March 23, 1965 L. WEBER, JR 3,174,693

GUN FOR SPRAYING POWDER OR FIBROUS MATERIAL

Filed Feb. 2, 1961 2 Sheets-Sheet 1

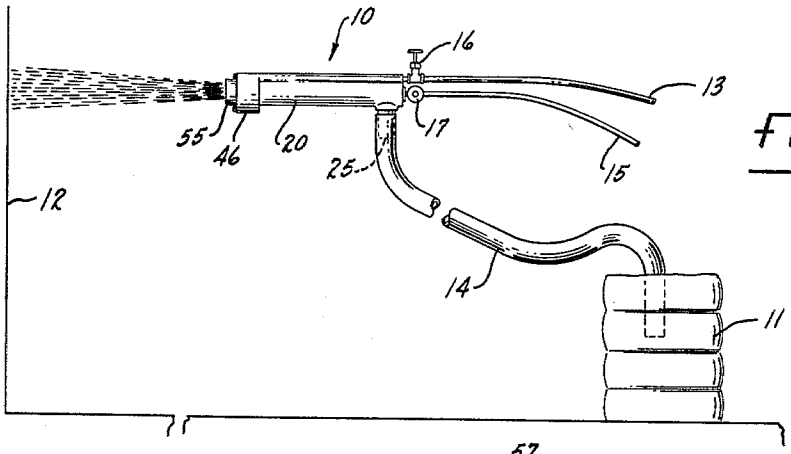


Fig. 1.

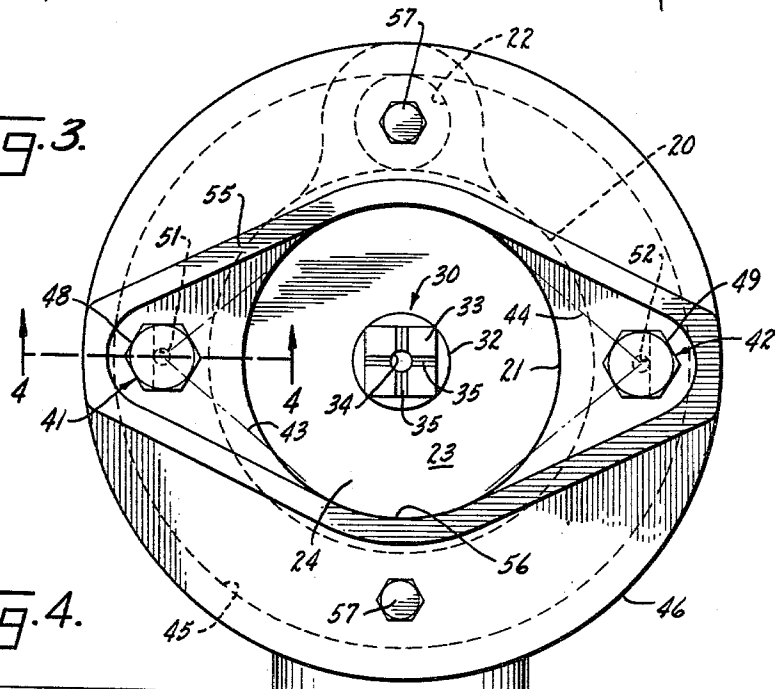
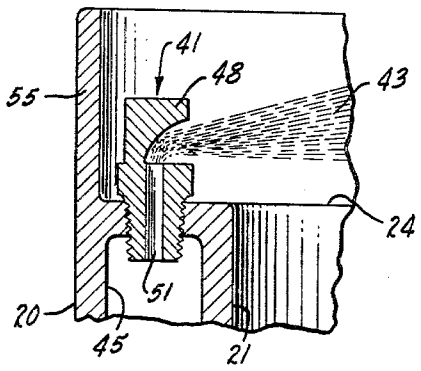


Fig. 3.

Fig. 4.



