

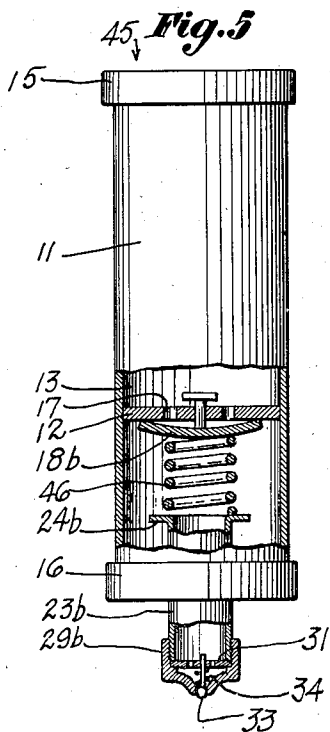
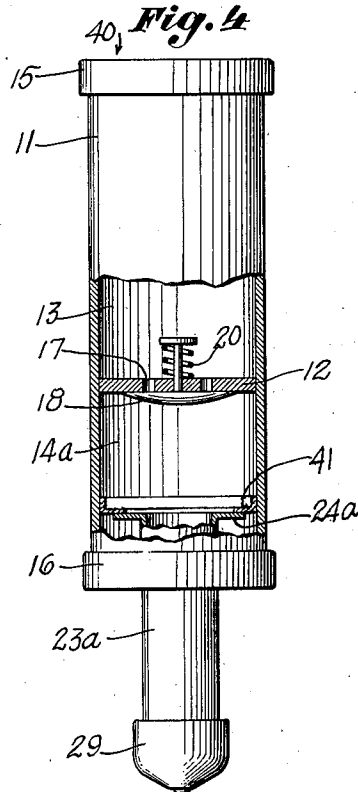
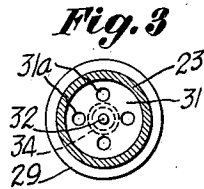
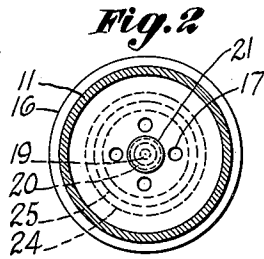
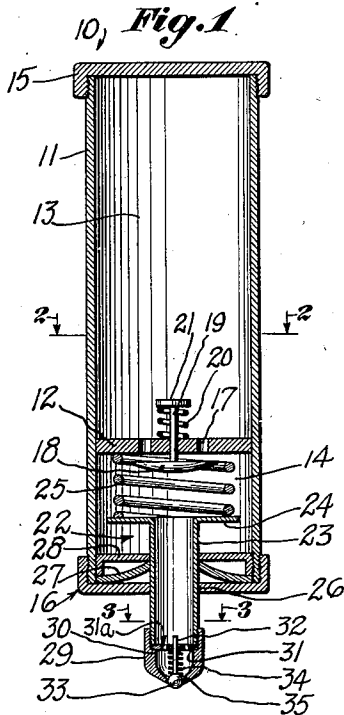
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2,106,046

MARKING IMPLEMENT

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MARKING IMPLEMENT

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This invention relates to devices such as marking implements that utilize a paste in marking or writing upon textiles or other fabrics.

One object of the invention is to provide a device of the character described including a rigid container tube for the paste, serving as a convenient finger grip, and improved means including a piston responsive to normal marking pressure for causing a feed of the paste.

Heretofore marking implements have been provided with collapsible tubes which were subjected to pressure while being held, so as to cause ejection of the paste. Such a tube is constantly diminished in size so that its function as a handle is interfered with, and the operator's hand becomes tired due to maintaining the pressure and the feed of the paste may vary from time to time. It is therefore an object of the invention to overcome these defects.

Another object of the invention is the provision of an improved marking implement comprising a reservoir and a feed chamber having valve intercommunication, and a marking point valve mounted on a piston in the feed chamber, which piston is movable inward in response to writing pressure to cause ejection of paste, and then outward to cause replenishment of paste in the feed chamber from the reservoir chamber, with the valved intercommunication being controlled at least in part by the piston.

A further object of the invention is to furnish a marking implement of the type mentioned having relatively few and simple parts, and which is durable and reliable in construction, inexpensive to manufacture, and convenient and efficient in use.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated in the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a view in longitudinal section showing a device embodying the invention.

Figs. 2 and 3 are sectional views taken respectively on the lines 2—2 and 3—3 of Fig. 1.

Figs. 4 and 5 are fragmentary sectional views showing different modifications of the invention.

The advantages of the invention as here out-

lined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Referring in detail to the drawing, 10 denotes a marking implement embodying the invention. The same may include a rigid tube or container 11 that may have a transverse partition 12 dividing the tube into reservoir and feed chambers 13 and 14 respectively. The former may be closed by a removable screw cap 15, and the latter by a removable piston guiding and packing retaining bushing or cap 16.

