

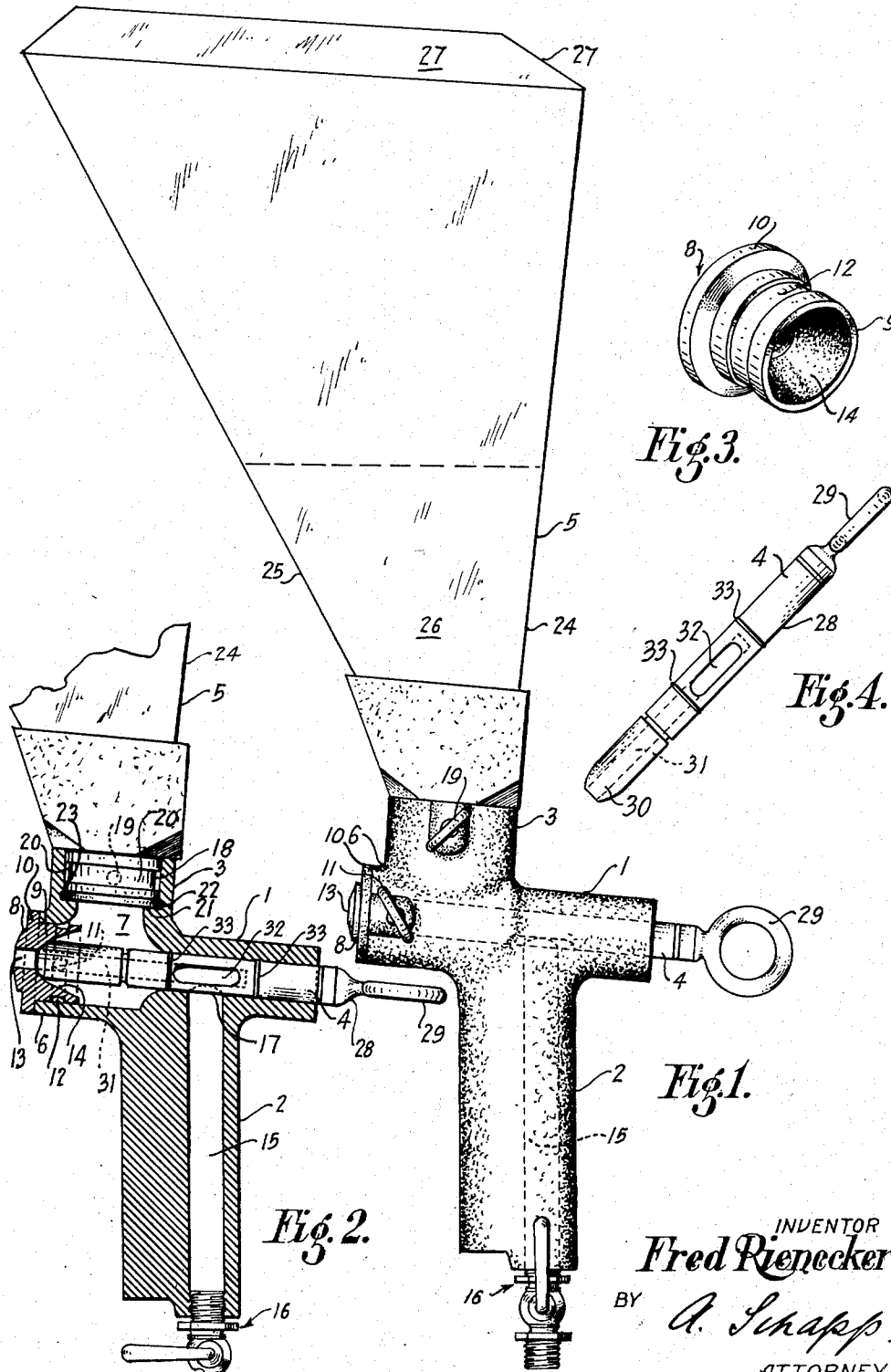
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HOPPER SPRAY GUN

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HOPPER SPRAY GUN

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4 Claims. (Cl. 299—86)

The present invention relates to improvements in a hopper spray gun, and has particular reference to a gun for spraying cementitious materials, liquid or dry, such as cement, plaster or asphaltic material to a wall or ceiling surfaces.