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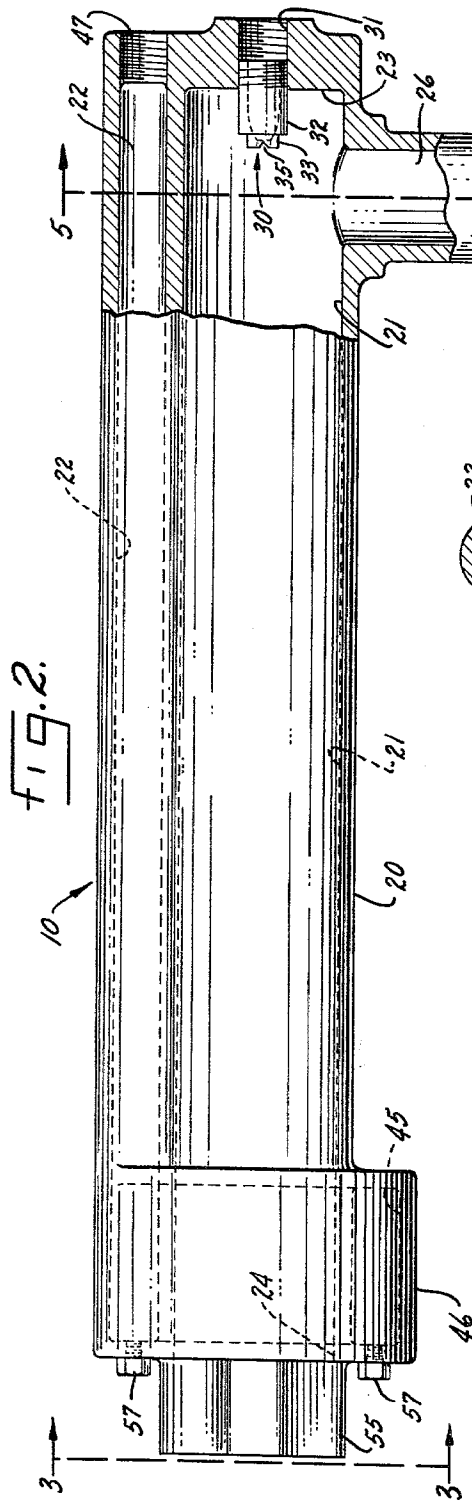


FIG. 2.

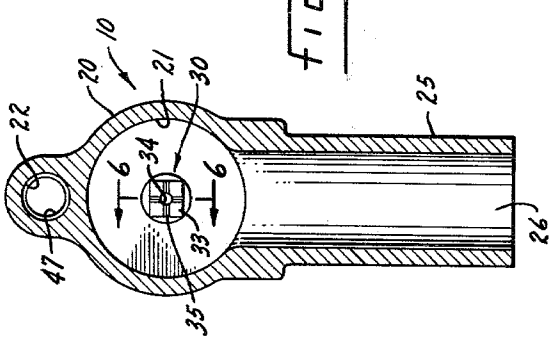


FIG. 5.

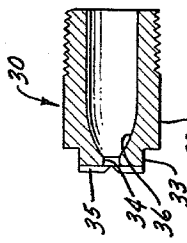


FIG. 6.

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GUN FOR SPRAYING POWDER OR FIBROUS MATERIAL

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This invention relates to spraying devices and concerns, more particularly, a gun for spraying powder or fibrous material into place.

It is the primary aim of the invention to provide an efficient and easily operated gun for wetting dry powder or fibrous material and spraying the moistened material onto a surface to be coated.

An object of the invention is to provide a novel gun of the above type which requires no special handling or loading of the material being applied. A bag or container of the fibrous material is simply opened, and the gun functions to draw out, moisten, and apply the material to the surface being coated.

Another object is to provide a gun of the above character which avoids "dusting," that is discharging dry material that has not been properly moistened, and which also contains the water being utilized so as to minimize dripping and water waste.

It is also an object to provide a gun as described above which is trouble-free in operation in that few moving parts are utilized and that all nozzles are shielded against accidental clogging.

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings, in which:

FIGURE 1 is a somewhat diagrammatic elevation of a gun constructed in accordance with the present invention in operation;

FIG. 2 is an enlarged side elevation, partially in section, of the gun shown in FIG. 1;

FIG. 3 is an enlarged elevation taken approximately along the line 3—3 in FIG. 2;

FIG. 4 is a fragmentary section taken along the line 4—4 in FIG. 3;

FIG. 5 is a section taken along the line 5—5 in FIG. 2; and

FIG. 6 is an enlarged section taken along the line 6—6 in FIG. 5.

While the invention will be described in connection with a preferred embodiment, it will be understood that I do not intend to limit the invention to that embodiment. On the contrary, I intend to cover all alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Turning now to FIG. 1, there is shown a gun 10 constructed in accordance with the invention spraying dry material from a container 11 onto a surface 12. The material of the container 11 is moistened with water from a water line 13, although it will be appreciated that any other fluid such as an adhesive or binder could be utilized.

