrained by means of a spring or other suitable element 40 secured thereto and to the end member 3 of the bracket. Any form of spring or other means for this purpose may be employed.

The detents 36 and 37 carried by the bar 33 are arranged to engage the respective ratchet wheels 31 and 32 to impart a step by step movement to the feed screws or threaded elements 6 and 7 to partially rotate the same simultaneously. To actuate the actuating bar 33 there may be provided a push rod 41 slidably mounted in any suitable guiding means, such as that indicated at 42. This push rod 41 is provided with a tapered or wedge-shaped inner end portion 43 adapted to engage the deflected or laterally directed end 35 of the bar 33 to actuate the latter against the action of said spring 40. The push rod 41 is normally retracted by means of a spring 44 but any other suitable means for this purpose may be employed.

To dispense material from the collapsible or compressible container or tube 28, it is simply necessary for the operator to push in upon the push rod 41. This will force the tapered or wedged end 43 of the push rod 41 to engage with the deflected or laterally directed part 35 of the bar 33 and cause the ends of the detents 36 and 37 to engage the teeth of the ratchet wheels 31 and 32 and partially rotate the latter. These ratchet wheels 31 and 32 being fixed to the feed screws 6 and 7, the latter are caused to rotate in unison. The blocks 17 and 19 are consequently fed downwardly along the feed screws 6 and 7.

The bar 33 is provided with a finger 33a forming a closure for the nozzle 29 of the collapsible tube 28. The movement of the bar 33 by the push rod, is adapted to uncover and cover the nozzle, and when the push rod is arranged in its initial or normal position the finger 33a forms a closure for the nozzle of the collapsible tube, and when the push rod moves the bar 33 forward the finger or extension arm 33a, which is aligned centrally with the mouth of the tube, will also move forward, allowing the contents of the tube to be expelled, and when the bar 33 is retracted, supply of the contents will be shut off and leakage prevented. The threaded nozzle is adapted to be screwed into position so that the closure finger will properly engage the mouth of the collapsible tube and prevent leakage.

The downward movement of the blocks 17 and 19 causes the gears 22 and 23 to move downwardly on the racks 4 and 5, rotating the shafts 20 and 21, and causing the members 26 and 27 in their embracing relation with the inner end of the container or tube 28 to rotate and fold and consequently compress the container or tube 28 at the closed end thereof and force the desired quantity of material from the container or tube through the nozzle end 29 thereof and through the opening 30 in the end member 3 for use. Release of pressure on the push rod 41 causes the latter to move outwardly to normally inoperative position and the spring 40 connected to the bar 33 moves the latter back to normal position without rotating the ratchet wheels 31 and 32 backwardly because in such movement of the bar 33 the tapered ends 38 and 39 of the pivoted detents 36 and 37 ride over the teeth of the ratchet wheels. The said operation for the dispensing of the contents of the container or tube 28 is repeated step by step until the contents of the container or tube are exhausted when a new container or tube may be inserted in the bracket for dispensing the contents thereof as in the manner hereinbefore described.

When the contents of a tube are exhausted the bearing blocks may be retrieved over the screws to the starting position at the top of the screws by releasing the pins 6a which engage in the threads of the feed screws or worms 6 and 7. The bearing blocks will then be in a position for connecting them to a refill container or tube.

While I have illustrated one particular means for operatting the feed screws or threaded elements 6 and 7 it will be understood that other means may be employed for the purpose so long as such other structure is confined within the scope of the claims appended hereto.

It will now be apparent that as the threaded elements 6 and 7 are periodically partially rotated, there is a downward step by step movement of the bearing blocks and a consequent partial rotative movement imparted to the gears 22 and 23 by the racks 4 and 5 which imparts rotative movement to the squeezing or compressing means 26 and 27 which squeezes or folds the tube or container 28 step by step or gradually, the squeezing means 26 and 27 moving downwardly along the tube or container to the nozzle end thereof to discharge the contents of the tube or container therefrom, step by step, through the orifice or opening 30. When the contents of the tube or container 28 have been ejected the nozzle end 29 of the tube or container may be removed from the orifice or opening 30 and from between the elements 26 and 27 and a filled container or tube inserted as should be understood.

