Jan. 26, 1937. W. H. ROSE 2,068,871

POWDER SPRAYING DEVICE

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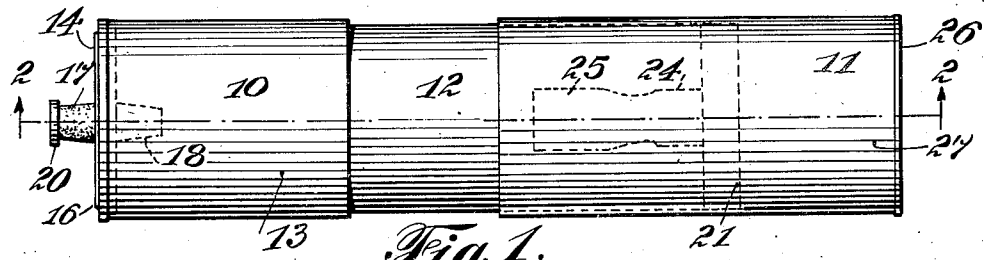


Fig. 1.

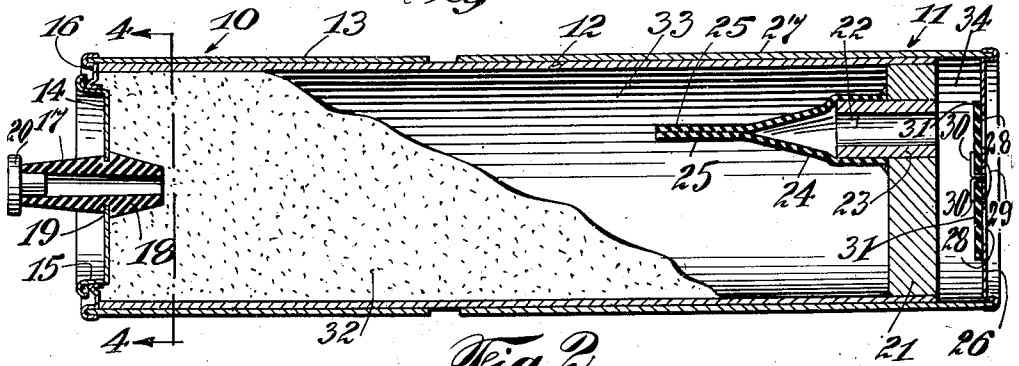


Fig. 2.

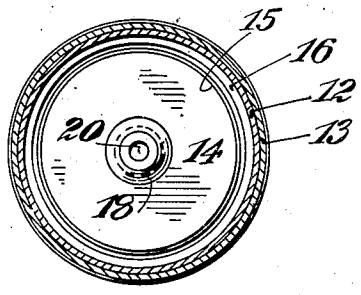


Fig. 4.

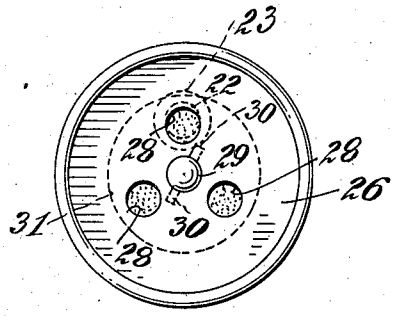


Fig. 3.

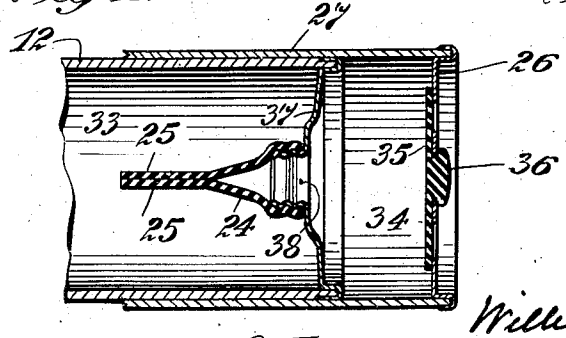


Fig. 5.

