June 28, 1938. W. L. RUTKOWSKI 2,122,230

COMBINED POWDER CONTAINER PACKAGE AND SPRAY GUN

Filed March 15, 1937 2 Sheets-Sheet 1

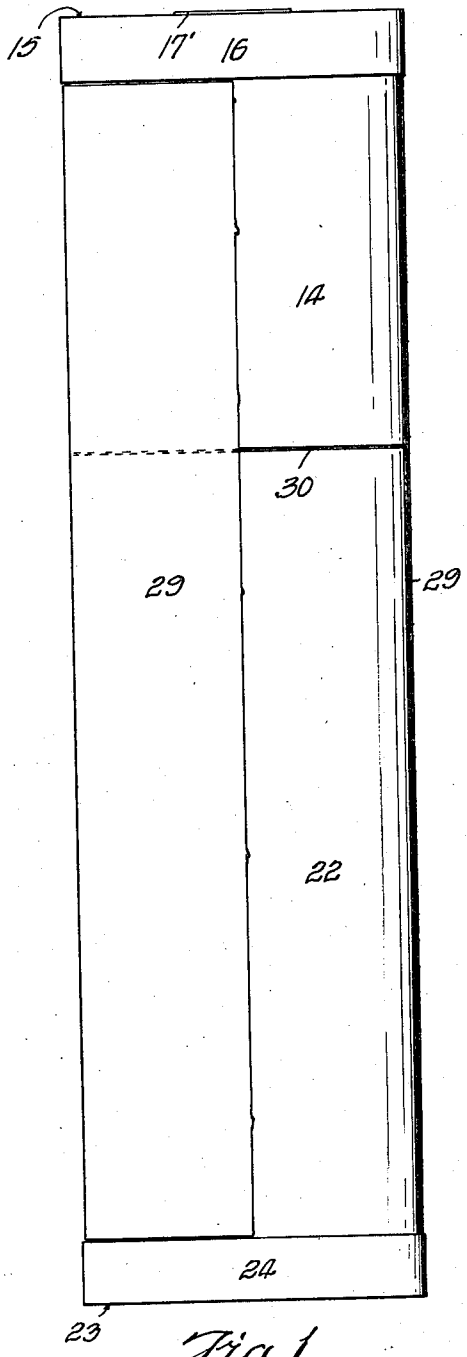


Fig. 1.

