

Sept. 24, 1940.

W. L. RUTKOWSKI

2,215,937

COMBINED POWDER CONTAINER PACKAGE AND SPRAY GUN

Filed May 26, 1939

2 Sheets-Sheet 1

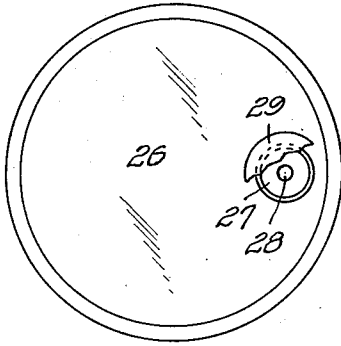


Fig. 1.

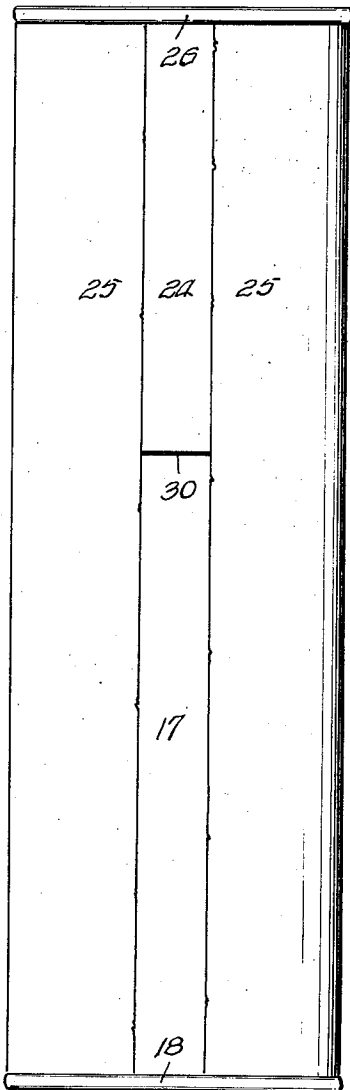


Fig. 2.

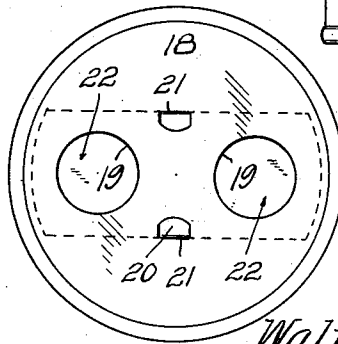


Fig. 4.

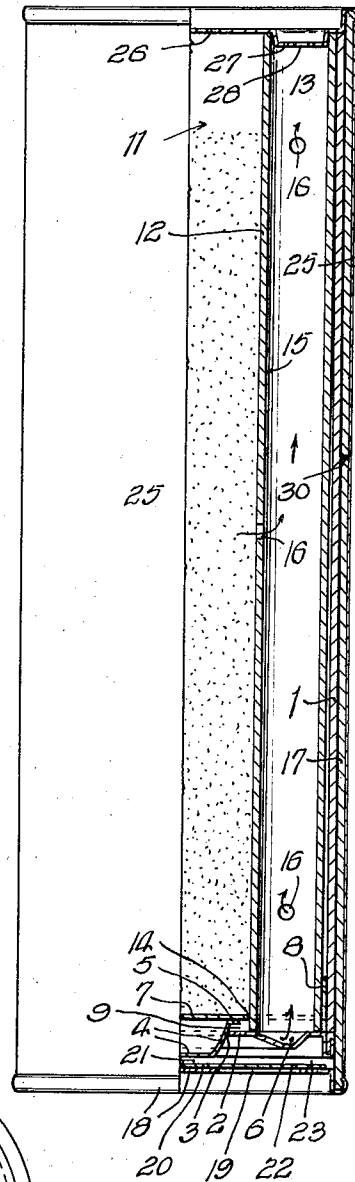


Fig. 3.

