

May 8, 1951

H. HOFFMAN

2,551,676

DISPENSER FOR POWDERED MATERIALS

Filed Feb. 14, 1948

Fig. 2.

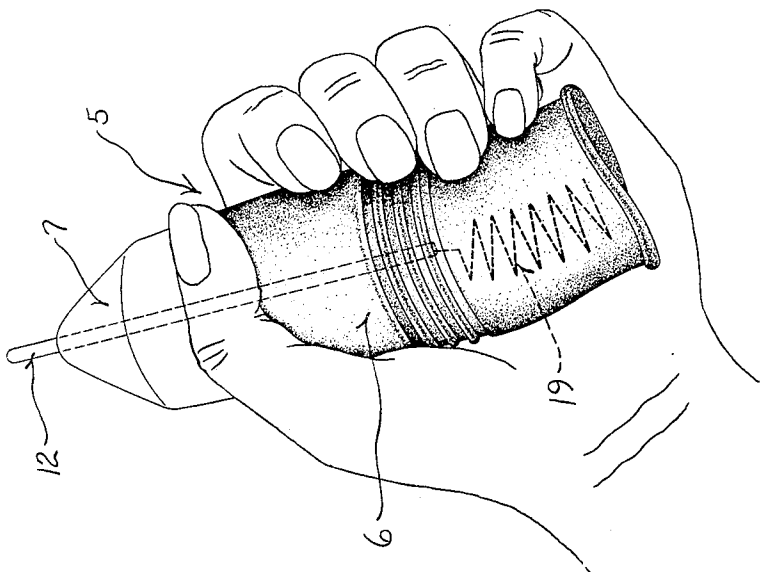
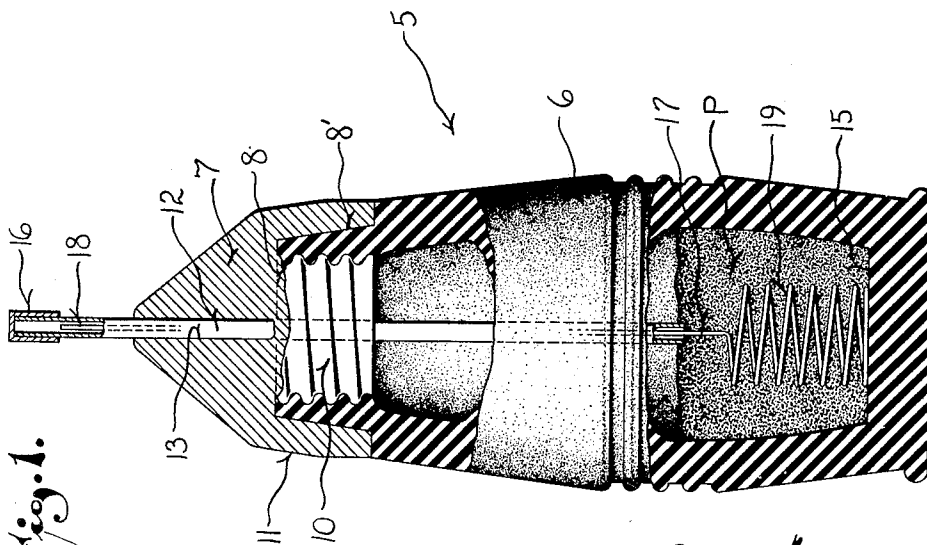


Fig. 1.



Inventor
Harold Hoffman
By Ira Miller Jones
Attorney

UNITED STATES PATENT OFFICE

2,551,676

DISPENSER FOR POWDERED MATERIALS

Harold Hoffman, Chicago, Ill.

Application February 14, 1948, Serial No. 8,427

4 Claims. (Cl. 222-148)

1

This invention relates to dispensing devices and has more particular reference to dispensers for spraying powdered materials such as graphite.

Present types of dispensers for this purpose generally comprise a container having a movable or flexible wall, and are provided with a discharge passage through which powdered graphite in the container is ejected in the form of a spray as the wall of the container is moved or flexed inwardly. Such dispensers are of a size to conveniently fit the hand, and in many instances the container has a bulb-like body formed of rubber or an equivalent elastic material which may be squeezed to effect spray-ejection of the graphite for the lubrication of mechanisms to which access is difficult.

One of the most annoying problems encountered with all dispensers used for the spray-ejection of powdered graphite results from the tendency of the powdered graphite to pack into a more or less solid mass in the dispenser body and to clog the relatively small diameter discharge nozzle which must be used to achieve the proper spray effect. When this occurs, inward flexure of the body walls is incapable of effecting ejection of powdered graphite from the dispenser, and it has always been necessary for one using the dispenser to violently shake the same and even knead the body walls to loosen the graphite and thereby place the same in a condition to be blown from the dispenser by squeezing of the walls of the dispenser body.