What is claimed is:

1. A dispensing device for collapsible containers comprising a support including a body portion having laterally directed horizontally disposed

upper and lower end members and spaced longitudinally arranged series of corrugations forming a pair of longitudinal racks, spaced, longitudinally disposed feed screws journaled in said end members and arranged within said racks, transversely aligned bearing blocks having screw-threaded connection with said feed screws, transversely aligned shafts journaled in said bearing blocks and carried by the same, means connected with the inner ends of the shafts for engaging a collapsible container, gears carried by the outer ends of the shafts and meshing with the racks of the support for rotating the shafts to collapse the container, and means for rotating said feed screws to move said bearing blocks along the feed screws and simultaneously rotate said gears to rotate said shafts and collapse the container.

2. A dispensing device for collapsible containers comprising a support including a body portion having laterally directed horizontally disposed upper and lower end members and spaced longitudinally arranged series of corrugations forming a pair of longitudinal racks, spaced, longitudinally disposed feed screws journaled in said end members and arranged within said racks, transversely aligned bearing blocks having screw-threaded connection with said feed screws, transversely aligned shafts journaled in said bearing blocks and carried by the same, means connected with the inner ends of the shafts for engaging a collapsible container, gears carried by the outer ends of the shafts and meshing with the racks of the support for rotating the shafts to collapse the container, ratchet wheels fixed to the feed screws, a slidable bar on the lower end member having spaced detents arranged to impart a step by step movement of said ratchet wheels to partially rotate the same simultaneously, and a slidable push rod provided with a tapered portion arranged to engage and operate said bar in one direction to partially rotate said ratchet wheels.

3. A dispensing device for collapsible containers comprising a support, spaced parallel racks on the support, spaced feed screws, journaled on the support, bearing blocks having screw-threaded mounting on said feed screws for movement therealong, shafts journaled in said bearing blocks and carried thereby, means connected with the inner ends of the shafts for engaging a collapsible container, gears carried by the outer ends of said shafts and meshing with said racks for rotating the shafts upon rotation of the feed screws to collapse the container, and means for rotating said screws.

4. A dispensing device for collapsible containers comprising a support including a body portion having laterally directed horizontally disposed upper and lower end members and spaced longitudinally arranged series of corrugations forming a pair of longitudinal racks, spaced, longitudinally disposed feed screws journaled in said end members and arranged within said racks, transversely aligned bearing blocks having screw threaded connection with said feed screws, transversely aligned shafts journaled in said bearing blocks and carried by the same, means connected with the inner ends of the shafts for engaging a collapsible container, gears carried by the outer ends of the shafts and meshing with the racks of the support for rotating the shafts to collapse the container, ratchet wheels fixed to the feed screws, a transversely slidable bar on said support and having spaced detents to engage said ratchet wheels to impart partial rotation to the same and to said feed screws, and a push rod slidably mounted on the support to engage and actuate said bar.

5. A dispensing device for collapsible containers comprising a support, spaced parallel racks on the support, spaced threaded elements journaled on the support and arranged in parallelism with said racks and spaced therefrom, bearing blocks having means for engagement with said threaded elements for movement along the latter, shafts journaled in said bearing blocks and carried by the same, slightly spaced elements connecting the inner ends of said shafts and adapted to engage opposite sides of the container to fold and collapse the latter upon rotation of said shafts, gears carried by the shafts and meshing with said racks to rotate said shafts upon rotation of said threaded elements, and means for rotating said threaded elements.

6. A dispensing device for collapsible containers comprising a support, spaced parallel racks on the support, spaced threaded elements journaled on the support and arranged in parallelism with said racks and spaced therefrom, bearing blocks having means for engagement with said threaded elements for movement along the latter, shafts journaled in said bearing blocks and carried by the same, slightly spaced elements connecting the inner ends of said shafts and adapted to engage opposite sides of the container to fold and collapse the latter upon rotation of said shafts, gears carried by the shafts and meshing with said racks to rotate said shafts upon rotation of said threaded elements, said support including an outwardly directed end portion having an aperture therein to receive the open end of the container for dispensing the contents of the container upon collapsing of the latter, and means for rotating said threaded elements.

