CEMENT SPRAY GUN

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A spray gun for cement or the like material which has counteral moving parts, which is composed essentially of elements which are threadedly connected together and which may be readily threadedly disassembled for cleaning purposes. The gun comprises a Tee section with a plug and a pipe section connected with the aligned holes, respectively, of the Tee section, a plug of smaller diameter threadedly received in a central bore in the larger plug, an elongated tube threadedly connected to the interior of the smaller plug and extending axially through the Tee and through the larger pipe section, a nozzle connecting to the end of the tube by means of a female adapter, a threaded cap connected on the outer end of the pipe section adjacent the nozzle, aligned holes in the nozzle and the cap, a tapered recess on the inside of the threaded cap and a complementary tapered tip on the nozzle, a cement supply pipe connected to the third opening in the Tee section, means supplying cement under pressure to the cement supply pipe and a conduit with associated control valve supplying air under controllable pressure to the small plug.

1 Claim, 3 Drawing Figures
CEMENT UNDER PRESSURE

AIR CONTROL VALVE

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CEMENT SPRAY GUN

The present invention relates to a spray gun for cement or similar materials and more particularly to a spray gun which is easily assembled for use and readily disassembled for cleaning.

Many spray guns for cement and the like materials have been designed and proposed heretofore; for the most part, however, the spray guns are difficult to assemble, are difficult to take apart for cleaning purposes, many contain internal moving parts and others are bulky and difficult to handle.

The present invention, on the other hand, utilizes a cement spray gun which is composed almost entirely of conventional plumbing or piping components as will hereinafter appear; the only elements which are specially machined are the nozzle at the end of the air supply assembly and the complementary cap which, together with the nozzle, provides the means for ejecting the cement and forming the desired spray pattern.

The air supply is located centrally of the gun and terminates with the nozzle referred to above. The cement is introduced into the annular chamber surrounding the air supply assembly and at a distance considerably upstream from the nozzle. The cement spray pattern is determined, first of all, by the position of the rotatable cap relative to the nozzle and, secondly, by the pressure of the air to the air supply assembly. No triggers or moving parts are required in the instant cement spray gun.

In light of the above, it is a principal object of the present invention to provide a cement spray gun which is relatively simple to assemble.

It is a further object of the present invention to provide a cement spray gun which can be readily disassembled for cleaning purposes.

It is a further object of the present invention to provide a cement spray gun which has no moving parts.

It is a still further object of the present invention to provide a spray gun having an elongated air supply assembly extending through the gun and terminating in a nozzle, a threaded and adjustable cap on the gun adjacent said nozzle, aligned openings in the nozzle and cap and complementary tapered surfaces on the end of the nozzle and on the adjacent portion of the cap.

It is a still further object of the present invention to provide a spray gun of the type described above wherein the spray pattern can be varied by adjusting the rotary position of the cap and a valve which supplies air to the air supply assembly.

Other and further objects and advantageous features of the present invention will hereinafter more fully appear in connection with a detailed description of the drawings in which:

FIG. 1 is a longitudinal sectional view through the spray gun of the present invention;

FIG. 2 is an enlarged sectional view of the left hand end of the spray gun of FIG. 1; and

FIG. 3 is a side elevation of the spray gun with a diagrammatic showing of the connections to the air supply.

Referring to the drawings in detail, FIGS. 1 and 3 show a spray gun, generally designated by the reference numeral 10. The spray gun 10 is composed of a central Tee member 12, a short pipe section or nipple 14 threadedly engaging, at its right hand end, the internal threads at the left hand opening 16 of the Tee 12; the left hand threaded end of the pipe section 14 engages the internal threads in the opening 18 of a threaded cap 20. The cap 20 is provided with a small central opening 22 which communicates, at its inner end, with a tapered or conical opening 24 whose larger dimension terminates or intersects with a flat surface 26 which constitutes the inner end of the main opening 18.

The Tee 12 is also provided with an opening 28 opposite from, and in alignment with, the opening 16. Openings 16 and 28 form the ends of the through-passageway of the Tee 12. The opening 28 is provided with internal threads which mate with the external threads 30 of a hollow threaded plug 32. The end 34 of the threaded plug 32 is provided with a central opening 36 which is threaded so as to receive the external threads 38 of a smaller plug 40. The plug 40 is provided with a threaded bore 42 whose left hand end is counter-tapped to provide a threaded hole 44.

An elongated pipe section or tube 46 of relatively smaller diameter (than the pipe section 14) is located within the spray gun 10 such that the right hand end of this tube 46 threadedly engages the threads in the hole 44. The left hand end of the tube 46 threadedly engages the right hand end of the internal bore 48 of a female adapter 50. The left hand end of the threaded bore 48 of the connector 50 threadedly engages the right hand end of a short nipple 52 which constitutes a nozzle as will be described hereinafter. The nipple 52 is provided with a central, longitudinally extending, opening 54 which is preferably slightly smaller than the opening 22 and in axial alignment therewith. The outer, left hand, end of the nozzle 52 is tapered at 56 so as to present a conical surface substantially parallel to the conical surface of the opening 24, as best shown in FIG. 2.