Another objection to past types of dispensers for powdered graphite stems from their inability to be operated until completely emptied of powdered graphite, and this, of course, required frequent filling of the body of the dispenser even though considerable powdered graphite may have remained therein. This deficiency results from the necessity of locating the inlet end of the discharge nozzle of the dispenser substantially remote from the supply of powdered material maintained in the dispenser body in an effort to avoid clogging of the nozzle by the graphite.

With these objections to past dispensing devices in mind it is an object of the present invention to provide an improved dispenser for powdered materials which is especially suited for spray-ejecting powdered graphite, and wherein the danger of the material becoming packed within the dispenser body or lodged in the discharge passage of the dispenser is entirely eliminated.

Another object of this invention resides in

2

the provision of a dispensing device of the character described with means operable in consequence to normal handling of the dispenser for precluding packing of the powdered material contained within the body of the dispenser, and for insuring complete emptying of the contents of the dispenser without clogging of the discharge passage through which the powdered materials are ejected.

More specifically it is an object of this invention to provide a dispensing device of the character described with an elongated discharge passage projecting a substantial distance into the interior of the container body, and wherein a wire loosely received in said passage and connected to an agitator inside the dispenser body maintains the powder in loose condition in the body and prevents clogging of the discharge passage in consequence to normal handling of the dispenser.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which: Figure 1 is a side elevational view of a dispenser embodying the principles of this invention, and having portions broken away and shown in section; and

Figure 2 is a view illustrating the manner in which the powdered material in the container body is agitated and loosened in consequence to use of the device so as to prevent the material from packing or becoming clogged in the dispenser.

Referring now more particularly to the accompanying drawing in which like numerals indicate like parts, the numeral 5 generally designates the dispenser of this invention. In the present case the dispenser is shown comprising a container including an elongated hollow body 6 of rubber or any other suitable elastic material, and a detachable metal cap 7 closing the opening 8 at one end of the body. The opening 8 is formed in a reduced neck 9 on the body,

and the wall of the opening has internal screw threads molded thereon.

Projecting from the underside of the cap is an inner nipple-like part 10 having screw threads on its exterior to enable it to be threaded into the opening 3, and an outer annular skirt 11 which closely encircles the neck 8'. The skirt is axially separated from the nipple-like part by an annular recess of a size to snugly receive the neck 8' of the body and thus insure a leak-proof fit between the cap and body.

The hollow interior of the body is adapted to contain a quantity of powdered material P which may be powdered graphite or any other powdered material having a tendency to pack into a nearly solid mass. The material P is adapted to be charged into the interior of the body through the opening 8 upon removal of the cap 7, and is adapted to be discharged as a spray through a relatively small diameter discharge tube 12 carried by the cap 7 and projecting longitudinally therethrough to have its inner end extend a substantial distance into the interior of the body.

In the present case the discharge tube 12 is pressed into an aperture 13 in the cap 7 and is of a length such as to protrude slightly from the exterior of the cap and to have its inlet end inside the body remote from the cap and near the end 15 of the body opposite its open end 8. A suitable closure 16 may be telescoped over the outer end of the discharge tube when the dispenser is not in use to insure against loss of graphite and to guard against the entry of oil vapors and the like into the container.

According to the present invention the discharge tube 12 projects deep enough into the interior of the body 6 so as to enable the entire contents of the body to be emptied during use of the dispenser. In fact, the inner end of the discharge tube may even project into the supply of powdered material contained within the body 6, as suggested in Figure 1, and while such a condition invariably led to clogging of the material in the discharge passage in the past, the present invention provides means in the nature of an agitator 17 for preventing such clogging.

The agitator comprises a relatively stiff length of wire 18 loosely and movably disposed inside the discharge tube 12, and having a length nearly equal to the length of the tube. This wire has a cross sectional dimension so related to the cross section of the tube that the wire does not materially interfere with the passage of powdered material through the tube, and the wire projects from the inner end of the tube into the interior of the body and has convolutions 19 formed thereon. These convolutions lead toward the end 15 of the body from the inner end of the discharge tube, and while the convolutions are freely disposed within the body of the dispenser, they nevertheless limit longitudinal motion of the wire 18 relative to the discharge tube so that the wire is retained in the tube by the convolutions.

Conversely, the wire 18 serves to substantially loosely hold the convolutions in place adjacent to the inner or inlet end of the discharge tube, but it will be seen that the convolutions are free to move laterally as well as longitudinally toward and from the adjacent end of the discharge tube during handling of the dispenser.