The reservoir and feed chambers may have valve intercommunication that may include perforations 17 in the partition 12 and a valve 18 for controlling the same. The valve 18 may be on the feed chamber side of the partition, and is mounted on a stem 19 guidingly movable in a central hole of the partition. An expansion coil spring 20 may act between the partition and an end head 21 of the stem so as to serve to move the valve 18 upward and to thus hold the same in closed position. The valve 18 is here shown depressed, as when feeding of a marking fluid occurs into the feed chamber.

Within the feed chamber is a piston means 22 that may have a feed tube 23 projecting outward of the feed chamber. At the upper end of the feed or piston tube 23, the latter may have an annular flange 24 for seating an expansion coil spring 25 which acts between the flange and the partition 12, and is annularly spaced from the valve 18. As hereinafter indicated, the piston may reside solely in the tube 23 or in flange 24, or in both of these parts, particularly as the piston tube 23 may be valve controlled, and the flange 24 may extend into relative proximity to the cylindrical wall of the container 11.

The piston tube 23 may guidingly extend through a central opening 26 in the packing retaining cap 16. Disposed around the piston tube is a packing ring 27 that wipes against the piston tube. A flanged ring 28 overlies and retains the packing ring and may be threadedly or otherwise secured to the container wall at its flange.

At the lower end of the piston tube 23 there may be secured, threadedly or otherwise, a nozzle

29, that may be shouldered at 30 for clampingly seating a perforated plate 31 between the shoulder 30 and the adjacent end of the piston tube 23. Guided in a central hole of the plate 31 is a stem 32 carrying at its lower end a ball shaped valve 33 which is urged outward by an expansion coil spring 34 that extends around the stem 32 and acts between the plate 31 and the valve 33. The latter is retained in a tubular portion 35 of the nozzle which is inwardly annularly lipped to form a seat so that the valve is thus normally seated in closed position on an annular seat of the nozzle, and projects outward beyond the end of the nozzle in the closed position of the valve 33.

The spring 20 may be extremely delicate and, if desired, may be weaker than the spring 34. The openings 17 may be of sufficient size to permit a free flow of marking fluid from reservoir chamber 13 to the feed chamber 14 without causing undue suction therein by piston action caused by the spring 25, so that a relatively light spring 34 may suffice to keep the valve 33 closed against the entrance of air. Since the valve 18 is substantially larger in size than the marking point valve, the former will respond to a small suction that is wholly insufficient to affect the latter. The perforations 31a in the plate 31 may be of any suitable size.

In use, the operator grasps the container 11 as a writing handle, and in marking upon the fabric, the writing pressure upon the marking point valve causes the same to open inwardly against the force of the spring 34. This pressure is in turn exerted upon the piston tube 23 so that the marking fluid is compressed and fed to the nozzle 30. During this time the valve 18 is held closed by the spring 20. When the marking pressure is momentarily relieved, the spring 25 acts to project the piston tube 23, creating a suction in the feed chamber 14 so as to cause the valve 18 to open, and then paste in the reservoir chamber 13 flows into the feed chamber 14. Hence in the normal use of the invention there is an intermittent ejection of paste from the feed chamber and replenishment of the feed paste therein. Although no air is admitted to the reservoir chamber 13, volatile constituents may be generated from the marking fluid to fill the space evacuated by the latter.

In Fig. 4 is shown a marking implement 40 which is generally similar in construction and operation to the device 10, except that the spring 25 is omitted. Hence a piston tube 23a is used of substantially larger diameter than that of the piston tube 23 for greater compression of the marking fluid or paste per unit of piston travel. For the same reason the member 23a is longer and has a greater path of travel than the member 23, and the feed chamber 14a is correspondingly longer. Preferably the piston flange 24a may have an annular sealing element 41 of metal, leather or other composition to obtain the maximum available piston area. In practice, the device 40 is used until the piston tube has reached the innermost point in its travel, and then the operator grasps the piston tube 23a and pulls outward thereon to exert the suction on the feed chamber 14a for causing opening of the valve 18.

In Fig. 5 is shown a device 45 like the devices 10 and 40, except that an expansion coil spring 46 may act between the valve 18b and the flange 24b. It is noted that the area of the valve 18b is larger than the piston area, which in this case is that of the tube 23b. In operation, the

spring 46 keeps the valve 18b closed, and when writing pressure on the device is relieved, the spring 46 acts outward upon the piston to create suction to which the valve 18b readily responds for opening and permitting a flow of marking paste or other fluid from the reservoir into the feed chamber.