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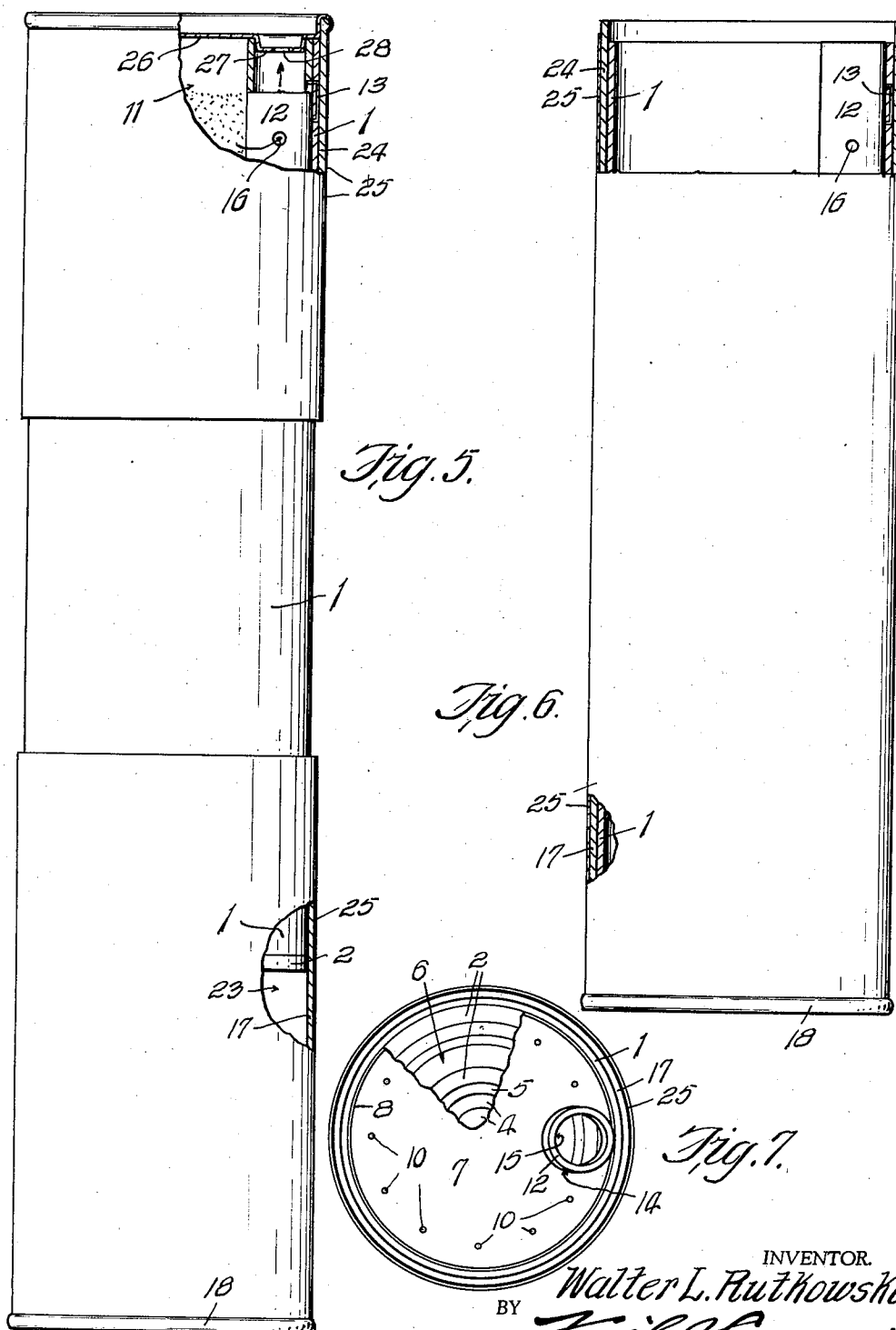
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UNITED STATES PATENT OFFICE

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COMBINED POWDER CONTAINER PACKAGE
AND SPRAY GUNWalter L. Rutkowski, Normandy, Mo., assignor to
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tion of Missouri

Application May 26, 1939, Serial No. 275,960

4 Claims. (Cl. 43—147)

This invention relates to a combined powder container package and spray gun, and, it is a continuation, in part, of my present application Serial Number 219,872, filed July 18, 1938.

