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P. G. DARLING

DISPENSING DEVICE

Filed March 16, 1922

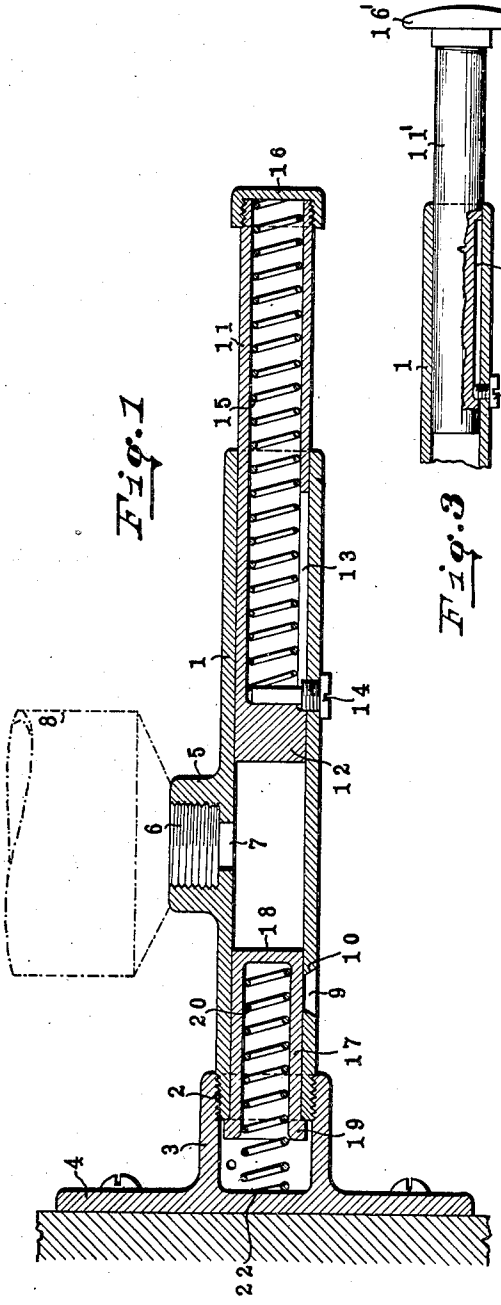


Fig. 1

Fig. 3

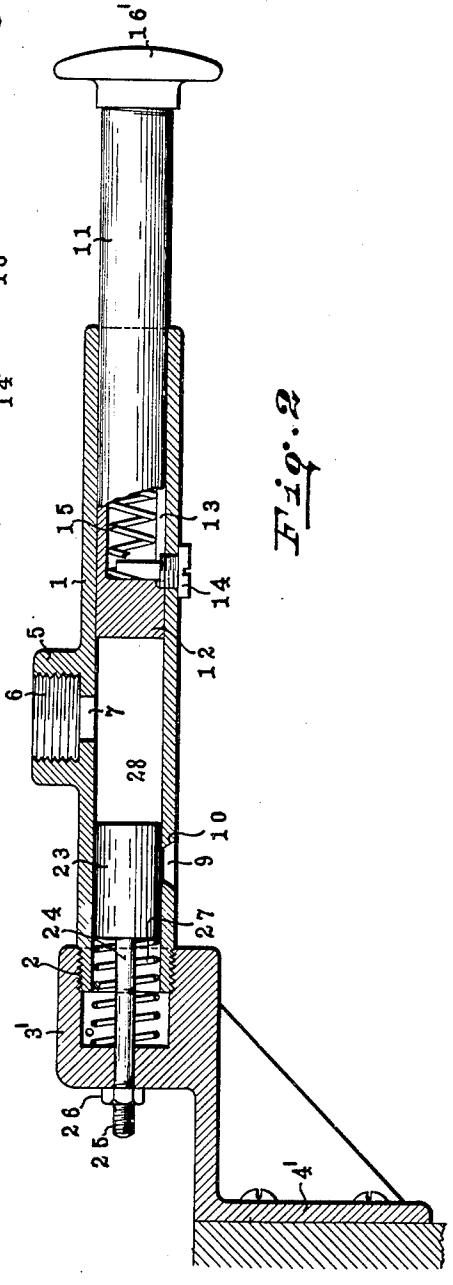


Fig. 2

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UNITED STATES PATENT OFFICE.

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DISPENSING DEVICE.

Application filed March 16, 1922. Serial No. 544,162.

To all whom it may concern:

Be it known that I, PHILIP G. DARLING, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Dispensing Devices, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to dispensing apparatus and more especially to that type of predetermined bulk dispensing apparatus which is adapted to dispense dentifrice preparations, soap, or the like, in either powder, paste or liquid form and which is adapted to be used in lavatories, barber shops and other places where a neat and practical device is desired.