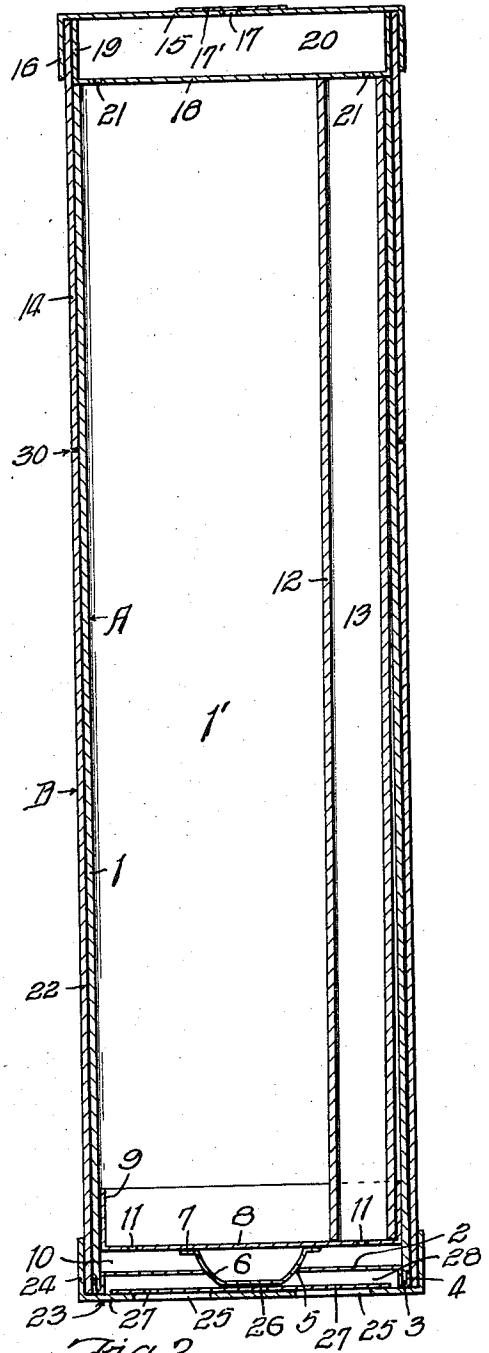


Fig. 2.

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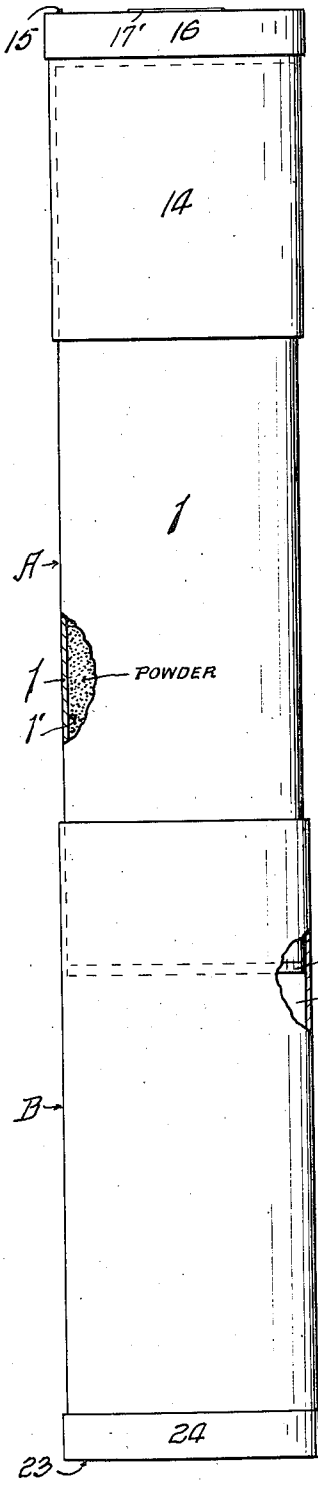


Fig. 3.

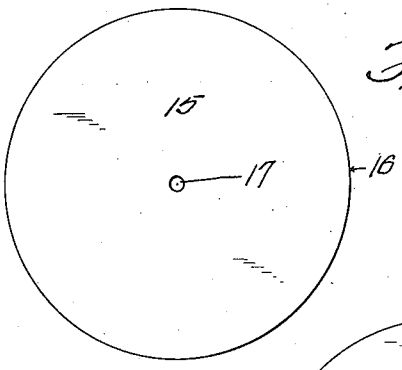


Fig. 4.

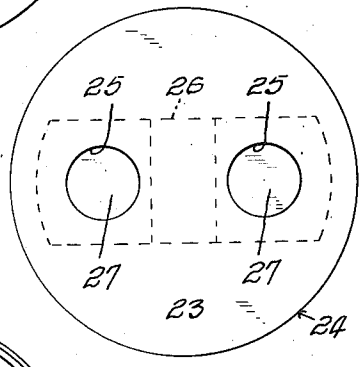


Fig. 5.

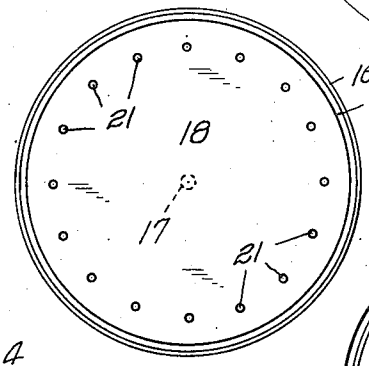


Fig. 6.