5 An object of my invention is to deliver a greater volume of air, from within a compressed air distributing chamber, into one end of a by-pass than is delivered into the inner end of a powder storage and distributing chamber, and, from
10 which powder storage and distributing chamber, an air and powder mixture is delivered into the by-pass, at spaced points along its length, to be discharged from the outer, or other end of the pass together with air passing completely through
15 the length of the by-pass.

A further object of the invention is the provision of a unitary powder container package and spraying device, which will materially eliminate packing and clogging of the powder in the container when of an oily content, and, cause the
20 powder to be properly mixed with the right amount of air during its discharge from the container, so that an excessive quantity of powder will not be discharged during spraying operations, thereby greatly increasing the efficiency
25 of a device of the character for spraying powdered insecticides.

A further object of the invention is the provision of a container package for powdered insecticides, which will be simple and comparatively
30 inexpensive in construction, which after purchase thereof can be immediately used as a spray gun for applying the insecticide directly from the package into a room, as well as remote and inaccessible places within the room, by a simple
35 pumping action of one of the elements of the container package.

A still further object of the invention is the provision of a container package of the character, which is assembled and labeled, with the
40 exception of crimping one end closure head to the container package, at its place of manufacture, so as to allow a full tube opening at one end of the device for filling one tube of the container package construction with a powdered
45 insecticide, at a place remote from the can manufacturer, and, which end closure head is applied by the insecticide packer after the container package has been filled with powdered insecticide,
50 thus relieving the packer of labeling the package after the container has been filled, which is a very desirable feature.

With the above and other objects in view, the invention consists in the novel features of construction, arrangement and combination of parts

hereinafter more fully described and finally pointed out in the claims hereto appended.

Referring to the accompanying drawings forming a part of this specification, wherein like characters of reference denote similar parts:

Fig. 1 is a top plan view of my combined powder container package and spray gun.

Fig. 2 is a side elevation of the combined powder container package and spray gun and showing part of the label therefor as broken away.

Fig. 3 is a view partly in side elevation and partly in section of a combined powder container package and spray gun embodying the features of my invention.

Fig. 4 is a bottom plan view of the combined powder container package and spray gun.

Fig. 5 is a side elevation of the combined powder container package and spray gun, with the label severed, and showing telescopic parts thereof in extended relation.

Fig. 6 is a side elevation of the container package, completely assembled with label, but without the top end closure head, as the container appears before being filled with powder.

Fig. 7 is a top plan of the container package with the top end closure head removed, and showing the inner perforated head of the inner tube partly broken away.

Briefly, and by reference to the drawings, it will be observed that the combined powder container package and spray gun includes the following essentials, namely, a container tube serving as a storage and distributing chamber for a powdered insecticide; a compressed air distributing chamber in the lower end of the container tube, which is provided with an air control valve on one side, and, having a plurality of air outlets on the other side leading into the powder storage and distributing chamber; a by-pass tube in the storage and distributing chamber having end communications with the air distributing chamber and an air and powder spray discharge opening in a metal end closure for the storage and distributing chamber, the by-pass tube having wall openings for air and powder transfer from the storage and distributing chamber into the by-pass tube, a valve equipped slide tube mounted on a major portion of the container tube and serving as a sleeve piston to provide an air compression chamber between the inner end of the container tube and the outer end of the slide tube, and a hand grip tube mounted on and secured to the remaining portion of the container tube.

The essentials above described, when combined in a package assembly, constitute a spray

gun so that the powder contents of the container tube can be conveniently sprayed from a discharge opening by merely working, or moving the sleeve piston away from, and toward the inner valve equipped end of the container tube, and by such an assembly of parts obviate the necessity of having to transfer powder from a package to an independent spray gun.

The container package consists of a suitable, so-called, paper or card-board tube 1 of the usual well known construction, which is cut to the desired length, and normally open at both ends.

A sheet metal closure head 2 is crimped at its peripheral edge to the lower edge of the container tube 1, in the usual manner, so as to engage and protect the inner, end and outer faces of the tube 1, thus providing an inwardly dished closure head. The closure head 2 is provided with a central opening 3 serving as an air inlet. The opening 3 is normally closed by means of a metal cap shaped valve member 4, which projects downwardly through the opening 3. The valve member 4 is provided at its upper edge with an outstanding flange 5, serving as a stop, or means for centralizing the valve with relation to the opening 3 so that there will be provided an air inlet space around the valve, between the valve and the edge of the opening 3 when the valve is raised by air pressure, as will be more clearly apparent hereinafter.

