

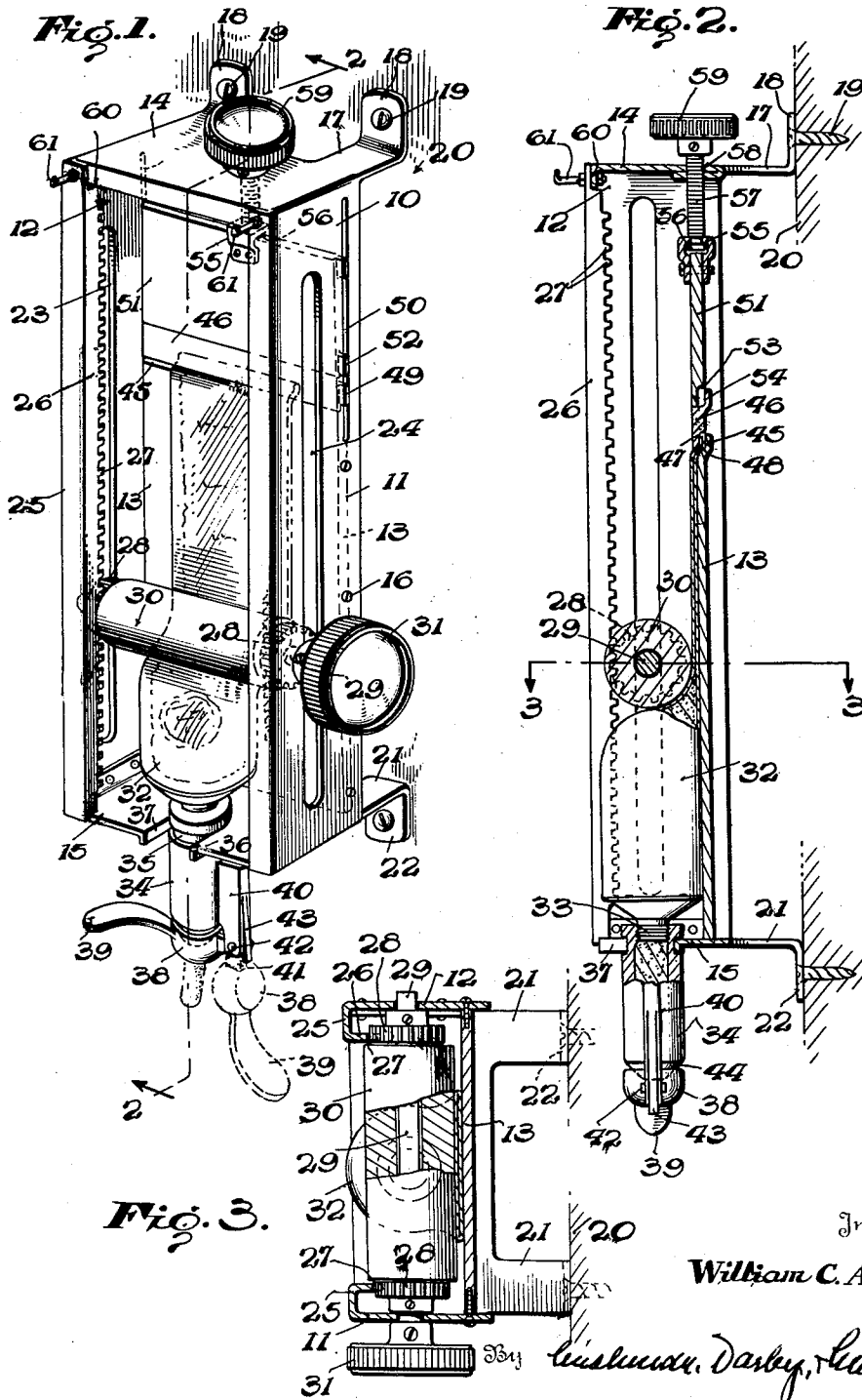
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W. C. ALLEN

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COLLAPSIBLE TUBE DISPENSER

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Inventor

William C. Allen.

Cushman, Darby, Cushman
Attorneys

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COLLAPSIBLE TUBE DISPENSER

William C. Allen, Houston, Tex.