The dry material in the container 11 can be any type of mineral wool, asbestos fiber, wall plaster or other powder or fibrous material suitable for the particular job in hand.

For conveying the material being sprayed from the container 11 to the gun 10, a large diameter flexible hose 14 is coupled to the gun 10 at one end and has its opposite end stuck down into the container. It is contemplated that the gun be manipulated by one operator while his assistant or helper holds the hose 14 into a supply of the material being sprayed. For drawing the dry material from the container 11 and generating a

spraying force, an air line 15 is coupled to the gun 10 and connected to a source of air under pressure (not shown). Manually operated control valves 16 and 17 are preferably interposed between the lines 13, 15, respectively, and the gun 10.

In keeping with the invention, the gun 10 includes a unitary body, preferably a single casting 20, defining elongated parallel first and second chambers 21 and 22. The first chamber 21 has a closed end 23 and an open end 24 through which the material being sprayed is propelled against the surface 12 that is to be coated. A handle-defining collar 25 is formed integrally with the casting 20 so as to provide a passage 26 opening into the chamber 21 adjacent the closed end 23. As can be seen in FIG. 1, the flexible hose 14 is snugly fitted about the collar 25 so as to provide a continuous connection from the container 11 to the chamber 21. In addition, the elongated collar 25 serves as a pistol-grip type of handle for the gun 10 which greatly facilitates operation of the equipment.

For drawing material from the container 11 and ejecting it through the open end 24 of the chamber 21, a nozzle 30 is mounted in the closed chamber end 23 in communication with the air line 15 and is formed to produce an ejection pattern that expands substantially perpendicularly with respect to the axis of the elongated chamber 21. Preferably, the nozzle 30 is a square spray liquid nozzle and is threadably seated in an opening 31 formed through the cylinder end 23. The line 15 is also threadably anchored in the opening 31 so that a direct path is provided from the air line to the nozzle 30. To produce its particular spray pattern, the nozzle is formed with a generally cylindrical body 32 having a square head 33 through which an ejection aperture 34 is formed. A pair of cross cuts 35 are formed on the outer face of the square head 33 and the interior of the nozzle includes a rounded portion 36 which tapers the inner diameter of the nozzle down to the aperture 34.

It has been found that nozzles of the type represented by the nozzle 30 exert a powerful drawing effect when supplying air under pressure to the chamber 21 that quickly and reliably lifts dry or fibrous material through the hose 14 from a container such as the container 11. This effect was not experienced with a conventional straight-line or simple annular nozzle, but the widespread ejection pattern from the nozzle 30 reliably creates a powerful vacuum in the chamber 21 that quickly draws the material, in quantity, through the hose 14. Unusually high pressures are not required and commercial guns of this type are conventionally used with normally available air supply systems that deliver air at 80 to 90 p.s.i.

For moistening the dry material, a pair of nozzles 41 and 42 are mounted on the gun body casting 20 adjacent the open end 24 of the chamber 21 so as to direct opposed, fan shaped sprays of water 43 and 44, respectively, across the open chamber end 24. The nozzles 41, 42 are threaded into an annular chamber 45 surrounding the chamber 21 and defined by an integral portion 46 of the casting 20. The annular chamber 45 opens into the elongated chamber 22, and the water line 13 is threaded at 47 into the chamber 22 so that water supplied under pressure by the line 13 travels through the chamber 22 and fills the annular chamber 46 to be discharged through the nozzles 41, 42.

The nozzles 41, 42, in order to produce the fan shaped sprays 43, 44, are formed with deflecting portions 48 and 49, respectively, which overlie ejecting apertures 51 and 52, respectively. The water under pressure in the annular chamber 45 is discharged through the apertures 51, 52 and strikes the portions 48, 49 so as to create the desired sprays.

It will be appreciated that each of the opposed sprays **43, 44** completely covers the open end **24** of the chamber **21** so that the material being discharged through the chamber passes through a double-spray curtain of water and, hence, is completely and reliably moistened. It has been found that because of this construction, the phenomenon of dusting is not encountered. All of the ejected material is completely wetted.