The weight of the convolutions alone may be sufficient to insure motion of the same both laterally and longitudinally inside the body during handling of the dispenser, but it will be obvious that the powdered material inside the body, in

shifting about during handling of the body assures that motion will be imparted to the convolutions and through the convolutions to the wire 18 inside the discharge tube.

As seen in Figure 1 the convolutions terminate adjacent to the end of the body toward which the discharge tube projects, and are thus in a position to be shifted about by the act of ejecting powdered material from the dispenser, as for instance, when the flexible or resilient walls of the body are squeezed by the hand of an operator as shown in Figure 2.

During inward flexure of the body walls, therefore, the convolutions are disturbed and translate at least part of such inward flexure of the walls into motion of the wire 18 inside the discharge tube 12 to dislodge any powdered material which may be obstructing the passage. This motion of the convolutions also assures the breaking up and loosening of any powdered material that has tended to pack adjacent to the inner or inlet end of the discharge tube, and thus facilitates the ejection of the powdered material from the dispenser.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art that this invention provides an improved dispensing device for powdered materials such as powdered graphite and wherein clogging or packing of the powdered materials is completely eliminated.

What I claim as my invention is:

1. In a dispenser for powdered materials: a hollow body for the powdered material to be dispensed having a wall inwardly movable to effect ejection of powdered material from the body; a nozzle on the body with its inner end projecting a substantial distance into the hollow interior of the body, said nozzle having a small diameter discharge passage therethrough; a rod-like element in said discharge passage and projecting into the interior of the body, said rod-like element having a diameter sufficiently smaller than that of the discharge passage as to be capable of both lateral and longitudinal motion therein; and weight means loosely disposed within the hollow body so as to be free to move about therein and connected with said rod-like element to impart lateral and longitudinal motion thereto in consequence to such handling of the dispenser as causes the weight means to shift about inside the body.

2. The dispenser set forth in claim 1 wherein said weight means has a dimension lengthwise of the discharge passage less than that of the space between the inner end of the nozzle and the wall of the body opposite the same so as to limit longitudinal motion of the rod-like element in the discharge passage, and said weight means having transverse dimensions less than those of the interior of the body but greater than the dimensions of the inner end of the nozzle so as to maintain the rod-like element in position within the discharge passage of the nozzle.

3. In a dispenser for powdered materials: a hollow body for the powdered material to be dispensed having a wall inwardly movable to effect ejection of powdered material from the body; means on the body defining a discharge passage which is no smaller in diameter at its discharge end than it is at its inlet end and through which powdered material is adapted to be ejected upon inward motion of said body wall; and an agitator for preventing powdered material from clogging said passage and from caking inside the

5

body comprising a piece of wire having a substantially straight portion including one end thereof disposed within the discharge passage and extending into the interior of the body, said wire having a diameter less than the inside dimension of the discharge passage and being loose therein so as to be capable of lateral and longitudinal motion relative to the nozzle, and a coiled portion including the other end of said wire loosely disposed within the interior of the body to move about therein, and by means of which lateral and axial motion is imparted to said straight portion of the wire in the discharge passage in consequence to such handling of the dispenser as disturbs the coiled portion of the agitator.

4. In a dispensing device of the type having a hollow body adapted to contain powdered material to be dispensed and having a wall adapted to be flexed inwardly to effect ejection of powdered material from the body: means on the body defining a discharge passage of small, substantially uniform diameter, through which the powdered material is adapted to be ejected; a helically coiled length of wire loosely disposed inside the hollow body so as to be free to move laterally from side to side therein and lengthwise between the mouth of the discharge passage and the wall of the body opposite the same; and a straight length of wire joined to said coil

6

and extending therefrom into the discharge passage, said straight piece of wire having a diameter smaller than that of the discharge passage and being movable longitudinally and laterally relative to the passage by said coil in consequence to such handling of the dispenser as disturbs the coil, and said straight length of wire limiting motion of the coil produced by inward flexure of said wall of the body so that the coil exerts a churning effect upon the powdered material in the body each time said body wall is flexed inwardly to break up any material which may have packed inside the body.

HAROLD HOFFMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
29,446	Turner	July 31, 1860
300,450	Doremus	June 17, 1884
936,186	Tellerson	Oct. 5, 1909
1,501,806	Peter	July 15, 1924
1,688,372	Barker	Oct. 23, 1928
1,778,291	Burke	Oct. 14, 1930
1,913,618	Sternberg	June 13, 1933
2,017,422	Shonnard	Oct. 15, 1935
2,275,185	Shinn	Mar. 3, 1943