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DISPENSER FOR COLLAPSIBLE TUBES HAVING TUBE-SQUEEZING ROLLERS

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This invention relates to new and useful improvements in dispensing devices and the primary object of the present invention is to provide inner and outer slidably connected cases and a carriage movable in a step-by-step manner within the outer case as the outer case is moved toward and away from the inner case and supporting a pair of rollers that will compress one end of a collapsible tube supported within the cases.

Another important object of the present invention is to provide a dispenser for collapsible tubes wherein the carriage is movable in a step-by-step manner in the outer case through the medium of pawls on the carriage and toothed bars in the outer case engaging the pawls together with a manually actuated mechanism connected to the pawls for disengaging the pawls with the bars.

Yet another object of the present invention is to provide a dispenser of the aforementioned character including a pair of gripping blocks that will grip the closed end of a collapsible tube and which will prevent upsurge of the rollers as the outer case is moved from the inner case.

A further object of the present invention is to provide a dispenser for collapsible tubes involving a pair of separable housing forming members that are quickly and readily assembled or disassembled for cleaning and for the insertion of or removal of a collapsible tube from the housing forming members.

A still further aim of the present invention is to provide a dispenser for collapsible tubes that is simple and practical in construction, strong and reliable in use, small and compact in structure, neat and attractive in appearance, inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a front elevational view of the present invention and with parts broken away for the convenience of explanation;

Figure 2 is a vertical sectional view taken substantially on the plane of section line 2—2 of Figure 3;

Figure 3 is a vertical sectional view taken substantially on the plane of section line 3—3 of Figure 2;

Figure 4 is a horizontal sectional view taken substantially on the plane of section line 4—4 of Figure 2; and,

Figure 5 is a fragmentary vertical sectional view taken substantially on the plane of section line 5—5 of Figure 4.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a housing composed of an upper and outer elongated case 12 and a lower and inner shallow case 14.

The lower edges of the vertical walls forming the case 12 are provided with vertical slots 16 between their inner and outer faces that slidably receive the relatively thin vertical walls of the lower case 14. Dogs 18 are pivoted on the side walls of the outer case and include ends 20 that extend through openings 22 in the side walls of the outer case and into vertical slots 24 provided in the side walls of the lower case to limit sliding movement of the outer case from the inner case.

Spring seats 26 are provided on the inner face of the bottom wall for the lower case 14 and receive the lower ends of coil springs 28. The upper ends of the coil springs 28 are positioned in additional spring seats 30 that are integrally formed with the side walls of the outer case 12. The springs 28 yieldingly urge the upper case 12 raised from the lower case with the ends 20 of the dogs 16 against the upper edges of the slots 24.

Horizontal guide channels 32 on the bottom wall of the lower case 14 receive the horizontal legs of angle brackets 34 that are apertured to receive fasteners whereby the outer case is secured to a supporting structural member, such as a wall.

The side walls of the outer case 12 are provided with forward and rear vertical grooves 36 and 38 that slidably receive the ends of forward and rear substantially rectangular plates 40 and 42.

The plates 40 and 42 are joined by cross-plates 44 and 46 and the plates 40, 42, 44 and 46 form a carriage that is slidably vertically within the upper case.

A pair of horizontal pivots 48 and 50 are rotatably supported on the plates 40 and 42. The pivots 48 and 50 extend rearwardly through the plates 40 and 42, and fixedly support pawls 52 and 54. Toothed bars 56 and 58 are integrally formed with the side walls of the upper case and include downwardlyinclined teeth that successively engage the pawls 52, 54.
Means is provided for moving the pawls 52 and 54 out of engagement with the teeth of the bars 56 and 58. This means comprises a horizontal shaft 60 that is rotatably supported by the plate 46 and which is slidably in a vertical slot 52 in the forward wall of the upper case 12. The shaft 60 supports an upstanding arm 62 and a depending arm 64. The forward ends of the pivots 46, 50 project forwardly through the plate 46 and support upstanding links or arms 68 and 70 that are connected to the arms 62 and 64, respectively, by pins or links 72 and 74, so that as the knob 76, attached to the forward end of the shaft 60 is rotated to raise the arrow thereon, the pawls 52 and 54 will be raised away from the bars 56 and 58.

A vertical tubular member or sleeve 18 extends downwardly through the bottom wall of the lower case 14 and its lower end is normally closed by a spring urges vertically swingable closure 80 that is pivotally mounted on the bottom wall of the lower case. The upper end of the sleeve 18 is embraced by a resilient, preferably rubber sleeve 82 having an internally threaded upper end that receivably engages the threaded neck of a collapsible tube 7 to support the tube 7 within the upper and lower cases 12 and 14.

The carriage C and more specifically the forward and rear plates 40 and 42 are formed with downwardly converging upper and lower slots 84 and 86. The slots 84 slidably receive the ends of roller shafts 88 on which rollers 80 are mounted. The forward and rear ends of the shafts 88 project through the plates 40 and 42, and are joined by looped springs 92 whose ends terminate in hooks that embrace the forward and rear ends of the shafts 88 to urge the shafts 88 downwardly in the slots 84 and the rollers 90 toward each other and against the closed end E of the tube 7 that extends upwardly between the two rollers.

The slots 86 slidably receive protuberances or lugs 84 on the ends of a pair of gripping blocks 96 having serrated inner faces for gripping the closed end of the tube T and concave lower faces conforming to the curvature of the rollers 90. The concave faces of the blocks 96 provide a frictional area for the rollers 90 and therefore prevent upsurge of the rollers caused by spring load returning ratchet racks 56, 58 to their normal position. The upper faces of the blocks 96 are so shaped as to permit a person's thumb being used to relieve lock pressure by outward movement.