INVENTOR.
William H. Rose
BY
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POWDER SPRAYING DEVICE

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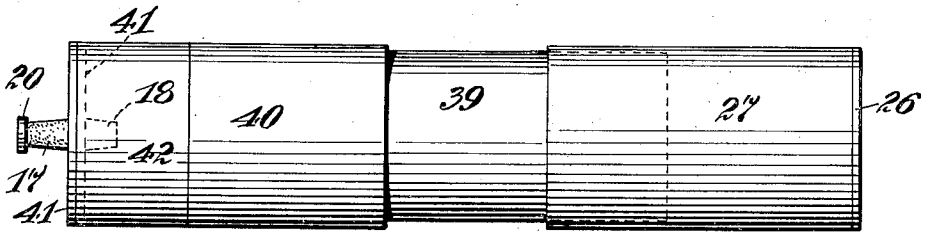


Fig. 6.

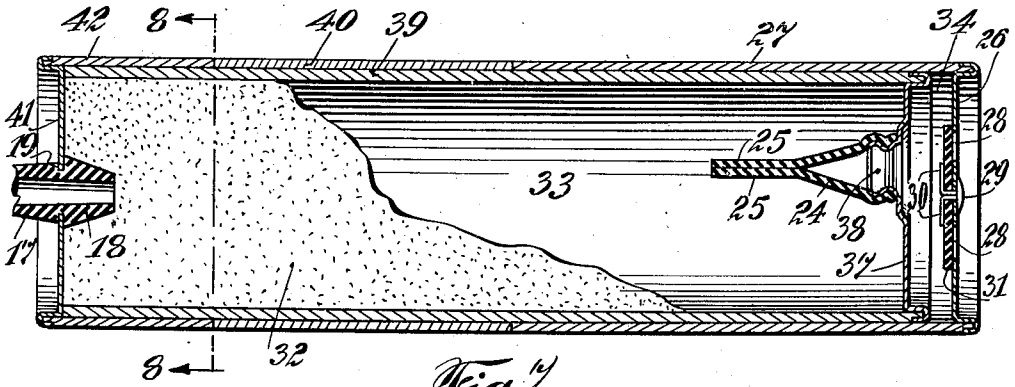


Fig. 7.

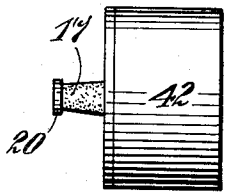


Fig. 9.

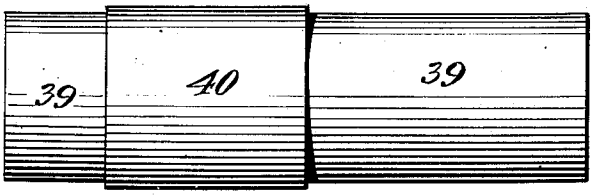


Fig. 10.

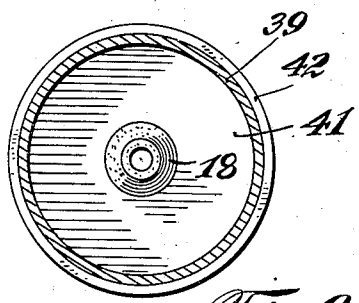


Fig. 8.

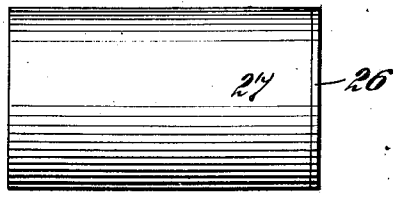


Fig. 11.

INVENTOR.

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Patented Jan. 26, 1937

2,068,871

UNITED STATES PATENT OFFICE

2,068,871

POWDER SPRAYING DEVICE

William H. Rose, Jersey City, N. J., assignor to Stanco Incorporated, a corporation of Delaware

Application November 30, 1934, Serial No. 755,292

3 Claims. (Cl. 43—147)

My invention relates to powder spraying devices and refers particularly to reciprocating piston devices of this character.

Among the undesirable properties of the generally employed powder spraying devices are the high cost of construction, their liability to become dented rendering them inoperative, the back suction of the powder into the air chamber, the clogging of valves preventing the proper operation of the device, the bending of plunger rods, imperfect abutment between the piston and the chamber side, the absence of proper central guidance for the plunger, incomplete exhaustion of the powder from the powder chamber and the ejection of a more or less column of powder instead of a desirable spray effect, none of which undesirable properties are possessed by the device of my invention.

The novelty and advantageous features of my device will be evident from a consideration of the accompanying drawings illustrating modified forms of the device of my invention, and in which similar parts are designated by similar numerals.