An object of the invention is to provide a device which is simple, compact, practical and efficient.

Another object is to provide a dispensing device which is especially adapted to receive its charge from the reservoir as a direct result of a vacuum produced in the dispensing chamber of the device.

A further object of the invention is to provide a dispensing device to which a commercial package of dentifrice preparation, shaving cream, or the like, may be readily attached for use, and which, when it is exhausted of its contents, may be easily replaced by a fresh container.

The invention consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings forming part of this specification and wherein similar reference characters refer to the similar parts throughout the several views, there are shown some of the various possible embodiments of the invention,

Figure 1 is a longitudinal section of one form of the device.

Figure 2 is a sectional view wherein is illustrated a modified form of support and plunger at the left end of the device, and

Figure 3 is a partly broken away section of another form of a portion of the device.

The device comprises an open-end tube or barrel 1, having relatively thin walls, and threaded at its inner end at 2, for attachment to a threaded socket 3 carried by a bracket 4 which is adapted to be attached to a wall or like support in any suitable manner.

At one side of the tube or barrel 1, near the center thereof, is a nipple 5 provided with a passageway 7 which is internally threaded at 6 to receive a reservoir such for example as an air-tight collapsible dispensing tube of soft metal or the like. Viewing the invention in some aspects, however, it will be seen that other forms of reservoirs may be used such as a rigid reservoir having an opening at its top and that the reservoir might be integral with the member 1.

At the opposite side of the tube or barrel 1, and spaced longitudinally therefrom, is the outlet or discharge opening 9 which has outwardly flared walls 10. A piston 12 comprising a tubular stem 11 slides in the outer portion of the barrel 1. The longitudinal movement of this piston may be limited by a stop-pin 14 engaging a slot 13 in the stem 11. The piston 12 is retained in its normal outer position by an expansion spring 15. This spring is inserted through the outer end of the member 11 and is held therewithin by the cap 16, opposite ends of the spring bearing against the pin 14 and the cap 16 respectively.

The outlet opening 9 in Fig. 1 is adapted to be closed by a spring-pressed plunger 18 having a hollow stem 17 sliding in the barrel 1. This plunger is normally held in its inner position by a suitable spring 20 disposed within the hollow stem and bearing against the inner wall of socket 3 at 22. Both this plunger 18 and the piston 12 have a close fit with the interior of the member 1 so that when moved therein they are substantially air-tight although easily movable longitudinally, and their opposed faces conform to each other or are mated so that as the faces approach each other, substantially all of the material is forced from between them, in a manner which will be hereinafter described. The inward movement of the plunger 17 is limited by an out-turned flange 19 at the end of stem 17 which contacts with the inner end of the barrel 1. The outward movement of the plunger 17 is limited by the member 19 contacting against the inner face 22 of the socket 3. Thus

when the elements of the device are in their normal positions a receiving chamber 28 is formed between the piston 12 and the face 18 of the plunger 17 which is adapted to receive a charge of material from the reservoir.

In the form shown in Fig. 2 the barrel 1 and the piston 12 with its associated parts are substantially like the corresponding parts illustrated in Fig. 1, but the barrel 1 is mounted in an offset socket 3′ upstanding from a bracket 4′ adapted to be secured to a wall or like support in any suitable manner. The outlet opening 9 is closed by a solid plunger 23 having a stem 24 which is threaded at its outer end as at 25 to receive an adjusting nut 26 which is adapted to bear against the rear face of the socket 3′. This structure allows of varying the capacity of the charge receiving chamber 28 at will by adjusting the position of the plunger 23 so that when in normal position it may be disposed at different distances from the piston head 12. The plunger is held in its normal inner position by means of the coil-spring 27 which surrounds the stem 24 and bears against the rear side of the plunger 23 and the inner surface of the socket 3′, respectively. In this form of the device, the coil-spring 27, when compressed so that the coils thereof contact with each other, limits the rearward movement of the plunger 23 thus acting as a positive stop for the latter.