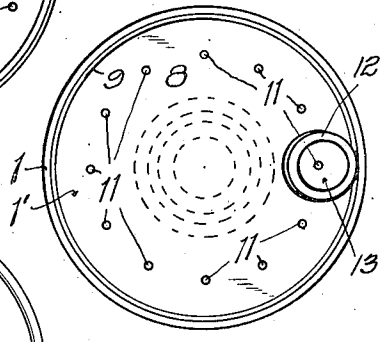


Fig. 7.

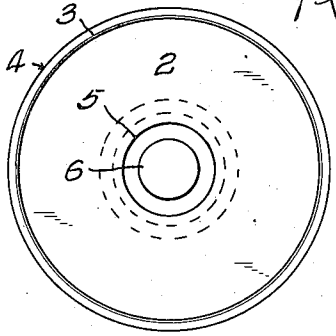


Fig. 8.

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Patented June 28, 1938 2,122,230

UNITED STATES PATENT OFFICE

2,122,230

COMBINED POWDER CONTAINER PACKAGE AND SPRAY-GUN

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Application March 15, 1937, Serial No. 130,826

5 Claims. (Cl. 43—147)

This invention relates to a combined powder container package and spray-gun.

The invention has for its object to improve the efficiency of the powder spray package described in my copending application Serial Number 105,075.

A further object of the invention is to provide a package which consists of a container so constructed as to form a powder chamber, an air compression chamber, an air distributing chamber, a powder and air mixing chamber having a discharge opening in direct and indirect connection with the air distributing chamber, and means for compressing air and delivering compressed air to the air distributing chamber, powder chamber and mixing chamber to force powder from the mixing chamber in the form of a spray.

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 throughout the several views:

Fig. 1 is a side elevation of the powder package.

Fig. 2 is a longitudinal sectional view of the package embodying the features of my invention.

Fig. 3 is a side elevation of the combined container and spray-gun in an extended position.

Fig. 4 is a top plan view of the invention.

Fig. 5 is a bottom plan view of the invention.

Fig. 6 is a bottom plan view of an upper portion of the container package removed from the powder container proper and clearly showing the apertured inner closure head thereof.

Fig. 7 is a top plan view of the powder containing tube showing the inner bottom closure therefor and the by-pass tube within the powder container tube.

Fig. 8 is a bottom plan view of the powder container proper showing the valve controlled air inlet.

In carrying out the invention, I employ a suitable paper container designated, generally as A, which constitutes a holder for a dry powdered insecticide to be sprayed directly from the container, thus obviating the necessity of one having to transfer the contents of the container to a separate and independent spray-gun.

Associated, or co-operating with the container A, is a tubular paper member designated, generally, as B, which member serves as a cylinder with which the container A has telescopic connection so that the container and cylinder, when combined, constitute a spray-gun so that the contents of the container A can be conveniently sprayed by merely working, or moving the container and cylinder away from, and toward each other longitudinally.

The container proper and designated, generally as A, consists of a tubular paper body 1, normally open at both ends. The lower end of the body 1 is closed by means of a suitable sheet metal closure head 2, of the sunken type, having a flange 3 crimped into the outer wall of the tube 1, as at 4, so as not to project beyond the outer wall of the tube 1.

The sheet metal closure head 2 is provided with a suitable central opening, serving as an air inlet 5. The opening 5 is normally closed by means of a suitable cup-shaped valve member 6, which projects downwardly through the opening 5, but, the lower plane of the valve member does not project beyond the lower edge of the tube or body 1. The valve member 6 is provided at its upper end with an outstanding flange 7 so that the valve member 6 will not fall out of the opening 5.

An auxiliary, or inner bottom closure 8, made of paper material, and provided with an upwardly projecting wall flange 9, is positioned and suitably secured in position such, as by adhesive, within the tube, or body 1, and suitably spaced adjacent the metal bottom closure head 2 to provide a suitable air distributing chamber 10 therebetween. The auxiliary, or inner paper bottom closure head 8 is provided a suitable distance from its edge, with a circular ring of small spaced air inlet openings 11 connecting, or communicating with the interior of the tube, or body 1, which serves as a chamber 1' to contain powdered ingredients to be sprayed therefrom. It will be observed that there is sufficient flexible resilient movement of the auxiliary paper head 8 to hold the valve member 6 closed until air under pressure is forced through the valve, or air inlet opening 5 into the air distributing chamber 10.

