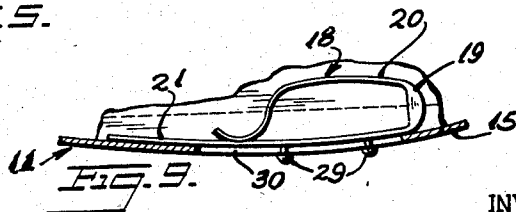
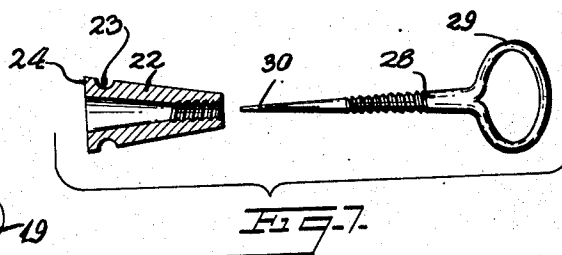
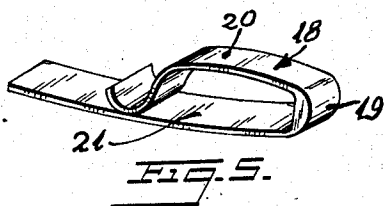
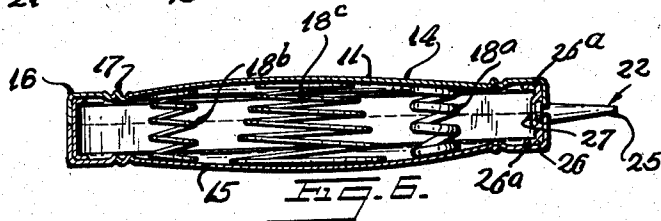
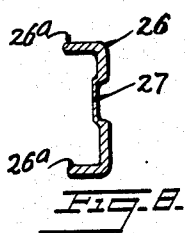
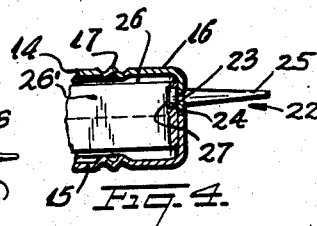
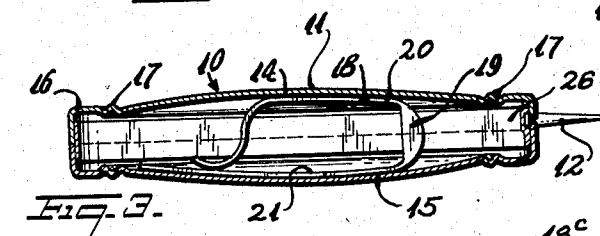
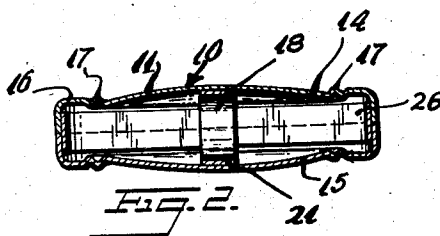
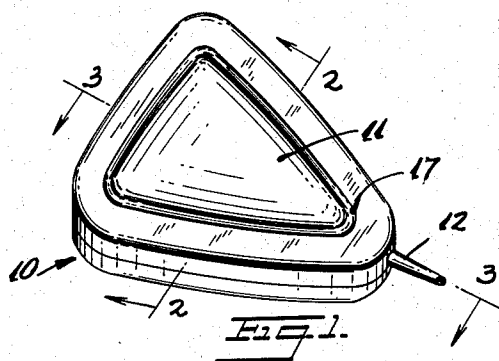


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INSECT POWDER SPRAYER
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UNITED STATES PATENT OFFICE

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INSECT POWDER SPRAYER

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12 Claims. (Cl. 43-146)

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This invention relates in general to a container and in particular to a combination powder box and powder sprayer.

