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SPRAYING DEVICE FOR SPRAYING AND FUSING POWDERED MATERIAL

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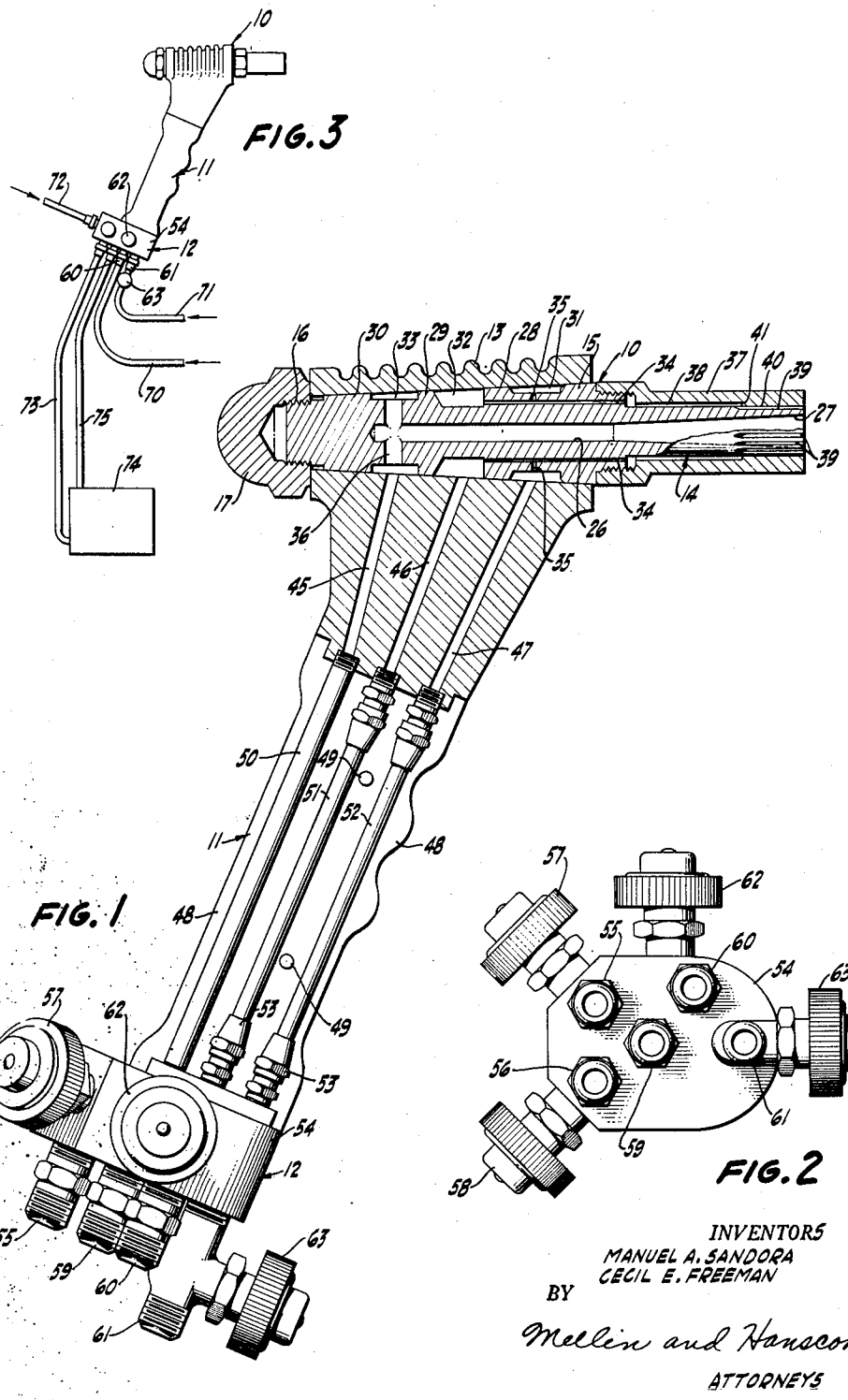


FIG. 3

FIG. 1

FIG. 2

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SPRAYING DEVICE FOR SPRAYING AND FUSING POWDERED MATERIAL

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4 Claims. (Cl. 91—12.2)

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This invention relates to a spray gun of the type wherein a suspension of powdered, fusible material in compressed air is formed, and the same is ejected from the gun together with a burning mixture of oxygen and combustible gas.

In spray guns of this character it is desirable to achieve an intimate mixture of combustible gas and oxygen, to maintain an even flow of materials, and to operate with the utmost economy of materials.

It is an object of the present invention to provide an improved type of spray gun.

It is a particular object of the invention to provide a spray gun capable of efficient operation, a steady, smooth delivery of materials and economy of operation.

These and other objects of the invention will be apparent from the ensuing description and the appended claims.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings in which:

Fig. 1 is a side view of the gun and a manifold therefor, showing the gun and its handle in section and the manifold in elevation.

Fig. 2 is a bottom view of the manifold.

Fig. 3 is a diagrammatic view of a complete spray gun system.

Referring now to the drawings, the device of the invention in its preferred form comprises a gun 10, a handle 11 and a manifold 12. The gun 10 comprises a tubular housing 13, co-axially of which is disposed a tubular member 14. The tube 14 is provided with a tapered flange or collar 15 to provide an airtight fit with the forward end of the housing, and at its rearward end it is threaded at 16 so as to be engageable with a nut 17 to clamp the tube firmly in the housing.