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The present invention relates to dispensing devices and refers particularly to means for dispensing plastic material such as tooth paste and shaving cream from collapsible tubes. In devices of this character, it is quite common to provide a pressure roller movable longitudinally of the device to squeeze the plastic material from the tube as the latter is collapsed by the roller.

One of the objects of the present invention is to provide a roller which requires a minimum of effort to operate. This is accomplished by employing a roller spindle having one or more pinions which mesh with suitable racks to positively rotate the spindle, and a tube engaging roller loosely or freely journaled on the spindle. With this arrangement, the spindle is capable of rotary movement relative to the roller and the roller is not forced to rotate with the spindle during the tube squeezing operation, thus materially reducing the force necessary to dispense material from the tube.

A further object is the provision of a dispenser of this character having means for accommodating and securely clamping tubes of different sizes in operative dispensing position.

Another object is to provide a detachable valve controlled discharge fitting for collapsible tubes which may be easily and quickly applied to a tube and then locked in convenient position in the frame of the dispenser.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawing, in which:

Figure 1 is a perspective view of the dispenser showing a partially collapsed tube mounted in dispensing position;

Figure 2 is a vertical section on line 2-2 of Figure 1; and

Figure 3 is a horizontal section on line 3-3 of Figure 2.

Referring now to the drawing, the numeral 10 designates generally my dispensing device comprising a substantially rectangular frame having side walls 11 and 12 respectively, a rear wall 13, and top and bottom walls 14 and 15. This frame may be constructed in any desired manner, but as shown in the drawing, the top, bottom and side walls are preferably stamped from a single blank of material. After the blank has been shaped to the form shown in the drawing, the rear wall 13 is secured in position by suitable fastening elements such as the screws 16.

The top wall 14 is provided with integral rearwardly extending arms 17, each of which ter-

minates in an upwardly extending lug or ear 18 provided with an opening for receiving a fastening element 19 by which the frame may be secured to a supporting surface such as the wall 20. In like manner, the bottom wall 15 is provided with a pair of spaced rearwardly extending arms 21, each terminating in an apertured lug 22 by which the lower portion of the frame may be secured to the wall 20.

Side wall 12 is provided with a longitudinally extending slot 23 which is in alignment with a slot 24 formed in the side wall 11. Each side wall is also extended inwardly to form a front strip 25 which in turn is bent rearwardly to provide a flange 26 having its free edge shaped to form a plurality of teeth and constituting a longitudinally extending rack 27. The racks 27 cooperate and mesh with a pair of spaced pinions 28 rigidly secured to opposite ends of a roller spindle 29. The extreme ends of the spindle project through the slots 23 and 24, which constitute guides for holding the pinions in mesh with the racks and permit movement of the spindle longitudinally of the frame 10. A collapsible tube engaging roller 30 is loosely or freely mounted on the spindle 29 while an operating handle 31 is rigidly secured to one end of the spindle exteriorly of the frame, as clearly shown in Figures 1 and 3.

With the construction thus far described, and assuming that a loaded collapsible tube 32 of plastic material, such as tooth paste or shaving cream, is placed in the frame, the contents may be easily and quickly dispensed by operating the handle 31. This effects a positive rotation of the spindle 29 by reason of the meshing of the pinions 28 with the racks 27. The roller 30, however, being loosely journaled on the spindle is free to rotate relative to the spindle. Thus, under ordinary conditions, movement of the handle 31 in a clockwise direction (see Figure 1), will rotate the spindle in a like direction and move the latter downwardly in the frame. The roller 30 being freely mounted on the spindle 29 will not be forced to rotate in the same direction as a spindle, but by reason of its frictional contact or engagement with the tube, will normally rotate in a counter-clockwise direction in effecting a squeezing or pressing action on the tube. With this arrangement, less force is required to squeeze the material from the tube, since the roller is merely carried by and not positively rotated with the spindle.