In the use of various powders such as, for example, insect powders, talcum or other dusting powders and the like, it is frequently desirable to provide a convenient method to spray out the powder in the form of a fine cloud of dust. In this way it is possible to obtain the full value of a finely divided powder, since in the fine cloud each minute particle is substantially separated from each other particle. A maximum covering effect may thus be obtained from a minimum of material; in addition, the powder may be blown into ordinarily inaccessible places.

It is an object of this invention to provide a power sprayer which is adapted to eject powder in the form of a fine cloud.

It is a further object of this invention to provide a powder box and powder sprayer in combination, whereby a powder may be stored and then ejected, when used, in the form of a fine cloud.

It is another object of the invention to provide a powder box and sprayer which is adapted to contain a powder in a sealed condition before use and is adapted to eject the powder in the form of a fine cloud when used.

Further objects of the invention as well as its construction, use and operation will in part be obvious and will in part be set forth in the following disclosure.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a combination powder box and sprayer according to one form of the invention.

Fig. 2 is a front cross section of the article shown in Fig. 1, taken along the line 2-2.

Fig. 3 is a side cross section of the article shown in the previous figures, taken along the line 3-3 of Fig. 1.

Fig. 4 is an enlarged fragmentary side cross section of the article shown in the previous figures, showing the constructions and mounting of the spraying nozzle.

Fig. 5 is a perspective view of a U-shaped spring according to one form of the invention.

Fig. 6 is a side cross section of the article, sim-

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ilar to the view in Fig. 3, showing a further form of the invention.

Fig. 7 is an exploded side elevation, partially in section, showing a nozzle and puncturing needle according to a still further form of the invention.

Fig. 8 is a fragmentary enlarged detailed view of the backing member.

Fig. 9 is a fragmentary sectional view similar to Fig. 3, showing a modified form of the invention.

Referring to the figures in detail, there is shown a powder box, generally designated 10, comprising in general a box 11 and a spraying nozzle 12. The box 11 has flexible side walls, and preferably is somewhat pointed, with the nozzle substantially at the apex of the point and slightly above the cross sectional center line of the box.

Referring to Figs. 2 and 3, there is shown the structural detail of the box 10. The box is roughly triangular in shape, having rounded corners, and having a relatively curved top 14 and bottom 15. The edges of the box 16 are curved, and adjacent thereto are small folds or creases 17. Both the curved edges and the creases are flexible, whereby flexibility is imparted to the entire box structure. Thus, the top and bottom of the box may be squeezed substantially together without interference from the edges.

Mounted within the box, and preferably toward the center thereof is a spring 18, comprising a bent strip of spring steel or the like, and having a thickened portion 19 toward the front end of the box. As shown in the figure, the spring (refer also to Fig. 5) is bent to provide an upper leaf 20 and a lower leaf 21 substantially parallel with the top and bottom of the box, and having a curved section 19 joining the leaves springably together. The open end of the upper leaf is bent down to meet the lower leaf, whereby there is imparted to the spring a fine resiliency.

Mounted in the front end of the box, substantially at the apex of the triangular shape of the box is a spraying nozzle 22. A neck 23, near the base 24 of the nozzle is adapted to fit into the box and to be retained therein, leaving the base inside the box and the mouth or body 25 of the nozzle 22 protruding from the box 11. The base 24, being wider than the neck 23, securely anchors the nozzle in position in the box.

A backing member 26 (see also Fig. 8) is mounted within the box bearing against the base 24 of the nozzle, and serves partially to retain the nozzle in its position, and to prevent the nozzle from being forced within the box. This backing

member 26 is a metal strip, bent at the ends forming flanges 26^a to fit the inner contour of the box, and to extend slightly back from the front end of the box along the top and bottom of the box. Slightly above the center of the backing member 26 is a thin indented section 27 which is adapted to receive the base of the nozzle 22. At least this central section 27 is constructed of a soft, puncturable material, such as, for example, a soft metal.