Figure 1 is a plan view of one form of the device of my invention with the two tubular members in partial withdrawn positions.

Figure 2 is an enlarged vertical cross section of the device of Figure 1, with the two tubular members in nearer approach to each other.

Figure 3 is a right end view of Figure 2.

Figure 4 is a section through the line 4—4 of Figure 2.

Figure 5 is a broken vertical cross section of a modified form of my device.

Figure 6 is a plan view of a modified form of my device in partially withdrawn positions of the elements.

Figure 7 is an enlarged vertical cross section of the device shown in Figure 6, in closed position.

Figure 8 is a section through the line 8—8 of Figure 7.

Figures 9, 10, and 11 are plan views of the three tubular members of the device of Figure 6 shown in disengagement.

The particular form of my device shown in Figures 1, 2, 3, and 4 consists of two tubular telescopic members 10 and 11.

The inner tubular member 10 preferably of cardboard consists of the side wall 12, to which is adhesively attached an outer side wall, or stop member 13, preferably of cardboard of less length than the side wall 12.

An outer end closure member for the tubular member 10 consists of the base member 14, and the extended flange side 15, preferably of metal, the upper extremity of which is turned outwardly.

A curved annular friction joint member 16 is extended over the upper edges of the walls 12, and 13, the inner element of the joint member being capable of abutment against the outer face of the flange 15 to form a tight-fitting friction retention therewith.

The base member 14 has a centrally positioned opening, preferably of an outwardly restricted frustrated cone formation.

A hollow spout passing through the opening in the base member 14, preferably of rubber, or other suitable material, consists of a hollow tube having a side wall, the outer portion 17 of which decreases outwardly in thickness, and the inner portion 18 of which decreases inwardly in thickness, the spout having the shoulder 19. In assembling the device, the spout, if of resilient material, can be forced through the opening, producing a tight jointure and the shoulder 19 preventing the outer disengagement of the spout due to any pressure exerted against it during the operation of the device.

I employ a removable plug 20 to prevent the escape of powder from within the device when it is not in use.

The inner end of the tubular member 10 is closed by means of an annular closure member 21 of wood having an opening 22, therein, through which there extends a tubular member 23, the outer edge of which is preferably flush with the outer face of the closure element 21.

Fixedly attached to the outer face of the tubular member 23 is an annular rubber, or other resilient, valve 24, the inwardly extended portion of which is constructed into two abutting lips 25, 25 which normally close this end of the valve.

The outer tubular member, or plunger 11, preferably of cardboard, is open at its inward end, the outer end being closed by a closure member 26, preferably of metal, the peripheral edge of which is bent over to abut upon the outer extremity of the side wall 27. This closure member has a plurality of holes 28, 28, 28, and a central small opening, through the latter of which a headed cotter-pin 29 extends, the legs 30, 30 of which maintains a flap valve 31, preferably of rubber against the inner face of the closure 26, said valve covering the openings 28, 28, 28.

The tubular member 11 is telescopic over the outside of the wall 12 of the tubular member 10, and is of such size and shape with respect to the other elements of the device that when the walls 13 and 27 abut, the closure member 21 does not abut upon the flap valve 31, thus preventing the

latter from being injured when the device is in use.

The operation of the device is as follows:—

The closure 14 is removed, powder 32 introduced therethrough into the powder chamber 33, and the closure 14 replaced, and the plug 20 removed.

As the tubular member 11 is moved outwardly, air passes through the openings 28, 28, 28, of the closure 26 into the air chamber 34, the suction of the air being induced by the partial vacuum in the chamber 34 formed during this outward movement of the member 11. This outward movement also causes a perfect closure of the valve members 25, 25 thus preventing the suction of powder from the powder chamber 33 into the air chamber 34.

When the tubular member 27 is moved inwardly, the flap valve 31 abuts upon the closure 26 closing the openings 28, 28, 28 and preventing the escape of air therethrough.

The air is thus forced through the valve 24, 25, 25 into the powder chamber 33, and a mixture of air and powder being forcibly ejected through the spout 17, 18 in the form of a fine spray or mist.

A repetition of this reciprocating movement of the tubular member 11 thus causes a plurality of such powder and air emissions.

