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APPARATUS FOR APPLYING COATING MATERIAL

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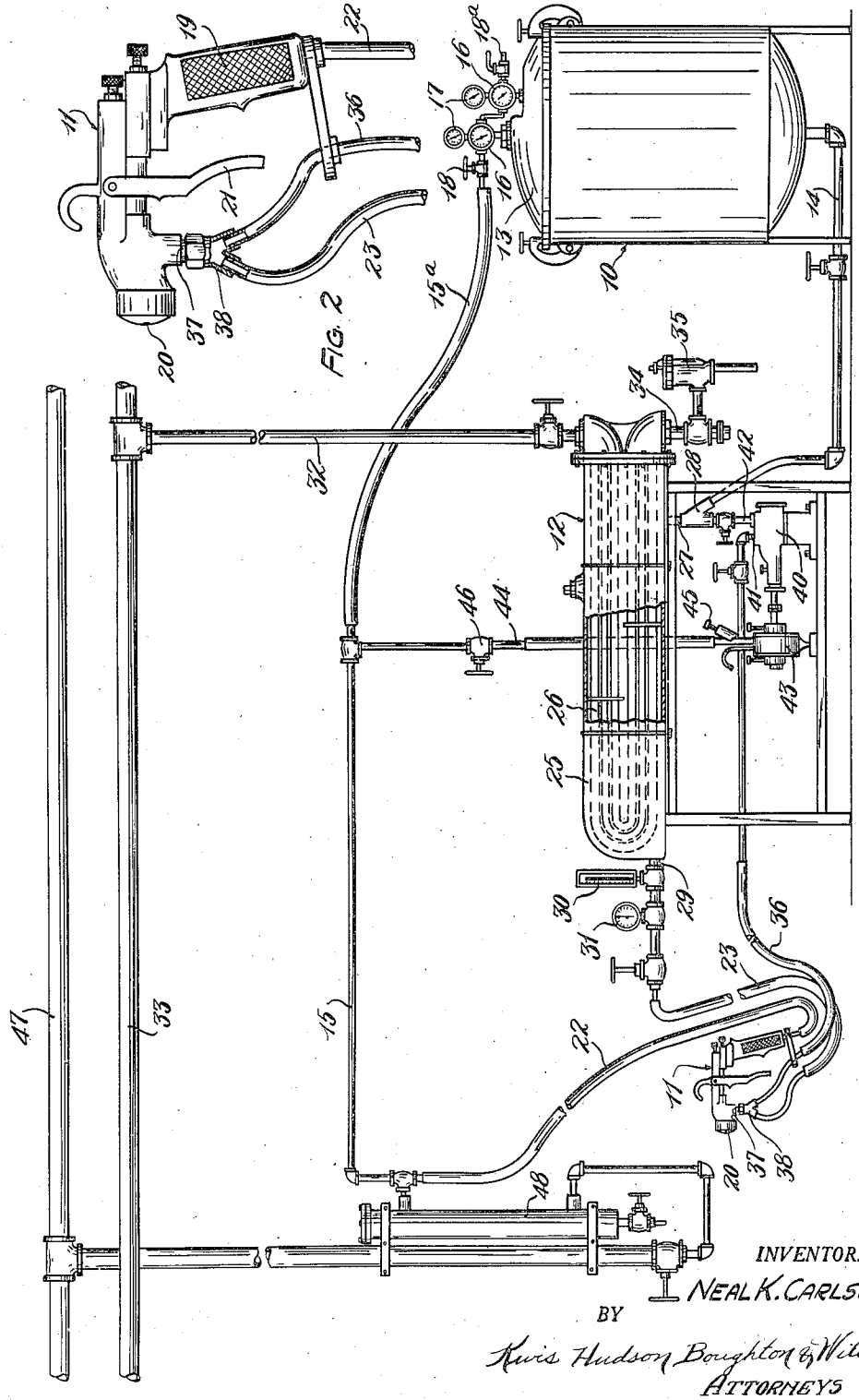


FIG. 1

FIG. 2

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APPARATUS FOR APPLYING COATING MATERIAL

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2 Claims. (Cl. 91—45)

This invention relates to the application of coating material and more particularly to a novel apparatus for use in applying coating material while in a heated condition.

An object of my invention is to provide a novel apparatus for applying heated coating material and in which the congealing of the material in the conduits and spray device or applicator is effectively prevented.