The sheet metal closure head 2 is formed or shaped to provide an annular air distributing channel 6 by pressing an annular portion of the head material beyond the opening 3 downwardly, as clearly shown in Fig. 3.

An inner bottom closure head, or partition 7, preferably of card-board or paper material and provided with an upwardly projecting wall flange 8, is positioned and suitably secured in position such, as by adhesive, within the tube, or body 1. The inner closure head 7 is suitably spaced from the outer metal bottom closure head 2 to provide a suitable air distributing chamber 9 therebetween. The auxiliary, or inner paper bottom closure head 7 is preferably, but not necessarily, provided a suitable distance from its edge, with a series of spaced small air outlet openings 10 communicating with the interior of the tubular body 1, which serves as a powder storage and distributing chamber 11. It will be here observed that there is sufficient flexible resilient movement of the auxiliary paper head 7 adapted to act against the valve flange 5 to urge and hold the valve member 4 closed until air under pressure lifts the valve 4 to allow the air to pass through the valve controlled air inlet opening 3 and into the air distributing chamber 9.

A suitable by-pass tube 12, preferably of card-board or paper material, and constituting a conduit, can, if desired, be suitably secured in position near its upper end, such as by a staple 13, to the inner wall of the container tube 1, as clearly shown in Figs. 5 and 6. However, the staple 13 need not necessarily be employed, as noted in Fig. 2. The lower end of the air tube 12 passes downwardly through an opening 14 in the auxiliary bottom paper closure head 7 and rests on the inner face of the metal bottom closure head 2 so as to span the annular air channel 6. This arrangement permits air compressed within the air distributing chamber 9 to follow the annular air channel 6 for free entrance into the lower end of the tube 12 seated on the metal closure head 2. The upper end of the tube 12 projects upwardly a slight distance beyond the upper edge

of the container tube 1, as shown in Fig. 2. The tube 12 serves to provide a by-pass 15 for an air and powder mixture, thus serving a dual purpose, as hereinafter more fully described. The tube 12 is of such inside diameter as to have a capacity much greater than the quantity of air that can possibly be forced from the distributing chamber 9 through the openings 10 in the closure head or partition 7 and into the powder storage and distributing chamber 11. The tube or conduit 12 is provided along its length with a plurality of suitably spaced powder and air inlet openings 16 for the purpose of allowing a mixture of powder and air within the powder storage and distributing chamber 11 to be restrictively transferred into the by-pass 15 for final mixture with air in the tube 12 for discharge therefrom in the form of an efficient spray.

A suitable length of slidable paper tubing 17 has outer telescoping connection with a major portion of the length of the container tube 1. The inner or upper end of the slide tube 17 is open, as is manifest, and the outer or lower end of the slide tube 17 is closed by means of a sheet metal closure head 18, which is crimped at its peripheral edge to the lower end of the slide tube 17, in the usual crimping manner, so as to protect the inner end and outer face portions of the lower end of the tube 1, and thereby provide an inwardly sunken head portion. The closure head 18 is provided with a pair of spaced relatively large air inlet openings 19 that are normally closed by means of a paper strip 20 suitably secured midway its ends to the inner face of the metal closure head 18 by means of a pair of prongs 21 punched from the closure head material. The prongs 21 are forced through the paper strip 20 and clinched to hold the paper strip in position over the air inlet openings 19.

The paper strip 20 is stiff enough so that the free ends 22 thereof serve as valve members to normally close the air inlet openings 19, yet flexible and resilient enough to efficiently function as valves for opening and closing the air inlet openings 19.