The backing member is fitted within the front of the box, adjacent to the nozzle, and optionally is secured there by means of the snug fit between the backing member 26 and the box 11; alternatively, added means such as, for example, rivets, screws, glue or the like (means not shown in the drawings) secure the backing member firmly to the box.

According to another form of the invention (refer to Figs. 2, 3 and 4) the backing member comprises a flat metallic ring 26; roughly triangular in shape to fit around the inside of the edge of the box 11. This form of the ring, likewise has an indented section to receive the base 24 of the nozzle 22, the indented section being thin and puncturable, as in the case of the backing member shown in Fig. 8.

In the use of the article shown in the drawings, the box 11 is partially filled with a powder, for example, an insect powder, and the box closed and sealed. Optionally, this procedure is carried out in the factory, and the sealed, partially filled box is sold as such, alternatively a door or the like (not shown) in the box is opened to fill the box, and thereafter closed. The sealed box is then opened, for example, by puncturing the backing member 26 at the thin puncturable section 27 directly behind the nozzle. This may readily be done by forcing a needle through the mouth of the nozzle.

The powder is then sprayed, by rapidly forcing together the top and bottom of the box. Because of the relatively stiffer front portion of the spring (combined with the separating effect of the front backing member shown in Fig. 8), the rear end of the box compresses more easily, and therefore the gust of air starting from the rear of the box passes through the nozzle, carrying therewith a portion of the powder contained in the box. The turbulence inside the box and in the nozzle insures that the powder will be thoroughly dispersed in the air, thereby utilizing fully the fineness of the powder.

The fact that the gust of air starts at the rear of the box and passes out the nozzle at the front of the box adds insurance that the gust of air will be turbulent, not merely pass freely out the nozzle. Likewise, it insures that the air will pass for a relatively long distance over the surface of the powder, so that the surface will be thoroughly stirred up. Similarly, the location of the nozzle slightly above the center of the box insures that the powder will not cover the nozzle, so that it is certain that the powder will be carried out in a gust of air, not merely forced through the nozzle by the pressure behind it. Accordingly, every provision is made to cause thorough dispersion of the fine powder particles.

When one puff of powder-air mixture is expelled from the box, the compressing pressure on the box is released, and the spring expands drawing in another puff of air. This new air in turn passes to the rear of the box, again stirring up the powder, so that the next succeeding expulsion of air will have an even more thorough dispersion of

air in case the powder was somewhat caked in the box.

It is noted that the triangular shape of this box has an unobvious advantage. Because of its shape, it is possible for the box to be inserted deep within a corner. Likewise, the narrow triangular shape, wherein the front angle is less than 90° which is shown in the figures and is the preferred form of the invention, permits the box to be inserted in a corner even where a short nozzle is used to prevent the nozzle from being broken off. Likewise, this construction is highly satisfactory for ejecting powder into the smallest cracks and crevices.

It is also to be noted that the construction of the present invention is such that it may not be refilled at any time with a substitute or with a powder of inferior quality.

In Fig. 6 there is shown a different arrangement of parts within the box 11. In this form of the invention, the nozzle 22 is similarly mounted within the front of the box, by means of a backing member 26. The sides of the box are flexible, as in the preceding figures. Toward the front of the box, and inside the box is mounted a relatively heavy spring 18^a, and toward the rear of the box is a lighter spring 18^b, each urging the top 14 and the bottom 15 of the box apart. In this form of the invention, the easy compressibility of the rear of the box is emphasized. In this case, not only is the air carried from the rear of the box, but additionally the backing member 26 is protected from damage because the front section of the box is compressed only slightly, and accordingly only a slight bending of this backing member takes place. Similarly, there is practically no tendency to cause the nozzle 22 to become separated from the box by means of bending of the front portion.