A suitable paper tube 12 constituting an air conduit is suitably secured, such as by adhesive, to the inner wall of the tube or body 1, and, it extends from the paper auxiliary bottom closure head 8 to a point flush with the upper edge of the tube, or body 1. The air tube 12 sets over one or more of the air inlet openings 11 and serves as a by-pass 13 for compressed air, as will be hereinafter described.

The structure just described is adapted to be filled through the open top thereof with a dry

powdered insecticide, and, thereafter, closed at its upper end to complete the container structure proper.

The means for closing the upper open end of the tube, or body 1, consists of a relatively short paper slip tube 14, which is provided at its upper end with a top closure head 15 having a downwardly projecting wall flange 16 that is slipped over the top end of the tube 1 and suitably secured in position such, for instance, as by adhesive, between the closure head flange 16 and the outer wall of the tube 14. The head 15 is provided with a suitable, preferably, although not necessarily, central discharge or spray opening 17, normally closed by a suitable sticker 17', which can be readily punctured.

A suitable inner closure head 18 formed of paper material, and, having an upwardly projecting wall flange 19, is positioned within the upper end of the tube 14 and suitably spaced adjacent the top closure head 15 so as to provide a suitable mixing chamber 20. The auxiliary closure head 18 is secured in position such, for instance as by suitable adhesive. The auxiliary closure head 18 is provided a suitable distance from the edge thereof with a circular ring of small powder and air outlet openings 21, which openings connect the interior or powder chamber 1' of the tube, or body 1 with the mixing chamber 20. This latter structure slips over the upper end of the container tube 1, and, the tube 14 is secured in position such, for instance, as by a suitable adhesive to seal the tubes 1 and 14 together to prevent powder leakage therebetween.

To complete the package structure, I employ a suitable paper slide tube 22 having telescopic connection with the lower end of the powder container tube 1, and whose diameter is the same as the tube 14. When in its closed position, the upper edge of the slide tube 22 is adjacent the lower edge of the tube 14. The upper end of the slide tube 22 is open, as is manifest, and the lower end thereof is closed by means of a paper closure head 23 having a wall flange 24 adhesively secured to the outer wall of the slide tube 22. The closure head 23 is provided with a pair of spaced relatively large air inlet openings 25 and they are normally closed by means of a paper strip 26, adhesively united midway its ends to the inner wall of the bottom closure head 23. The paper valve strip 26 is stiff enough so that the free ends 27 thereof serve as valve members to normally close the air inlet openings 25, but flexible and resilient so as to function under air pressure. For instance, when the tube 22 is pulled away from the lower end of the container tube 1, air rushes through the openings 25 past the valve members 27 and into the air compression chamber 28 formed between the heads 2 and 23, and, when the tube 22 is moved or slid toward the tube 1, the air in the chamber 28 is compressed, closing the air openings 25 by means of the valve members 27, and, the air is then forced under pressure into the air distributing chamber 10, from where it passes through the air inlet openings 11 into the powder chamber 1', and also through the by-pass 13 into the mixing chamber 20 to be discharged with a mixture of powder in the form of a spray through the single discharge 17 in the top container closure head 15. The air under pressure within the container chamber 1' causes sufficient powder therein to be carried through the outlet openings 21 into the mixing chamber 20 to keep a steady stream of powder in the form of a spray being discharged from the package. The by-pass 13 permits sufficient air, under pressure, to enter the mixing chamber 20 from the distributing chamber 10, especially when the container chamber 1' is full of powder to create a steady powder spray when the container is moved into such a position as to permit powder to pass through the outlet openings 21 in the auxiliary head 18 and when the air forced into the powder chamber cannot penetrate through the mass of powder therein. Of course, if the powder chamber is not packed full to the top, air will find its way through chamber 1' and carry powder therewith through the openings 21 into the mixing chamber 20 to be discharged therefrom in the form of a spray, but, where the tube 1 is completely full of powder the by-pass 13 will supply sufficient air to the mixing chamber 20 to cause the powder to be sprayed therefrom through the discharge opening 17 in the paper head 15 after the sticker seal from the opening has been punctured.