For instance, when the slide tube 17 is operated as a sleeve piston, and moved outwardly along the container tube 1, air rushes through the openings 19 in the closure head 18 and into the air compression chamber 23 formed between the metal closure heads 2 and 18. When the slide tube 17 is moved inwardly on the container tube 1, air that has been admitted to the chamber 23 is compressed, closing the air inlet openings 19 by means of the valve members 22, and the air is then forced under pressure into the air distributing chamber 9 through the valve controlled opening 3 in the metal closure head 2 on the lower end of the container tube 1. From the air distributing chamber 9, some of the air is forced through the air outlet openings 10 in the paper closure head 7 into the powder storage chamber of the container tube 1, and, at the same time a greater amount of air is forced by way of the annular closure head channel 6 into the lower end of and through the by-pass tube 12, which tube 12 serves also as an air and powder mixing chamber, as well as an air by-pass, as the powder and air in the storage and distributing chamber 11 finds its way through the tube openings 16 into the by-pass tube 12.

To complete the powder container and spray gun structure, a short open ended tube 24 is slipped onto and surrounds the upper end portion of the container tube 1, and, it is of such length as to complete the outer tube structure

of the container package and spray gun. The inner edge of the tube 24 is adapted to meet the inner edge of the slide tube 17 and when so assembled, the tube 24 is adhesively secured to the container tube 1 so that it cannot be displaced. The tube 24 also serves as a hand grip for the package when used as a spray gun, as it is held in one hand while the slide tube is moved back and forth by the other hand.

After the parts thus far described have been assembled, a label 25 is affixed to the slide tube and hand grip tube, thus holding them against separation, until the label is severed along a line opposite the unconnected joint between the inner edges of the slide tube and the hand grip tube.

The package is now ready to be filled with powder from the open top end of the container tube 1, which is possible due to the fact that the upper or outer end of the hand grip tube is also open.

After the container tube 1 has been properly filled with powder, the final operation of completing the combined powder container and spray gun structure is carried out, which is the closing of the upper open end of the hand grip tube 24.

The upper end of the hand grip tube 24 is closed by means of a metal closure head 26, which is crimped, in the usual manner, by means of a crimping machine. The peripheral edge of the closure head 26 is crimped to the upper edge of the hand grip tube in such a manner as to protect the inner, end and outer face portions of the upper end of the tube 24. The closure head 26 is provided near the edge thereof with a depressed portion to form an inwardly projecting circular boss 27 having an outer diameter equal to the inner diameter of the apertured by-pass tube 12, so that when the closure head 26 is applied to the hand grip tube, the boss will be seated within the upper end of the tube 24 and with the upper end face of the tube 24 in tight contact with the inner face of the metal closure head 26 to provide a leak-proof joint therebetween.

The depressed boss on the closure head 26 is provided with a suitable central discharge opening 28, which is in axial alignment with the tube 12 so that the air and powder mixture in the tube 12 will be discharged from the tube 12 through the single opening 28 in the form of an efficient spray. The opening 28 in the boss 27 is sealed by means of a paper sticker 29 after the container tube 1 has been filled with powder.

When the closure head 18 on tube 17 is moved toward the closure head 2 on the tube 1, air in the chamber therebetween is compressed, closing the air inlet openings 19 by means of the valve members 22, and, the air is then forced under pressure into the air distributing chamber 9. From here, some of the compressed air passes through the air outlet openings 10 in the powder storage and distributing chamber 9, and at the same time a larger amount of air is forced by way of the channel 6 into and through the by-pass tube 12, which serves also as a mixing chamber, as well as an air by-pass, as the powder and air in the storage and distributing chamber of tube 1 finds its way through the by-pass tube openings into the air by-pass 12 to be discharged as an air and powder mixture in the form of a spray through the single discharge 28 in the closure head 26. The air introduced under pressure into the powder storage and distributing chamber of tube 1 through the small openings 10 in the partition, or head 7, is just sufficient to cause the

proper quantity of powder in the storage chamber to be carried through the by-pass tube wall openings into the by-pass tube 12 to keep a steady stream of powder in the form of a spray being discharged through opening 28 from the by-pass tube 12. The by-pass tube 12 provides more air, under pressure, from the air distributing chamber, for final mixing purpose, than is introduced into the powder storage and distributing chamber of tube 1 from the air distributing chamber through openings 10 so as to prevent powder from packing in the by-pass tube 12 and to set up a steady powder spray when the package is operated as a spray gun. When the tube 1 is completely full of powder, the by-pass tube 12 will supply the required amount of air for mixture with the powder entering the by-pass tube through the by-pass tube wall openings to cause the powder to be efficiently sprayed therefrom through the discharge opening 28 in the closure head 26 after the sticker seal over the opening has been punctured. When the container tube 1 is not full of powder, the air entering the powder storage and distributing chamber of the tube 1, serves to carry powder into the by-pass tube 12 through the tube wall openings.