In Fig. 7 is shown a nozzle and puncturing means which is adapted to be used in any of the forms of the invention. In this form, the inside of the nozzle 22 is at least partially threaded, to receive a pin 28 which also is at least partially threaded. A wide or wing handle 29 on the pin serves as a gripping means. In use, the pin is initially loosely screwed into the nozzle with the point 30 of the pin either free from the backing member 26 of the box, or at most only barely touching the backing member. To open the box, this pin is screwed into the nozzle until the backing member is punctured. The pin is then removed, and the powder sprayed out as desired. To reclose the box, the pin is once again screwed into the nozzle, effectively closing the opening.

In Fig. 9 there is shown means for adjusting the compressibility of the box, and in particular of the front and rear sections of the box. In this form of the invention the spring 18 is slidably mounted within the box 11, and its position there-within is controlled by means of knobs 29 projecting slightly outside the box through a slot 30 in the bottom 15 of the box. When the spring is slid forward, the rear of the box is more easily compressed, and when slid back, the rear is more difficultly compressed. Thus there is provided a compressibility control on the box.

It is to be understood that various features of the box have been presented separately, but that some or all of these features may be combined with one another. For example, the slidable spring shown in Fig. 9 and the puncturing pin shown in Fig. 7 may obviously combine in one form of the invention. Other similar combinations likewise are possible.

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While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A powder box having a relatively flat top and bottom and having a nozzle mounted along one edge thereof, a spring mounted within the box to urge the top and bottom apart, and a backing means mounted behind the nozzle to retain the nozzle in its position with respect to the box.

2. A combination powder box and powder sprayer comprising a box having a nozzle mounted along one edge thereof, a spring mounted within the box to urge the top and bottom apart, and a backing means mounted behind the nozzle to retain the nozzle in its position with respect to the box.

3. A combination powder box and powder sprayer comprising a triangular box having a nozzle mounted along one edge thereof, a spring mounted within the box to urge the top and bottom apart, and a backing means mounted behind the nozzle to retain the nozzle in its position with respect to the box.

4. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having rounded corners, a nozzle mounted at one of said corners, a spring mounted within the box to urge the top and bottom apart, and a puncturable backing means mounted within the box and supporting the nozzle on the box, the backing means closing off the nozzle and adapted to be opened by being punctured.

5. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having rounded corners, a nozzle mounted at a corner of the box having an angle of less than 90°, a spring mounted within the box to urge the top and bottom apart, and a puncturable backing means mounted within the box and supporting the nozzle on the box, the backing means closing off the nozzle and adapted to be opened by being punctured.

6. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners, a puncturable backing means supporting said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box.

7. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners, a puncturable backing means supporting said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box, said spring exerting a greater repelling force between the top and bottom at the end of the box nearest the nozzle.

8. A combination powder box and powder sprayer comprising a triangular box having a rel-

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atively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners and above the center of the box, a puncturable backing means supporting said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box.

9. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners and above the center of the box, a puncturable backing means supporting said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box, said spring exerting a greater repelling force between the top and bottom of the box at the end of the box nearest the nozzle.

10. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners and above the center of the box, a puncturable backing means supporting said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box, said spring exerting a greater repelling force between the top and bottom of the box at the end of the box nearest the nozzle, and said backing means having flanges retaining the bottom and top of the box apart adjacent to the nozzle.

11. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners and above the center of the box, a puncturable backing means supporting said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box, said spring exerting a greater repelling force between the top and bottom of the box at the end of the box nearest the nozzle, and means for moving said spring within the box to adjust its position with respect to the bottom and the top of the box.

12. A combination powder box and powder sprayer comprising a triangular box having a relatively flat top and bottom and having flexible rounded edges and corners, a nozzle mounted at one of said corners and above the center of the box, a puncturable backing means supported against said nozzle on the box and closing the opening in the nozzle, and a spring mounted within the box and urging apart the top and bottom of the box, said spring exerting a greater repelling force between the top and bottom of the box at the end of the box nearest the nozzle, and means mounted on the nozzle for puncturing said puncturable backing means.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
742,634	Hall	Oct. 27, 1903
1,388,293	Novotney	Aug. 23, 1921
1,438,487	Greene	Dec. 12, 1922