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APPARATUS FOR DELIVERING PORTIONS OF RELATIVELY MOBILE MATERIAL

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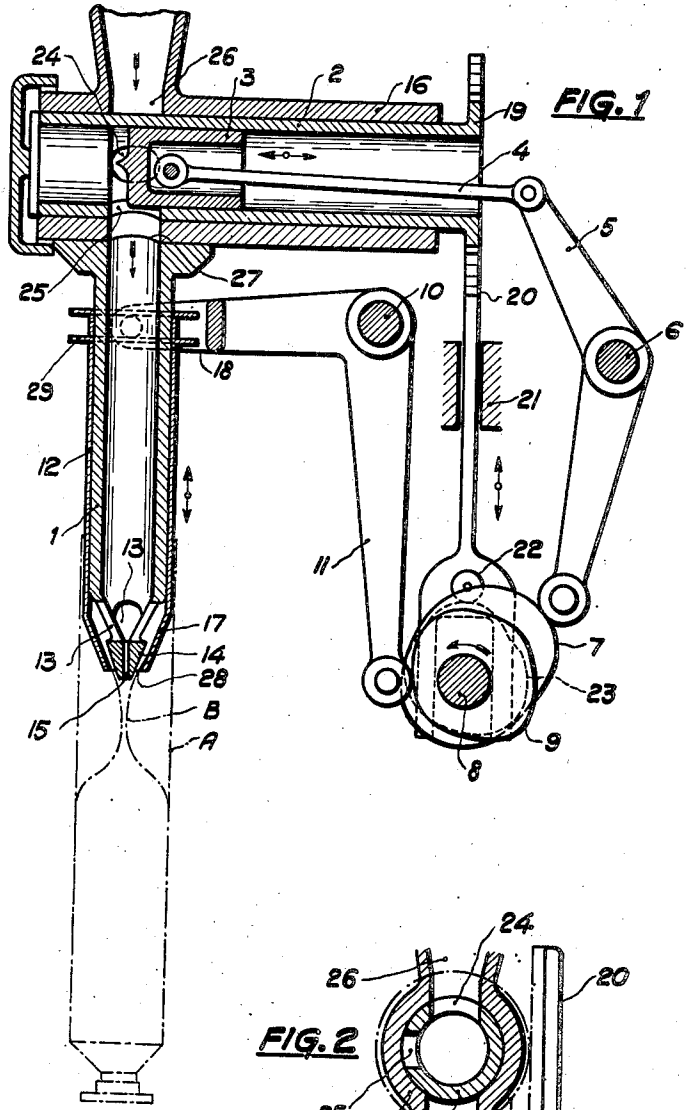

FIG. 1

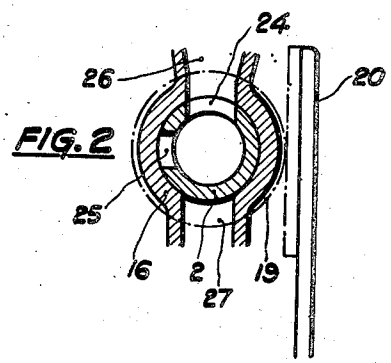

FIG. 2

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APPARATUS FOR DELIVERING PORTIONS OF RELATIVELY MOBILE MATERIAL

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5 Claims. (Cl. 226—125)

This invention relates to an apparatus for delivering portions of relatively mobile material, for instance paste, oil or the like, and is particularly suitable for filling of collapsible tubes or the like.

The invention has for an object to provide an apparatus of the kind referred to, enabling careful regulation at the part projecting into a tube or the like of the delivery of material in such manner that a complete control of the finishing of each charge of material is obtained, and so that the string of material obtained when finishing delivery of one portion is torn off in the desired manner and at the desired moment.

With this and other objects in view the invention comprehends the construction as hereinafter described and illustrated by way of example in the drawing, in which:

Fig. 1 is a vertical section through the apparatus, and

Fig. 2 is a cross sectional view of a pump forming part of the apparatus.

Referring to the drawing, a spout 1 is connected to a pump housing 16 which encloses a pump cylinder 2 adapted to turn and a piston 3 adapted to reciprocate in the cylinder 2. The piston is pivotally connected to one end of a piston rod 4 the other end of which is pivoted to a lever 5. The lever 5 is turnably mounted on a shaft 6 and its free end has a roller riding on a cam disc 7 which is secured to a continuously revolving driving shaft 8. To the shaft 8 is secured another cam disc 9 which actuates a lever 11 turnably mounted on a shaft 10. One end of the lever 11 has a fork 18 which straddles a sleeve 12 enclosing the spout 1, and is adapted to move up and down. The tapered end of the spout has lateral openings 13 and a conical valve seat 14 at the openings 13. The spout end projects out of an opening 28 of the sleeve 12 and has a narrow central hole 15. Possibly, the hole 15 may, however, be omitted. The sleeve 12, which constitutes the charge delivery valve, tapers at its mouth and its end 17 is interiorly tapered to form a sealing surface which may be regarded as a valve adapted to engage tightly the valve seat 14 of the spout 1. The upper flanged end 29 of the sleeve is straddled by the fork 18. The valve end 17 is tapered exteriorly also.