The tubes 14 and 22 are sealed together to prevent their separation by means of a label 29, which label must be severed at the joint 30 formed between the inner ends of the tubes 14 and 22, as will be apparent from Fig. 1.

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. In a package for powdered goods to be discharged therefrom in the form of a spray, having, in combination, a chamber for powdered goods, an air distributing chamber below the powder chamber and provided with an inlet valve, an air compression chamber below the air distributing chamber and provided with valve controlled air inlet openings, means for enlarging and decreasing the area of the air compression chamber, air inlets between the air distributing chamber and the powder chamber, an air and powder mixing chamber above the powder chamber, powder and air inlets connecting the mixing chamber with the powder chamber, a compressed air conduit connecting the air distributing chamber with the powder and air mixing chamber, and the upper end of the powder and air mixing chamber having a spray discharge opening.

2. In a merchandising package of the class described, a container forming a powder chamber, an air chamber having valve controlled air inlet, a mixing chamber having a single spray outlet, a series of small air inlets connecting the air chamber with the powder chamber, a series of small powder and air outlets connecting the powder chamber with the mixing chamber, a conduit connecting the air chamber directly with the mixing chamber, a cylinder having telescopic connection with the container, a closure head at one end of the cylinder and valve controlled air inlets in said closure head.

3. A combined container and spray-gun for powdered insecticides comprising a tubular paper body having a chamber for the powdered insecticide, a top closure head for the body having a

spray discharge opening therein initially sealed with material that can be punctured, a metal bottom closure head for the body, a powder and air mixing chamber formed above the powder chamber and communicating with the powder chamber through a series of small openings, an air distributing chamber formed below the powder chamber and communicating with the powder chamber through a series of small openings, a normally closed air inlet valve in the metal closure head, an air compression chamber formed below the air distributing chamber, a pair of air inlet valves for the air compression chamber, and a compressed air by-pass connecting the air distributing chamber with the powder and air mixing chambers.

4. A combined container and spray-gun for insect powder comprising a tubular paper container body for the powder, a paper top closure for the body having a discharge opening therein initially sealed with material that can be punctured, a metal bottom closure for the body, said body having a final mixing chamber at its upper end communicating through a series of small openings with the powder chamber, said body having an air chamber at the lower end communicating through a series of small openings with the powder chamber, a normally closed valve in the metal bottom closure, a cylinder open at one end and provided with a paper closure head at its opposite end, said cylinder being in telescopic connection with the container body, a pair of valve controlled air inlets in said paper closure head, and a conduit connecting the aforesaid air chamber with the mixing chamber for by-passing air from the air chamber to the mixing chamber.

5. In combination, a tubular container having end closure heads, a cylinder having telescopic connection with one end of the container, said container having apertured auxiliary end heads spaced from the end closure heads to provide a powder chamber between the auxiliary heads, an air chamber between one auxiliary end head and its respective end closure head and a mixing chamber between the other auxiliary end head and its respective end closure head, which latter end closure head is provided with a discharge opening, an air conduit connecting the air chamber directly with the mixing chamber, said air chamber having a valve controlled air inlet, said cylinder having a closure head at one end thereof, and said head having a pair of valve controlled air inlet openings to admit air into a chamber formed between the air chamber of the container and the head of the cylinder when the cylinder is moved away from one end of the container and to force the air in said chamber into the air chamber of the container and simultaneously therewith into and through the powder chamber to the mixing chamber and also through the air conduit into the mixing chamber when the cylinder is moved in the opposite direction for discharging powder from the mixing chamber in the form of a spray.

WALTER L. RUTKOWSKI.