In practical use of the present invention, the inner case 14 is first mounted upon a supporting structure by the brackets 34 or by suction caps attached to the inner case 14. The upper ends of the dog 18 are then forced toward the side walls of the upper case to move the ends 20 out of the slots 24 and permit removal of the upper case from the lower case by raising the upper case from the lower case.

The neck of a tube T, after the usual cap is removed from the tube, is threaded in the sleeve 32 and the upper case is applied to the lower case with the closed end of the tube passing upwardly between the rollers 90 and the blocks 96.

A toothbrush is grasped by the user's hand and inserted in the swivel 98 depending from the forward wall of the upper case 12. The cap 88 is moved manually to its open position and the upper case is lowered by a downward pressure of the toothbrush against the swivel and by additional downward pressure of the user's finger on a finger grip 100 on the case 12 if necessary.

As the outer and upper case 12 is lowered toward the lower case 14, the rollers 90 will ride against the tube and urge the blocks 96 into clamping engagement with the tube so that when the outer case is released, the bars 56, 58 will ratchet past the pawls 52, 54. Therefore, each time the outer case is lowered and released, the carriage will move downwardly a slight amount within the outer case until all the contents of the tube has been discharged.

Having described the invention, what is claimed as new is:

1. A dispenser for collapsible tubes comprising a lower inner case, an upper outer case slidably carried by the inner case, means mounted on said inner case for attaching the inner case to a supporting structure, a sleeve carried by the inner case for engaging the neck of a collapsible tube to support the tube in an upright position within both cases, a carriage slidably mounted in the outer case, a pair of tube squeezing rollers carried by the carriage for receiving the closed end of a tube therebetween and adapted to depress the tube and force a paste from the tube during movement of the carriage toward the tube, and means for locking the carriage to the outer case for lowering of the carriage with the outer case, said carriage including forward and rear plates each having a pair of downwardly converging slots therein receiving said rollers, and spring means joining said rollers and urging the rollers toward each other.

2. A dispencer for collapsible tubes comprising a lower inner case, an upper outer case carried by the inner case, means mounted on said inner case for attaching the inner case to a supporting structure, a sleeve carried by the inner case for engaging the neck of a collapsible tube to support the tube in an upright position within both cases, a carriage slidably mounted in the outer case, a pair of tube squeezing rollers carried by the carriage for receiving the closed end of a tube therebetween and adapted to depress the tube supported by the sleeve to force paste from the tube through the sleeve during movement of the carriage toward the sleeve, spring means biased between said inner and outer cases and urging said cases apart, stop means limiting sliding movement of said cases from each other, a pair of toothed vertical bars within the outer case and including downwardly inclined teeth, and a pair of pawls pivoted on said carriage and inclining upwardly from the carriage and engaging the teeth of said bars to retain the carriage in a selected moved position, and means carried by the carriage and connected to the pawls for releasing the pawls from the bars.

3. The combination of claim 2 wherein said means for releasing the pawls includes a horizontal shaft rotatably supported by said carriage, said outer casing having a vertical slot slidably receiving the shaft, an upstanding arm on said shaft, a depending arm on the shaft, a first pitman connecting the upstanding arm to one pawl, and a second pitman connecting the depending arm to the other pitman.

4. A dispenser for collapsible tubes comprising a lower inner case, an upper outer case slidably carried by the inner case, means carried by the inner case for attaching the inner case to a supporting structure, a dispensing sleeve slidably carried within the inner case for engaging the neck of a collapsible tube to support the tube in an up-
right position in both cases. spring means between the cases urging the outer case raised from the inner case, stop means limiting upward sliding movement of the outer case from the inner case, a carriage slideable vertically within the outer case, a pair of vertical bars within the outer case and including downwardly inclined teeth, a pair of vertically swingable paws mounted on the carriage and inclining upwardly and outwardly from the carriage and engaging a tooth of each bar to permit downward movement of the carriage with the outer case, a pair of spaced parallel horizontal tube gripping and squeezing rollers mounted on the carriage for receiving the closed end of a collapsible tube supported within the cases, manually operated means on said carriage and connected to said paws for moving the paws out of engagement with said teeth, said rollers being slideable downwardly and inwardly on said carriage toward each other, means connecting and urging the rollers toward each other, and means slidably carried by said carriage and engaging said rollers to prevent upsurge of said rollers as the outer case is raised by the spring means after the outer case and carriage have been lowered relative to the inner case.

5. The combination of claim 4 wherein said last named means includes a pair of gripping blocks having concave faces contacting said rollers, said blocks having inner toothed faces for gripping a collapsible tube passing upwardly between said rollers.

6. A dispenser for collapsible tubes comprising a lower inner case, an outer upper case slideably carried by the inner case, means carried by the inner case for attaching the inner case to a supporting structure, a dispensing sleeve mounted within the inner case for engaging the neck of a collapsible tube to support the tube in an upright position in both cases, spring means between the cases urging the outer case raised from the inner case, a carriage slideable vertically within the outer case, means between the carriage and the outer case for vertically adjusting the carriage within the outer case, said means including a pair of paws on said carriage and vertically spaced teeth on said outer case, a pair of spaced parallel horizontal tube gripping and squeezing rollers mounted on the carriage for receiving the closed end of a collapsible tube supported within the cases, manually operated means on said carriage and connected to said paws for moving the paws out of engagement with said teeth, said rollers being slideable downwardly and inwardly on said carriage toward each other, means connecting and urging the rollers toward each other, and means slidably carried by said carriage and engaging said rollers to prevent upsurge of said rollers as the outer case is raised by the spring means after the outer case and carriage have been lowered relative to the inner case.

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