In the operation of the device any suitable reservoir as, for instance, a collapsible tube of shaving cream, is screwed into the threads 6 of the nipple 5 and the member 11 is forced inwardly by the operator. On the first stroke any air that is in the receiving chamber 28 will be compressed between the piston 12 and the plunger 18 after the piston 12 has passed the opening 7 until the pressure is sufficient to move the plunger 17 rearwardly against the tension of the spring 20, thus uncovering the outlet opening 9, inward motion of the member 11 being continued until the piston 12 contacts with the face 18 of the plunger 17 and the rearward motion of the plunger 17 is positively stopped by contact between the flange 19 and the inner face 22 of the member 4. Upon release of the pressure on the member 11, the spring 15 retracts the piston 12. The plunger 17 follows the piston closely, quickly closing the outlet opening 9, until the member 19 contacts with the inner end of the member 1. Further retraction of the piston 12 by the spring 15 thus produces a vacuum in the charge receiving chamber 28 and the air pressure on the walls of the collapsible reservoir 8, or, if a rigid reservoir with a vent opening be used, the air pressure upon the top of the material therein will force material from the reservoir into the receiving chamber 28. The vacuum which is formed during the time when the member 12 moves away from the face 18 until the member 12 uncovers the opening 7, becomes suddenly effective at the opening 7 which materially aids in the feeding of the material from the reservoir to the receiving chamber. Any further retraction of the member 12 increases the vacuum and further aids in the feeding of the material.

Upon a second inward movement of the member 11 any excess of material which has been fed down into the charge receiving chamber 28 is forced back into the reservoir until the member 12 closes the opening 7 whereupon the material between the piston 12 and the face 18 of the plunger 17 is placed under pressure and forces the plunger 17 rearwardly until the outlet opening 9 is uncovered whereupon the material is forcibly, quickly and efficiently discharged from said opening, the inward movement of the member 11 being continued until the rearward movement of the plunger 17 is positively stopped, whereupon the mating faces 18 and 12 contact and force out substantially all of the charge. Upon the release of the pressure on the member 11 it will quickly return to its outer position at the same time causing a vacuum to be formed in the charge receiving chamber 28 which again causes a charge of material to be fed thereinto from the reservoir. This charge of material is out of contact with the air for the reason that the outlet opening 9 is closed when it is in its unoperated position and, therefore, is ready, upon the next inward stroke of the member 11, to be discharged from the opening 9.

Fig. 3 shows another form of piston wherein the member 11′ is solid and no spring is used for retracting the same. A suitable limiting of the movement of this modification is produced by the slot 13′ and the stop-pin 14′. A suitably shaped or ornamented plate 16′ may be screwed on to or otherwise attached to the members 11 and 11′, if desired. In the use of this form the operation of the main portion of the device is the same as explained in connection with Fig. 1, with the exception that the member 11′ is retracted by pulling it out, there being no retracting spring 15.

In the device described, since the walls of the member 1 are relatively thin and the sides of the outlet opening 9 are outwardly flared clogging is substantially prevented since only a relatively thin layer of the material may be held in the opening 9 and the outwardly flared walls 10 will allow any adhering material to be ejected by a very small pressure.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing

from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the class described comprising a tubular barrel supported at one end, said barrel having an inlet opening in its side wall surrounded by an outstanding internally threaded nipple for the reception of the threaded neck of a collapsible dispensing tube, a piston provided with a tubular stem sliding in the outer portion of the barrel, a pin fixed in the barrel and projecting into the stem of the piston through a slot in the side wall of the stem, a helical spring disposed within the stem bearing at one end against the pin and at the other against a part carried by the stem, a plunger sliding in that end of the barrel at which the latter is supported, the barrel having an outlet opening longitudinally spaced from the inlet opening and normally covered by the plunger, and a spring for holding the plunger in normal position.

2. A device of the class described comprising, in combination, a support having a threaded socket angularly offset relative to the body of the support, a barrel having threaded engagement with said extension, said barrel having an opening in one side thereof adapted for communication with a reservoir, a piston in said barrel having a working fit therewith and reciprocable past said inlet opening, a discharge opening opposite to and spaced longitudinally from said inlet opening and a resiliently movable plunger in the barrel, having a working fit therewith and adapted to close the outlet opening, the piston and the plunger being spaced to provide a charge-receiving chamber, a stop pin in the barrel, a slot in the piston adapted to co-operate with the stop pin to limit the movement of the piston, a coil spring to resiliently hold the piston in its outer position, the said plunger having a stem which is adapted to extend through an opening in the tubular extension of the support and which is threaded at the outer end, an adjusting nut adapted to be screwed on the threaded end of the stem of the plunger, and a coil spring surrounding the stem and adapted to act between the rear of the plunger and the inner face of the socket to resiliently hold the plunger in its inward position and the coils of which are adapted, when the plunger is forced outwardly, to cause the plunger to be positively stopped at a point in its path of movement such that the discharge opening is at least partially uncovered when the piston contacts with the plunger, the adjusting nut being adapted to co-operate with the rear face of the socket to limit the inward movement of the plunger.

In testimony whereof I affix my signature.

PHILIP G. DARLING.