Figure 5 illustrates a modified form of my device in which the flap valve consists of a sheet of rubber 35 having an extended knob, or head, 36 which is passed through the opening in the closure 26 of the tubular member 11. In this modified form, the inner closure member for the tubular member 10 consists of a metal member 37 having an inwardly striated, or threaded, tubular member 38, the valve 24 of the valve fitting tightly around and abutting upon the outer face of the tubular member 38.

The modified form of my device illustrated in Figures 6 to 11, consists of an inner tubular member 39, to which is attached the annular stop member 40. The outer end of the tubular member is closed by means of an annular cap-shaped device having the closure member 41 and the fixedly attached annular flange member 42. The flange member 42 is telescopically movable over the outer face of the inner tubular member 39 and is frictionally held in place thereon. The other elements of this modified form are similar to those previously described.

Among the advantages of this last described construction over those of the form of my device previously described is the increased facility for filling as the entire opening in the inner tube is exposed when this closure cap is removed for this purpose, the greatly decreased cost of production due to the smaller number of parts and their greater ease of assembling, and the greater ease of opening the device which do not require an instrument for this purpose, whereas in the first described form an instrument of some kind is required to remove the closure member 14.

It will thus be seen that my device is economic in construction, not liable to become dented, back suction of powder into the air chamber is prevented, the valves can not become clogged, there are no plunger rods to become bent, there is a perfect abutment between the two tubular members, there is no necessity of a proper guiding member of the two tubular members, one of which serves as a plunger, the powder can be completely emitted from the device and the powder is emitted in the form of a fine spray.

A noticeable feature of my device is the large powder containing chamber compared with the length of the entire device, for it will be seen that this chamber is practically as long as the device itself.

While a handle may be attached to the end of the outer tubular member if desired, it is not necessary as in actual use the inner tubular member is grasped by one hand and the outer tubular member by the other hand, thus producing a much more regular and positive movement than can be accomplished by an extended handle. It is also evident that the omission of a handle greatly reduces the packing space of the device.

The small number of parts in the construction of my device greatly reduces the cost of production and minimizes the danger of its becoming inoperative.

While I have referred in my specification to cardboard and metallic elements in certain elements of my described devices, I do not limit myself to these, as any suitable materials may be employed.

The device may be other than circular in cross-section, and it may be water-proofed or otherwise treated if desired.

I wish to be understood, therefore, that I do not limit myself to the particular size, shape, number, arrangement or material of the parts of my device as specifically mentioned, as these are given simply in order to clearly describe the device of my invention.

What I claim is:—

1. In a powder dispensing device consisting of a tubular container having a closure at each end, a dispensing closure for one end consisting of a narrow annular member affixed at its outer edge to the end of the container and affording frictional engagement at its inner edge for a separable cap having an opening therein adapted to receive a resilient spout having inner and outer portions each formed in the shape of a frustum of a cone, with their bases opposed and separated by an annular groove intermediate the length of the spout, the incidence of the side walls to the base of the inner frustum being greater than that of the outer frustum whereby the base of the inner frustum protrudes beyond that of the outer one to reinforce the resistance of the spout to outward displacement, and a passageway through the spout of uniform diameter throughout its length closed at its outer end by a friction fitted plug.

2. In a powder dispensing device consisting of a tubular container having a closure for each end, a dispensing closure for one end consisting of a metallic cap having an outwardly extending peripheral flange adapted to rigidly engage the edges of the container, a circular opening in the cap, a resilient spout having an annular groove at an intermediate point thereon adapted to receive the edge of the opening in the cap, the side walls of the spout sloping away from the groove and toward the ends to form inner and outer frusto-conical end portions, of which the inner portion has a base of greater diameter than that of the outer portion whereby resistance of the spout to outward displacement is reinforced, and a passageway through the spout of uniform diameter throughout its length closed at its outer end by a friction fitted plug.

3. In a powder dispensing device consisting of a tubular container having an inner and an outer end, a dispensing cap on the outer end and a valved cap at the inner end, and an outer tubular casing for the container capable of telescopic

movement over said container, a closure for one end of the casing, consisting of a cap having an outwardly extending peripheral flange adapted to rigidly engage the end of the casing, a plurality of openings in the cap including one disposed centrally thereof, and a disc shaped resilient member held against the inner surface of the cap and covering the openings therein by means of a knob on the member grooved annularly at its junction with the disc shaped member to engage the edges of the central opening in the cap.

WILLIAM H. ROSE.