The contents of the tube may, of course, be dispensed directly from the threaded opening 33, as

but I prefer to utilize a valve discharge fitting 34 having one end threaded to receive the threaded end 33 of the tube and provided with an annular groove or recessed portion 35 adjacent its threaded end. In placing the loaded tube into the casing, the discharge fitting 34 is inserted in a forwardly opening slot 36 formed in the bottom wall 15. This slot is embraced by a continuous downwardly extending flange 37 which is of a width to fit the annular groove 35 and cooperates therewith to maintain the fitting 34 in operative position. At the lower end of the fitting 34 is mounted a valve 38 having a handle 39 for moving the same from open to closed position (see Figure 1). This valve is pivoted between the spaced walls of a support 40 extending laterally of the fitting, and is provided with straight edge portions 41 adjacent its pivot point 42 which are alternately engagable with the free end of a spring 43. This spring is placed under sufficient tension to maintain the valve in both its open and closed positions. The lower end of the fitting is preferably provided with a conical ground portion 44 which cooperates with a ground portion of the valve to form a tight fit when the valve is seated.

In order to accommodate tubes of different sizes and to effectively clamp said tubes in operative position, I provide a pair of clamping plates which cooperate with the rear wall 13 to secure the flat end of a tube in the frame. Referring particularly to Figures 1 and 2, it will be observed that the extreme upper end of the rear wall 13 is provided with a stepped or shouldered portion 45. Directly above the rear wall 13 and in substantially the same vertical plane, is mounted a plate or bar 46. The lower end of this bar is cut away to provide a rearwardly positioned shoulder 47 which cooperates with the shoulder 45 to securely clamp the flat end 48 of the tube in the frame. The bar 46 is freely movable in the frame by reason of the lugs 49 engaging aligned slots 50 formed in the side walls, in rear of the slots 24 and 25. A second clamping plate 51 is positioned above the bar 46 and is provided with ears 52 also engagable with the slots 50. The lower edge of this plate is provided with a rearwardly positioned shoulder 53 cooperating with a forwardly located shoulder 54 formed in the upper end of the bar 46. To the upper end of the plate 51 is secured a bracket 55 which receives the head 56 of a threaded post 57 and cooperates therewith to form a swivel joint or connection between the post and plate 51. The post 57 passes through a threaded opening 58 in the top wall 14 and has its extreme upper end fixed to an operating handle 59.

When it is desired to clamp a small size tube in the dispenser, the handle 59 is operated to move the plate 51 upward sufficiently to permit a person to slide the lower plate or bar 46 away from the shoulder portion 48 of the rear wall 13. Thereafter, the flat end of a loaded tube may be easily and quickly positioned in the shoulder 48. The bar 46 may then be dropped so that its shoulder 47 engages the tube. Operation of the handle 59 will then move the upper plate 51 down upon the bar 46 until sufficient pressure has been applied to securely clamp the end of the tube between the wall 13 and the bar.

Assuming that a relatively large size tube is to be inserted in the frame, the bar 46 is moved to its lowermost position whereby the shouldered portions 47 and 48 are in direct contact. The handle 59 is operated to raise the upper plate 51 to allow sufficient clearance for the reception of the flat end of the tube between the shouldered

portions 53 and 54. By reversing the rotation of the handle 59, the plate 51 will then be moved downwardly into engagement with the end of the tube whereby the same is effectively clamped between the bar and plate.

It is to be understood that the bar 46 and plate 51 may be increased in size to take care of existing conditions. Furthermore, two or more bars may be provided, if desired, to take care of a greater variety of tubes. In the present manufacture of tooth paste and shaving cream, there are standard small and large size tubes and the present clamping arrangement is designed to accommodate these large and small tubes.

It will be observed that the top portions of the strips 25 are secured to a downwardly extending flange 60, by means of suitable fastening elements 61. These fastening elements are preferably extended outwardly to constitute pegs in order that tooth brushes or other toilet articles may be conveniently hung or supported on the frame.

If desired, a cover or door (not shown) may be hinged to the front of the frame for the purpose of excluding dust and other foreign matter from the interior of the casing. This cover and the rest of the frame may be decorated in any suitable manner. It is to be further understood that such variations from the construction herein shown and described as are within the skill of a mechanic may, of course, be made without departing from the range of my invention.

I claim:

1. In a dispensing device of the class described, a frame for holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame including a pair of spaced side walls and a rear wall extending between and non-movably connected to the side walls, means for clamping a tube in the frame comprising a plate slidably mounted between the side walls and in substantially the plane of the rear wall, and means for moving said plate into and out of operative engagement with the rear wall whereby the end of a collapsible tube may be clamped between the plate and wall.