The principal object of the present invention is to provide a spray gun of the character described which feeds from a hopper carried by the gun and in which the material is carried by a stream or jet of compressed air.

It is further proposed in my invention, to provide a gun of the character described which is simple in construction, easy to operate, and which may be readily taken apart for cleaning purposes.

It is further proposed to provide a hopper specially designed for balancing over the gun, the hopper being removable for cleaning purposes, and also adjustable to different positions to bring the center of gravity substantially over the grip of the gun, regardless of whether the gun is pointed upward for spraying the upper portion of a wall or the ceiling, or is pointed downwardly for spraying the lower portion of the wall.

And finally, it is proposed to provide a very simple valve control for the air feed and the material feed, the entire control being concentrated in a single valve stem, which may be readily removed for cleaning purposes.

Further objects and advantages of my invention will appear as the specification proceeds, and the new and useful features of my hopper spray gun will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawing forming part of this application, in which:

Figure 1 shows a side view of my hopper spray gun;

Figure 2, a vertical section through the gun;

Figure 3, a perspective detail view of a nozzle used in my invention; and

Figure 4, a detail side view of a valve used in my invention.

While I have shown only the preferred form of the invention, it should be understood that various changes or modifications may be made within the scope of the claims attached hereto, without departing from the spirit of the invention.

Referring to the drawing in detail, my invention comprises in its principal features, a gun including a cylindrical housing 1, a grip or handle 2 projecting downwardly in a substantially midway position, an annular flange 3 rising from the forward end of the housing, a valve 4 in the housing, and a hopper 5 mounted in the flange 3.

The housing 1 is enlarged in its front portion, as shown at 6 to provide an enlarged chamber 7. The housing carries, at its front end, the nozzle or orifice 8, which is in the form of a sleeve 9 slidable in the housing, and a flange 10 bearing on the end of the housing, the sleeve being held in position by means of a set screw 11 threaded into the housing wall and engaging in a groove 12 in the sleeve.

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Interiorly, the hole of the nozzle is reduced to a relatively small size, as at 13, and spreads toward the rear to form a tapered valve seat 14.

The handle or grip 2 is in the nature of a pistol grip and projects downwardly from the housing 1 with a slight rearward incline, as shown. It is formed with a conduit 15 running along the rear edge thereof, the lower end of the conduit being connected, by means of a nipple 16, to a source of compressed air, and the upper end of the conduit discharging into the housing, as at 17.

The flange 3 is made to receive the neck 18 of the hopper 5, the neck being held in place by a set screw 19 threaded into the flange and engaging in a groove 20 in the neck. The latter is free to revolve in the flange when the set screw is loosened.

The flange 3 leaves an annular shoulder 21 at the bottom thereof for the neck of the hopper to rest on, and at the joint between the flange and the shoulder, I provide an annular cavity for receiving an O-ring 22. The latter serves as packing for the extreme end of the neck which is slightly recessed to pass the ring, as at 23.

The hopper 5 is made to expand pyramidically from bottom to top, but varies slightly from the form of a true pyramid insofar as, in the position illustrated, the rear wall 24 rises perpendicularly with respect to the axis of the housing, while the front wall 25 rises at a forward incline. The side walls 26 rise at angles similar to that of the front wall.

The upper edges of the four walls of the hopper are formed with inclined, inwardly projecting flanges 27 joined at their corners, the flange over the perpendicular rear wall being somewhat wider than the other flanges to prevent the material from spilling over the rear wall.

The valve 4 is in the form of a straight cylindrical stem 28 substantially co-extensive with the length of the housing and formed with a loop 29 at the outer end thereof. The stem has a sliding and revolving fit with the rear portion of the housing, and has a tapered front end, as at 30, bearing against the valve seat 14 in the nozzle 8 when the stem is fully inserted.

The forward portion of the stem passes through the chamber 7 formed in the enlarged forward portion of the housing 1.

When the stem is fully inserted, its forward taper, bearing on the valve seat 14 of the nozzle, closes the chamber 7 against the nozzle 13, but when the stem is retracted a short distance, material from the chamber 7 is free to pass through the hole.

The front portion of the stem 28 is formed with an axial passage 31 which extends from the extreme tip to a point slightly beyond the conduit 15 in the handle, and the passage connects with the conduit through a port 32.