The hand grip tube and the slide tube or sleeve piston are sealed together to prevent their separation by means of the label 25, which label must be severed at the joint 30 formed between the inner ends of said tubes, as will be apparent from Fig. 1, before the container package can be used as a spray gun.

The many advantages of the herein described invention will readily suggest themselves to those skilled in the art to which it appertains.

From the foregoing description, it is evident that a simple device for this purpose has been disclosed, but it is to be understood that I do not desire to restrict, or limit myself to the very details of construction shown and described, which is merely illustrative, it being obvious that changes, not involving the exercise of invention, may be made without conflicting or departing from the spirit of the invention within the scope of the appended claims.

What I claim is:

1. A combined powder container and spray gun having, in combination, a powder storage and distributing chamber, an air distributing chamber having communication with the powder storage and distributing chamber through a series of small openings, an air conduit having a discharge orifice at one end thereof disposed in the powder storage and distributing chamber and projecting at its other end into the air distributing chamber, and the powder storage and distributing chamber communicating with the air conduit through a plurality of air and powder outlets to allow a mixture of air and powder to be forced into the air conduit for mixture with an amount of air direct from the air distributing chamber for final discharge through the aforesaid discharge orifice in the form of an air and powder spray.

2. A powder container tube for a combined powder container package and spray gun having, in combination, a paper tube forming a powder storage chamber, a closure head crimped to the lower end of the tube, a valve for closing an air opening in the closure head, an annular channel formed upon the inner face of the closure head surrounding the opening in the closure head, an inner closure head spaced from the first mentioned closure head to provide an air

distributing chamber, said inner closure head having a series of small openings through which air passes into the powder storage chamber, a conduit within the powder storage chamber and having openings in the wall thereof for the passage of air and powder from the powder storage chamber into the conduit, one end of the conduit passing through an opening in the inner closure head into the air distributing chamber, a short tube surrounding and secured to the upper end portion of the paper tube against displacement thereon, a sheet metal closure head secured to the upper end of said short tube for closing the upper ends of both of said tubes, and an inwardly projecting boss having an air and powder discharge opening formed on said metal closure and receivable in the upper end of the conduit.

3. A combined powder package and spray gun having, in combination, a tube providing a powder storage chamber and an air distributing chamber spaced from one end of the storage chamber, the air distributing chamber having air communication with the storage chamber, the air distributing chamber having an air inlet control, an air by-pass tube within the storage chamber and having wall openings connecting the storage chamber with the interior of the air by-pass tube and projecting at one end into the air distributing chamber, a hand grip tube secured to a portion of the tube providing the storage chamber, a tube provided at one end with

a valve equipped head slidably mounted on the remaining portion of the tube providing the powder storage chamber, a label secured to the hand grip tube and the slidably mounted tube to hold them against separation until severed at the open joint between the inner ends of said tubes, a sheet metal closure head adapted to be crimped to the outer edge of the hand grip tube after the tube providing a storage chamber has been filled with an insecticide powder, an inwardly projecting boss formed from the sheet metal closure head receivable in the outer end of the air by-pass tube, and said boss having an opening through which air and powder finally mixed in the air by-pass tube is adapted to be discharged in the form of a spray.

4. A combined powder container and spray gun having, in combination, a powder storage compartment, an air distributing chamber, a centrally located valve controlled opening in the bottom wall of the air distributing chamber, an air conduit projecting at its inner end into the air distributing chamber and having a recessed outer end provided with a discharge aperture adjacent the outer end of the storage compartment, the air conduit serving as a mixing chamber for powder entering said chamber through openings in the wall of the air conduit, and an inlet valve controlled air compression chamber below the air distributing chamber.

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