2. In a dispensing device of the class described, a frame for holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame including a pair of spaced side walls and a rear wall extending between and non-movably connected to the side walls, one end of the rear wall terminating short of the ends of the side walls and said side walls being provided with aligned slots, a clamping plate slidable in said slots to and from the end of the rear wall, and means for moving said plate into and out of clamping engagement with the rear wall whereby the flat end of a collapsible tube may be clamped between the plate and wall.

3. In a dispensing device of the class described, a frame for holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame including a pair of spaced side walls and a rear wall extending between and non-movably connected to the side walls, one end of the rear wall terminating short of the ends of the side walls and provided with a shoulder cut out of its front face, a clamping plate slidably mounted between the side walls and provided at one end with a shoulder cut out of its rear face and adapted to cooperate with the first mentioned shoulder to clamp the flat end of a collapsible tube in the frame, and means for moving said plate into and out of tube clamping position.

4. In a dispensing device of the class described, a frame for holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame including a pair of spaced side walls and a rear wall extending between and non-movably connected to the side walls, means for clamping tubes of different lengths in said frame comprising a plate freely slidable to and from one end of the rear wall, a second plate slidable to and from the first plate, and means connected to the second plate for moving the latter into tube clamping engagement with the first plate and the first plate into tube clamping engagement with the rear wall.

5. In a dispensing device of the class described, a frame for holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame including a pair of spaced side walls and a rear wall extending between and non-movably connected to the side walls, one end of the rear wall terminating short of the ends of the side walls and said side walls being provided with aligned slots, a clamping plate freely slidable in said slots to and from the end of the rear wall, a second plate slidable in said slots to and from the first plate, and means connected to the second plate for moving the latter into tube clamping engagement with the first plate and the first plate into tube clamping engagement with the end of the rear wall whereby tubes of different lengths may be detachably clamped in the frame.

6. In a dispensing device of the class described, a frame for holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame including a pair of spaced side walls, a rear wall extending between and non-movably connected to the side wall, and an end wall having a threaded opening therethrough, means for clamping a tube in the frame comprising a plate slidably mounted between the side walls and in substantially the plane of the rear wall, and a threaded post passing through the opening in the end wall and having its inner end swivelled to said plate whereby rotation of the post will move the plate into and out of clamping engagement with said rear wall.

7. In a dispensing device of the class described, the combination of a rectangular frame having a substantially open front for the reception of a loaded collapsible tube, the bottom wall of said

frame having a rearwardly extending cutaway portion forming an open slot for receiving a discharge fitting, a collapsible tube fitting into said frame, and a discharge fitting detachably secured to said tube and provided with a grooved collar engaging the slot, said fitting having a valved portion projecting below the bottom wall in position to dispense material as the tube is collapsed.

8. In a dispensing device of the class described, a substantially rectangular frame for receiving and holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame having a rear wall, a pair of spaced side walls provided with longitudinally extending aligned slots, a pair of spaced front strips each extending inwardly from a side wall, at least one of said strips having a rearwardly extending flange, the rear edge of which is provided with teeth forming a longitudinally extending rack facing the rear wall, a roller spindle having one end engaging one slot and the other end projecting through the other slot, a pinion fixed to said spindle and meshing with said rack, a handle fixed to the projecting end of the spindle exteriorly of the frame, and a tube engaging roller mounted on the spindle and adapted to be brought into contact with a loaded tube for dispensing the contents of the tube.

9. In a dispensing device of the class described, a substantially rectangular frame for receiving and holding a loaded collapsible tube in position to allow material to be dispensed from the tube, said frame having a rear wall, a pair of spaced side walls provided with longitudinally extending aligned slots, a pair of spaced front strips each extending inwardly from a side wall, each of said strips having a rearwardly extending flange, the rear edge of which is provided with teeth forming a longitudinally extending rack facing the rear wall, a roller spindle having one end engaging one slot and the other end projecting through the other slot, a pair of pinions fixed to opposite ends of the spindle and meshing with said racks, a handle fixed to the projecting end of the spindle exteriorly of the flange, and a tube engaging roller mounted on the spindle and adapted to be brought into contact with a loaded tube for dispensing the contents of the tube.

WILLIAM C. ALLEN.