The tube 14 is provided with a central bore or duct 26 closed at its rearward end as shown and flared at its forward end at 27, and it is also provided with spaced annular flanges 28, 29 and 30 defining annular recesses 31, 32 and 33. Longitudinal ducts 34 are provided as shown, and radial ducts 35 are provided communicating the annular recess 31 with the ducts 34. Radial ducts 36 communicate the annular recess 33 with the central duct 26. A sleeve 37 is provided, being threaded to the tube 14 and forming an annular passage 38 communicating with the ducts 34.

As shown, the forward end of the tube 14 is grooved to provide longitudinal grooves or passages 39, and the sleeve 37 is of reduced inside diameter at its forward end at 40 so as to provide an annular shoulder 41 disposed slightly forwardly of the rear ends of the grooved section 39. Thus the annular passage 38 is in effect continued but is caused to change its course for a purpose explained hereinafter.

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The handle portion 11 of the gun assembly comprises mating portions 48, of which only one is shown, clamped together by means of screws 49. Disposed within the handle are tubes 50, 51 and 52 communicating at their upper ends with the ducts 45, 46 and 47, respectively, and at their lower ends with the manifold 12, coupling members 53 being employed with the tubes 51 and 52, as shown.

The manifold 12 may be of any suitable type, but preferably it is of the type described in our copending application Serial No. 51,426, filed September 27, 1948, entitled "Spraying device and manifold therefor," which may be consulted for details. Briefly, the manifold 12 comprises a block 54 which is provided with valves and coupling members as shown, and with internal ducts (not shown). An air inlet coupling 55 is provided for entry of compressed air, an air outlet coupling 56, air control valves 57 and 58, an inlet coupling 59, combustible gas and oxygen inlet couplings 60 and 61, respectively, and valves 62 and 63 for controlling combustible gas and oxygen, respectively.

As explained in greater detail in the aforesaid copending application, by closing the valve 57 and opening the valve 58, all of the compressed air is directed to the outlet 56, and by closing the valve 58 and opening the valve 57, all of the air is directed to the tube 50, thence to the gun 10. By appropriately adjusting the valves 57 and 58, any desired proportion of air is directed to the outlet 56 or to the tube 50. Referring to Fig. 3, there is shown a spray gun system, including the gun 10, handle 11 and manifold 12. Combustible gas and oxygen enter through ducts 70 and 71, respectively, under control of valves 62 and 63. Compressed air enters through a duct 72, and by manipulation of valves 57 and 58, any desired proportion is sent directly to the gun through tube 50 or through a tube 73 to a dispenser or agitator 74 (where a dust is picked up), thence through a duct 75 and the manifold 12 to the tube 50 and the gun.

It will thus be apparent that a spray gun, and a spray gun system, are provided which are of compact, simple design. Thus, all of the controls (for air, dust, combustible gas and oxygen) are brought together within a small compass adjacent the handle of the gun. All of the supply

tubes lead through the handle of the gun, thus obviating the awkwardness of supply lines entering at the rear of the gun. The offset passage for combustible gas and oxygen formed by the annular passage 38, grooves 39 and shoulder 41 create a turbulence which enhances the efficiency of combustion thus saving substantially in consumption of oxygen.

While we have shown the preferred form of our invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A spray gun comprising an inner tubular member adapted to deliver a suspension of solid material in air, said inner tubular member being provided with a plurality of axially disposed grooves at its outer end and on its exterior surface, said grooves terminating at the outer end of said inner tubular member, and an outer tubular member concentrically disposed with respect to said inner tubular member and spaced therefrom to provide an annular passage for combustible gas and oxygen, said outer tubular member being of lesser inside diameter at its forward end adjacent the grooved portion of said inner tubular member so as to provide an annular shoulder and an offset continuation of said annular passage.

2. A spray gun comprising an inner tubular member adapted to deliver a suspension of solid material in air and having at its forward end a plurality of axial grooves formed on its exterior surface and terminating at its outer end, and an outer tubular member spaced from said inner tubular member to provide an annular passage for delivery of combustible gas and oxygen, the said outer tubular member being of lesser inside diameter at its outer end to provide an annular shoulder and an offset continuation of said annular passage.

3. A spray gun comprising an inner tubular member defining an axial passage for a suspension of solid material in air, an outer tubular member disposed at the forward portion of said inner member and defining therewith an annular passage for combustible gas and oxygen, a tubular housing for the rearward portion of said inner member, and a handle secured to said housing, said handle having separate ducts for suspension, combustible gas and oxygen formed therein, said inner member having axially spaced, annular flanges forming a close fit with and spacing the inner member from said housing and sealing the outlet ends of said ducts from one another, said inner member being formed with a mixing chest communicating with said annular passage and with said gas and oxygen ducts, said inner member also being provided with a passage communicating said suspension duct with said axial passage.

4. A spray gun comprising an inner tubular member defining an axial passage for a suspension of solid material in air, an outer tubular member disposed at the forward portion of said inner member and defining therewith an annular passage for combustible gas and oxygen, a tubular housing for the rearward portion of said inner member, a handle secured to said housing, said handle having separate ducts for suspension, combustible gas and oxygen formed therein, axially spaced, annular sealing members spacing the inner member from said housing and sealing the outlet ends of said ducts from one another, said inner member being formed with a mixing chest communicating with said annular passage and with said gas and oxygen ducts, said inner member also being provided with a passage communicating said suspension duct with said axial passage.

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