The port 32 is sufficiently long to establish communication between the passage and the conduit, even when the valve stem is retracted sufficiently to allow of free flow of material from the chamber 7 to the nozzle hole 13. This communication may be broken, however, by a turning movement of the stem.

Suitable packing may be provided, in the form of O-rings 33, on opposite sides of the port 32.

In operation:

Assuming that the hopper is filled with material to a suitable height and the nipple 16 is connected to a source of compressed air, with the valve 4 pushed in fully and turned to inactive position, the operator grips the handle 2, directs the nozzle 8 toward the work and turns the handle 29 to establish connection between the conduit 15 and the passage 31 through the port 32.

Air under pressure is now free to pass through the nozzle hole 13, and the pressure may be adjusted by means of the valve in the nipple 16.

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Next, the operator retracts the handle 29 to withdraw the end of the stem from the valve seat 14 and to allow material, which has descended from the hopper into the chamber 7 to be entrained in the air jet and to be discharged against the wall or other object to be coated.

As long as the material is to be applied to a region calling for an upward incline of the housing, such as the upper part of a wall or a ceiling, the operator will adjust the hopper to the position shown, with the rear wall perpendicular to the housing. This will move the center of gravity of the hopper directly over the handle 2 when the housing is inclined to a certain upward angle and will retain the center of gravity approximately over the handle as long as the housing remains near said angle, so that the hopper will remain well-balanced at any practical upwrd angle.

When the operator proceeds to coat the lower portion of the wall, which calls for holding the cylinder wall at a downward angle, he will turn the hopper through an angle of 180 degrees, in which case he will again find the center of gravity of the hopper directly over the handle at a definite downward angle, and well-balanced over the handle at any practical downward angle.

The hopper may be readily removed upon loosening the set screw 19; the valve stem 4 may be easily withdrawn through the rear end of the housing 1, and the nozzle 8 may be pulled out upon loosening the set screw 11, so that all the parts are easily accessible for cleaning purposes.

I claim:

1. A spray gun comprising, a cylindrical housing, a valve having a stem substantially coextensive with the length of the housing and insertible thereinto from the rear end and having a sliding fit with the rear end of the housing, the stem forming an annular chamber with the front end of the housing, a nozzle mounted upon the front end of the housing, cooperative means on the stem and the nozzle for opening and closing the chamber to the nozzle as the stem is retracted and advanced, means for feeding spray material into the chamber and means for passing air under pressure axially through the stem toward the nozzle to entrain the material for discharge through the nozzle when the stem is retracted the latter means including cooperative lateral ports in the stem and the housing, the stem being revoluble in the housing for moving its port out of registry with the port of the housing and for cutting off the air supply when the stem is turned.

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2. A spray gun comprising a cylindrical housing having an enlarged forward end, a hopper mounted over the forward end and communicating therewith, a grip depending from the housing and having an air conduit therein, a valve stem revoluble and slidable in the housing, and having an axial passage therein, with a lateral port for the passage operable for communicating with the conduit, and a nozzle at the front end of the housing in opposing relation to the valve stem, whereby compressed air fed through the grip conduit is made to be ejected through the passage in the stem and the nozzle while entraining material from the hopper.

3. A spray gun comprising a cylindrical housing having an enlarged forward end, a hopper mounted over the forward end and communicating therewith, a grip depending from the housing and having an air conduit therein, a valve stem revoluble and slidable in the housing, and having an axial passage therein, with a lateral port for the passage operable for communicating with the conduit, and a nozzle at the front end of the housing in opposing relation to the valve stem, whereby compressed air fed through the grip conduit is made to be ejected through the passage in the stem and the nozzle while entraining material from the hopper, the valve stem having means for closing the nozzle against the hopper on an advance movement.

4. A spray gun comprising a cylindrical housing having an enlarged forward end, a hopper mounted over the forward end and communicating therewith, a grip depending from the housing and having an air conduit therein, a valve stem revoluble and slidable in the housing and having an axial passage therein, with a lateral port for the passage operable for communicating with the conduit, and a nozzle at the front end of the housing in opposing relation to the valve stem, whereby compressed air fed through the grip conduit is made to be ejected through the passage in the stem and the nozzle while entraining material from the hopper, the valve stem having means for closing the nozzle against the hopper on an advance movement, and being operable by a turning movement to cut off the compressed air supply.

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