7. A dispensing device for collapsible containers comprising a support, spaced parallel racks on the support, spaced threaded elements journaled on the support and arranged in parallelism with said racks and spaced therefrom, bearing blocks having means for engagement with said threaded elements for movement along the latter, shafts journaled in said bearing blocks and carried by the same, means between the shafts to embrace the container to fold and collapse the latter upon rotation of said shafts, gears carried by the shafts and meshing with said racks to rotate said shafts upon movement of said bearing blocks upon rotation of said threaded elements, and means for rotating said threaded elements.

8. A dispensing device, comprising a support to hold a compressible container, oppositely disposed shafts between the inner ends of which the container is supported, threaded elements rotatably mounted on the support, bearing blocks slidable on said threaded elements and in which said shafts are journaled, spaced elements connecting the inner ends of said shafts and disposed on opposite sides of the container to squeeze the latter upon rotative movement of said shafts, means for operating said threaded elements to move said bearing blocks along the same, and means to rotate the shafts as the bearing blocks move along said threaded elements.

9. A dispensing device for collapsible containers comprising a support including a body portion having laterally directed horizontally disposed upper and lower end members and spaced longitudinally arranged series of corrugations forming a pair of longitudinal racks, spaced, longitudinally disposed feed screws journaled in said end members and arranged within said

racks, transversely aligned bearing blocks having screw-threaded connection with said feed screws, transversely aligned shafts journaled in said bearing blocks and carried by the same, means connected with the inner ends of the shafts for engaging a collapsible container, gears carried by the outer ends of the shafts and meshing with the racks of the support for rotating the shafts to collapse the container, ratchet wheels fixed to the feed screws, a slidable bar on the lower end member having spaced detents arranged to impart a step by step movement of said ratchet wheels to partially rotate the same simultaneously, said slidable bar being provided with a closure finger normally arranged to close the mouth of the collapsible container, adapted to be carried away from the said mouth by the movement of the slidable bar, and operating means for moving the slidable bar.

10. A dispensing device for collapsible containers comprising a support, spaced parallel racks on the support, spaced threaded elements journaled on the support and arranged in parallelism with said racks and spaced therefrom, bearing blocks having threaded engagement with said threaded elements for movement along the latter, shafts journaled in said bearing blocks and carried by the same, slightly spaced elements connecting the inner ends of said shafts and adapted to engage opposite sides of the container to fold and collapse the latter upon rotation of said shafts, gears carried by the shafts and meshing with said racks to rotate said shafts upon rotation of said threaded elements, said support including an outwardly directed end portion having an aperture therein to receive the open end of the container for dispensing the contents of the container upon collapsing of the latter, and means for imparting a step by step rotative movement to the threaded elements and for simultaneously opening and closing the open end of the collapsible container.

11. A dispensing device for collapsible containers comprising a support including a body portion, a pair of spaced longitudinal racks mounted on said body portion, spaced longitudinally disposed feed screws journalled on said body and arranged within said racks, transversely aligned bearing blocks having screw-threaded connection with said feed screws, transversely aligned shafts journalled in said bearing blocks and carried by the same, means connected with said transversely aligned shafts for engaging a collapsible container, gears carried by the outer ends of the shafts and meshing with said racks for rotating the shafts to collapse the container, ratchet wheels fixed on said feed screws, a slidable bar mounted on the body portion and having spaced detents arranged to impart a step by step movement to said ratchet wheels to partially rotate the latter simultaneously, said slidable bar carrying a closure finger normally arranged to close the mouth of the collapsible container, adapted to be carried away from the said mouth by the movement of said slidable bar, and operating means for moving the slidable bar.

12. A dispensing device for collapsible containers comprising a supporting means, means for collapsibly supporting a collapsible container on said supporting means including means for collapsing said container to discharge material therefrom, means for operating the collapsible means including a bar slidably mounted on the supporting means and provided with a closure element projecting therefrom and normally arranged to close the mouth of the collapsible container, said bar having a laterally directed portion, and a push rod mounted on said supporting means and having one end engageable with the laterally directed portion of said slidable bar to move the latter in one direction to operate said collapsing means and to carry said closure element away from the mouth of the container, and means for moving said rod and said closure element to normal position when said push rod is released.

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