As a feature of the invention, the gun **10** is formed with a hood **55**, preferably formed integrally with the casting **20**, which forms upper and lower extensions of the chamber **21** and which surrounds the water nozzles **41, 42** so as to contain the sprays **43, 44** and deeply recess the water nozzles. There are several advantageous results flowing from this disposition of the hood **55**. In the first place, water waste is virtually eliminated since the hood **55** extends sufficiently far outwardly of the nozzles **41, 42** to completely contain the sprays **43, 44** and, hence, all of the water ejected from the nozzles is either initially mixed and carried on with the dry material being ejected or else strikes the interior surfaces of the hood **55** where it collects and runs down into a trough **56** formed by the lower chamber extension portion of the hood **55**. It can be seen that the trough **56** is in alinement with the open end **24** through which the dry material is ejected and, thus, the water which collects in the interior of the hood **55** runs back into the path of ejected dry material so that it is fully utilized. As a result, water wastage is minimized.

The annoying problem of having water drip from the gun **10** is also eliminated by the hood **55** since the hood traps the water not initially mixed with the dry material and redirects it to a position in front of the open chamber end **24**. There is, therefore, no region or area on the gun where water can collect to run back onto the operator.

The hood **55** also prevents the gun **10** from being rendered inoperative through the plugging up of the nozzles **41, 42** with foreign material. It is natural for the operator of a gun of this type to rest the unit on its forward face when it is not in use. The hood **55** thus serves as a convenient base for supporting the gun when so positioned and the deep recessing of the nozzles **41, 42** within the hood **55** keeps the nozzles clear of the supporting floor surface and thus well away from foreign materials which could foul the nozzles and prevent proper formation of the water sparys.

In a practical construction, it is desirable to provide additional openings into the chamber **45** for clearing the chamber of casting sand and, to plug these openings in the illustrated embodiment, a plurality of solid plugs **57** are utilized.

I claim as my invention:

1. An assembly for spraying dry material onto a surface comprising, in combination, a gun defining a chamber having one open end and one closed end, an open container of dry material, a hose opening into said chamber adjacent said closed end and extending down into said material in said container, a nozzle in said closed end of the chamber, means for projecting a blast of air through said nozzle so as to draw said material from said container and eject it from said open end, a pair of water nozzles mounted on said gun and positioned for directing opposed, fan shaped sprays of water across said open end of said chamber, said sprays substantially covering said open end, a hood on said body forming upper and lower extensions of said chamber and surrounding said water nozzles so as to contain said sprays and deeply recess said water nozzles, and means for directing a flow of water to said nozzles.

2. A gun for drawing up, moistening and spraying dry material comprising, in combination, a unitary body defining elongated parallel first and second chambers, said first chamber having one open end and one closed end, a first nozzle in said closed end of said first chamber for producing an ejection pattern that expands substantially perpendicularly to the axis of said chamber, said body having a handle-defining collar opening into said first chamber adjacent said closed end, a pair of water nozzles mounted in communication with said second chamber and positioned for directing opposed, fan shaped sprays of water across said open end of said first chamber, said sprays substantially covering said open end, a hood on said body forming upper and lower extensions of said first chamber and surrounding said water nozzles so as to contain said sprays and deeply recess said water nozzles, and means for directing air under pressure to said first nozzle and water under pressure to said second chamber.

3. A gun for moistening and spraying dry material comprising, in combination, a body defining an elongated cylindrical chamber having one open end and one closed end, means for admitting dry material into said chamber adjacent said closed end, an air nozzle in said closed end of said chamber, means for projecting a blast of air into said air nozzle so as to draw the dry material into said chamber and eject it from said open end, a pair of spaced water nozzles mounted on said body adjacent the open end of said chamber and positioned for directing opposed fan-shaped sprays of water across the open end of said chamber, a substantially elliptical hood on said body extending outwardly from said open end of said chamber and outwardly beyond said water nozzles so as to contain said fan-shaped sprays and deeply recess said water nozzles within said hood, said elliptical hood having its major axis located in alinement with said water nozzles and oriented substantially horizontal during operation of said gun so as to divide said hood into upper and lower portions, means for directing a flow of water to said water nozzles to moisten the dry material as it is ejected on said open end and through said fan-shaped sprays, and said lower portion of said elliptical hood forming a trough in alinement with the lower portion of said chamber so that the water sprayed from said water nozzles is either initially mixed with the dry material being ejected or a portion thereof is collected in said trough in the path of the ejected dry material.

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