The Tee 12 is provided with a third threaded opening 58 which is adapted to receive the upper threaded end of a hollow pipe 60. The opening 58 defines a passageway in the Tee which is perpendicular to the through passageway described above.

As best shown in FIG. 3, the small plug 40 is connected to an air conduit 62 in any convenient manner. A valve 64 is located in any appropriate position along the conduit 62 to control the supply of air through the conduit 62 and into the gun 10. Cement, under pressure, is provided through the internal bore of the pipe 60 from any convenient source (not shown).

The resulting air supply assembly, consisting of the plug 40, the tube 46, the adapter 50 and the nozzle 52, provides a central flow, or jet, of air through the gun 10. The space between the foregoing elements and the plug 32, Tee 12 and the pipe section 14 constitutes an annular chamber 66 in the gun for the cement which is supplied through the pipe 60.

Turning again to a consideration of FIG. 2, the cap 20 is adjustable with respect to the pipe section 14; that is, the cap 20 can be turned on its threaded connection 18 to move the same inwardly or outwardly with respect to the gun and thereby vary the space between the conical tip 56 of the nozzle 52 and the conical surface 24. The jet or flow of air from the opening 54 through the aligned opening 22 will create a Venturi or jet effect in the space defined by the opening 24 and the tip 56 of the nozzle 52 so as to pull cement from the annular chamber 66. Thus, by varying the position of the cap 20 and the quantity of air flowing through the
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gun by means of the valve 64, the resulting spray pattern of the cement can be varied to achieve any desired effect. Location of the opening 48 of the cement supply pipe 60 in a position sufficiently rearward (or downstream) of the nozzle 52 will insure that the annular space 66 will be filled with cement; thus, when the vacuum effect is created at the nozzle, as described above, the withdrawal (or ejection) of cement from the gun 10 will be substantially uniform.

One of the principal advantages of the present invention resides in the fact that it can be readily disassembled for cleaning purposes. Except for the nozzle 52 and the cap 20, the gun 10 is composed of essentially conventional plumbing or piping. By unscrewing the small plug 40 from the larger plug 32, the air supply assembly consisting of the plug 40, tube 46, adapter 50 and nozzle 52 can be completely removed from the gun 10. This latter assembly can be further disassembled for cleaning if desired. Thereafter the pipe 60, plug 32, cap 20 and pipe section 14 may be removed from their threaded connections and these elements can be cleaned if desired.

Also, it should be noted that there are no moving parts inside the gun 10 which can go out of adjustment. The cement will be supplied under a substantially constant pressure from any convenient source (not shown). As indicated above, the only controls are the adjustment of the valve 64 and adjustment of the cap 20 with respect to the nozzle 52. The operator need not keep a trigger depressed during the operation of the gun 10.

From the foregoing description, it should be apparent that the cement will turn a corner (or 90° angle) when passing from the pipe 60 into the annular chamber 66 towards the orifice 22. With this design the cement is forced around all sides of the orifice and is actually sucked through by the jet effect previously described. In this regard it should be pointed out that the air is turned on first before the cement reaches the orifice; the supply of cement under pressure is fed to the gun after the air is turned on, so that, when the cement does reach the orifice the desired pattern is created and the flow is continuous.

Whereas the present invention has been described in particular relation to the illustrations in the drawings, it should be understood that other and further modifications may be made within the spirit and scope of this invention.

What is claimed is:

1. A cement spray gun comprising a hollow Tee section having two axially aligned openings defining a first passageway and a third opening defining a second passageway perpendicular to said first passageway, a hollow threaded pipe section having one end connected to said first opening of said Tee section, a hollow plug threadedly connected to said second opening of said Tee section, a cement supply pipe threadedly connecting with said third opening of said Tee section, means for supplying cement under pressure to said cement supply pipe, a hollow threaded cap threadedly engaging the other end of said pipe section, an elongated air supply assembly threadedly connected at one end to said hollow plug and extending inwardly through said gun substantially coaxial with said first passageway and said threaded pipe section, said air supply assembly terminating at one end in a nozzle adjacent said hollow cap and at its other end in a connection extending externally of said threaded plug, means for supplying air under controllable pressure to said connection on said air supply assembly, said nozzle having a central opening therethrough for discharging a stream of air from said air supply assembly, the tip of said nozzle having a conical surface thereon, the tip of said nozzle having a first opening of substantially constant diameter in axial alignment with and larger than the central opening in said nozzle and a second conical opening extending inwardly from said first opening in parallel relation with the conical surface of the tip of said nozzle, the space between said air supply assembly and the interior of said spray gun defining an annular chamber for receiving cement from said cement supply pipe, said threaded cap being rotatably adjustable on the other end of said pipe section so as to vary the space between said second conical opening on said threaded cap and the conical surface on the tip of said nozzle, said air supply assembly including a second and smaller hollow plug threadedly engaging a central opening in the first-mentioned hollow plug, an elongated tubular member threaded at its ends extending inwardly through said spray gun and threadedly connected at one end to an inner threaded opening in said second hollow plug, an internally threaded female adapter connected at one end to the other end of said tubular member, said nozzle being threadedly connected to the other end of said adapter, whereby all of the elements of said spray gun may be disassembled into their individual components by means of the threaded connections so as to facilitate the cleaning of parts of said spray gun.