The pump cylinder 2 has at its outer end a toothed flange 19 which meshes with a toothed rack 20 which is movable up and down in a guide 21 and has a fork at its lower end. Said fork straddles the shaft 8 and carries a roller 22 which rides on a cam disc 23 secured to the shaft 8. The pump cylinder 2 has an inlet opening 24 and an outlet opening 25, which openings can alternately register with an inlet opening 26 and an outlet opening 27, respectively, in the pump housing 16.

The cam discs 7, 9 and 23 are arranged to impart to the piston 3, the valve sleeve 12 and the cylinder 2, respectively, timed movements in a manner to be described hereinafter.

It is imagined by way of example that a collapsible tube A is to be filled with mobile paste. The tube is placed onto the sleeve 12, whereupon the discharge opening 25 of the pump cylinder 2 registers with the discharge opening 27, whereas the cylinder opening 24 is shut. Primarly, the piston is moved to the left into the position illustrated in Fig. 1, whereupon the valve sleeve 12 is retained open by the lever 11. Thereby paste will be discharged through the spout 1 out of the openings 13 and then forced inwardly and out of the valve opening 28 on forming a central string B of paste. During this filling the tube A is lowered successively. When the several parts have attained the relative positions illustrated in Fig. 1, the return movement (to the right) of the piston 3 is commenced, whereby a minor quantity of paste is sucked into the spout so that a contracted string B of paste will be obtained, which may easily be torn off so that its lower part falls down centrally upon the paste supplied to the tube. This effect may be increased by providing the spout end with the narrow hole 15 through which the pump may suck still a little quantity of paste into the spout.

When the valve sleeve 12 shuts the openings 13 the rack 20 turns the pump cylinder 2 so that the inlet openings 24 and 26 will register whereas the opening 25 is shut and the piston sucks fresh paste into the pump cylinder.

I claim:—

1. In an apparatus for delivering portions of relatively mobile material, a delivery spout having an end forming a valve seat and having lateral discharge openings, a valve sleeve enclosing said spout and having a central narrowed discharge opening, a pump for periodically supplying material to said spout, and a mechanism operatively connecting said pump with said sleeve to shut the lateral discharge openings of said spout by means of said sleeve and substantially simultaneously to impart to said pump a retractive suction movement.

2. In an apparatus for delivering portions of relatively mobile material, a delivery spout having an end forming a valve seat and having lat-

eral discharge openings, a valve sleeve enclosing said spout and having a central narrowed discharge opening, a pump for periodically supplying material to said spout, and a mechanism operatively connecting said pump with said sleeve first to impart to said pump a short retractive suction movement and then to shut the lateral discharge openings of said spout by means of said sleeve.

3. In an apparatus for delivering portions of relatively mobile material, a delivery spout having an end forming a valve seat and having lateral discharge openings and also having a narrow central opening, a valve sleeve enclosing said spout and having a central narrowed discharge opening, a pump for periodically supplying material to said spout, and a mechanism operatively connecting said pump with said sleeve to shut the lateral discharge openings of said spout by means of said sleeve and substantially simultaneously to impart to said pump a retractive suction movement, the central opening in the end of the spout being considerably narrower than the central discharge opening of the sleeve.

4. In an apparatus for delivering portions of relatively mobile material, a delivery spout having an exteriorly tapered discharge end forming a valve seat and having lateral discharge openings and also having a narrow central opening, a valve sleeve enclosing said spout and having an interiorly tapered discharge end and also having a central narrowed discharge opening in said end, a pump for periodically supplying material to said spout, and a mechanism operatively connecting said pump with said sleeve to shut the lateral discharge openings of said spout by means of said sleeve and substantially simultaneously to impart to said pump a retractive suction movement, the central opening in the end of the spout being considerably narrower than the central discharge opening of the sleeve.

5. In an apparatus for delivering portions of relatively mobile material, a delivery spout having an end forming a valve seat and having lateral discharge openings and also having a narrow central opening, a valve sleeve enclosing said spout and having a central narrowed discharge opening, a pump for periodically supplying material to said spout, and a mechanism operatively connecting said pump with said sleeve to shut the lateral discharge openings of said spout by means of said sleeve and substantially simultaneously to impart to said pump a retractive suction movement, the central opening in the end of the spout being considerably narrower than the central discharge opening of the sleeve, the end of the spout projecting out of the discharge end of the sleeve.

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