Within the scope of the invention, valves may be used that tend to open automatically, as by gravity, when the device is not in use, but which are closed by the pressure of the marking material while the device is being used in writing. Such action can be obtained by omitting the spring 46, and since the valve 18b has a relatively small throw.

We claim:

1. A marking implement including a casing having rigid walls and being provided with a transverse partition dividing said casing into a reservoir chamber for a marking fluid and a feed chamber for said fluid, valve controlled means intercommunicating said chambers, piston means in the feed chamber, said piston means having a tubular member movable therewith and at one end communicating with the feed chamber and at its other end projecting from the casing, a marking point valve in said projecting end of the tubular member normally closing the same and being mounted so as to be responsive to axial writing or marking pressure to move to open position so as to permit a discharge of the marking fluid under pressure of the piston means, with the valve controlled means being in closed position, an outward movement of the piston means serving to cause movement to open position of the valve controlled means for a flow of the marking fluid from the reservoir to the feed chamber.

2. A device including a marking implement having a rigid handle forming tube divided to provide reservoir and feed chambers, means for controlling the flow of marking fluid between said chambers, a piston in the feed chamber having a tubular portion projecting therefrom, said tubular portion having a marking nozzle and having a marking point valve for controlling the ejection of fluid at the nozzle, said piston being inwardly movable in response to axial marking pressure, with the valve being movable to open position for ejection of marking fluid, and the piston being outwardly movable for causing opening of said means.

3. A device including a marking implement comprising a rigid tube, a transverse partition dividing the same into a reservoir chamber and a feed chamber, said chambers intercommunicating with each other through a port in the partition, a first valve in the feed chamber for closing said port, said first valve being yieldably closed in the normal use of the marking implement, a piston in the feed chamber, said piston having a tubular extension projecting axially outside of the feed chamber, said tubular extension having a marking nozzle at its free outside end, a second normally closed valve in the nozzle, said piston and second valve being responsive to axial pressure in use of the implement so that the piston moves inward and the second valve opens, and said first valve being responsive to suction caused by outward movement of the piston to move to open position.

4. A device according to claim 2, wherein a resilient means is provided for urging the piston for outward movement.

5. A device according to claim 2, wherein the

nozzle provides a seat for the said marking point valve, and the latter is yieldably outwardly urged to engage said seat and project outward of the nozzle in closing position of the said valve.

5 6. A device according to claim 2, wherein the nozzle is provided with an internal seat for the marking point valve, and the said valve engages said seat and projects outward beyond the end of the nozzle in the closed position of the valve, 10 said valve having associated means for resiliently urging the same to closed position, and said means including a second valve whose area is substantially larger than that of the marking point valve so that the second valve can open 15 when the marking point valve is closed, and the marking point valve being responsive to marking pressure to move inward to open position.

7. A device according to claim 3, wherein a resilient means is provided for urging the piston 20 for outward movement.

8. A marking implement including a container having reservoir and feed compartments for a marking fluid, a first closable means for controlling the flow of said fluid from the reservoir 25 to the feed compartment, means for controlling the flow of fluid from the feed compartment, the second means including a piston in the feed compartment comprising a tubular portion projecting from the feed compartment, said tubular 30 portion being valve controlled and having a writing end portion such that the piston is subjected to inward pressure in course of use of the writing end portion to compress the fluid in the feed compartment in the closed position of the 35 first means.

9. A marking implement including a container having reservoir and feed chambers, a first valve to control flow of a marking fluid between the chambers, a second valve to control an outlet for 40 the feed chamber, said valves being alternately

operative so that when one is open the other is closed, and means for causing the alternate operation of the valves including a piston in the feed chamber comprising a tubular writing portion for carrying fluid from the feed chamber to 5 a writing surface and arranged so that the writing action causes the tubular portion to move the piston inward of the feed chamber to exert pressure on the fluid therein.

10. A marking implement including a feed 10 chamber, a piston therein comprising a tubular portion extending outside of the feed chamber, said tubular portion having an outlet end nozzle and a marking point valve therein projecting outside of the nozzle at the orifice thereof, said 15 piston and valve being movable in response to writing pressure to cause a flow of marking fluid through said orifice.

11. A marking implement according to claim 8, including a single spring tending to close the 20 first means and to cause outward movement of the piston.

12. A marking implement including a container having reservoir and feed chambers, a valve controlling the flow of marking fluid from 25 the reservoir to the feed chamber, the container being formed to be adapted to be held in the hand in the manner of a writing implement, the feed chamber having a writing means for feeding and controlling the flow of fluid therefrom 30 to a writing surface, said means including a piston subject to writing pressure in the normal use of the instrument for moving inward of the feed chamber and exerting pressure on the marking fluid therein with the said valve being in 35 closed position, to thus cause said fluid to be fed outward, and said valve being open upon outward movement of said piston.

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