Another object of this invention is to provide a novel apparatus of the kind mentioned involving the use of an applicator and a heater for the coating material, and in which a continuous circulation of the coating material is maintained between the heater and applicator.

A further object of this invention is to provide a novel apparatus for the application of coating material wherein a stream of the material is delivered through a heater to an applicator so that a portion of the material flows away from the applicator and wherein such diverted portion is pumped back into said stream at the receiving end of the heater for repassage therethrough.

The invention may further be briefly summarized as consisting in certain novel combinations and arrangements of parts, hereinafter described in detail and particularly set out in the appended claims.

In the accompanying sheet of drawings,

Fig. 1 is an elevational view illustrating my novel apparatus for the application of heated coating material and,

Fig. 2 is an elevational view showing the applicator or spray device on a larger scale and with portions thereof broken away.

It is desirable to apply certain coating materials, such as lacquer, while in a heated condition and the tendency for such materials to congeal in the applicator and conduits presents a troublesome problem. This tendency to congeal occurs particularly when the coating operation is temporarily interrupted. As will be explained more in detail hereinafter, the present invention overcomes this difficulty by maintaining a free-flowing supply of the heated coating material at the applicator at all times.

In the form of the apparatus shown in the drawing, I provide a tank 10 adapted to contain a supply of lacquer or other fluid coating material of the kind to be applied while hot, and an applicator 11 to which the coating material is supplied for application to a desired surface or article. A heater 12 located between the tank and applicator heats the material being supplied to the latter.

The supply tank or reservoir 10 is provided with a cover 13 by which it can be closed and sealed so that a pressure condition can be maintained in the tank for discharging the coating material therefrom through the delivery conduit or pipe 14. The pressure condition can be created in the tank 10 by supplying compressed air thereto through the pipe 15 and the hose 15a. The air connection to the tank is preferably made through the cover 13 and may include suitable pressure regulating valves 16 and pressure gauges 17. This air connection may also include a shut-off valve 18 and a relief cock 18a.

The applicator 11 is here shown as being a mechanical or atomizing applicator of the kind known as a spray gun. This device includes a handle 19 by which it can be held and manipulated, and a nozzle 20 from which atomized coating material is discharged. The delivery of the atomized coating material is controlled by the lever or trigger 21. Compressed air for the atomization of the coating material is supplied to the applicator through the hose or conduit 22. The heated coating material is supplied to the applicator through the hose or conduit 23.

The heater 12 may be of the kind comprising an insulated shell 25 forming a container for a quantity of the coating material to be heated, and a heating coil 26 inside the shell in direct contact with such material. The shell 25 has an inlet connection 27 for the material to be heated and with which the delivery pipe 14 from the tank 10 is connected by means of the Y-fitting 28. The shell also has a discharge connection 29 for the delivery of the heated material and which is connected with the applicator 11 by the conduit 23. The discharge connection 29 may include a thermometer 30 and a pressure gauge 31. A suitable heating medium, such as steam, may be supplied to the coil 26 through a pipe 32 leading from the steam line 33 and the condensate may be discharged from the coil 26 through the exhaust connection 34 and the steam trap 35.

As already stated in a general way, I prevent the congealing of the coating material by maintaining a free-flowing supply of the heated material at the applicator 11 at all times and, to this end, I maintain a continuous circulation of the coating material between the heater 12 and the applicator. For this purpose I provide a return conduit 36 as a branch or continuation of the conduit 23 and which carries coating material away from the applicator. It is desirable to bring the circulating material as close to the applicator 11 as practical and this is accomplished by connecting the conduits 23 and 36 with the receiving

nipple 37 of the applicator by means of the Y-fitting 38.

The coating material which is diverted or returned from the applicator 11 by the conduit 36 is forced back into the main passage or stream of coating material at or adjacent the receiving end of the heater 12. For this purpose I provide a suitable pump 40 having an intake 41 with which the conduit 36 is connected, and a discharge 42 which is connected with the receiving end of the heater through the Y-fitting 28. The pump 40 may be driven by any suitable power device such as the air motor 43 which is connected therewith. Compressed air is supplied to the motor 43 through the pipe 44 and the speed of the motor may be controlled by the needle valve 45. A shut-off valve 46 may also be provided in the pipe 44 ahead of the needle valve 45.

The compressed air supply for the tank 10, the applicator 11, and the air motor 43, may be obtained from the main air line 47. These devices may be supplied directly from the line 47 but are preferably connected therewith through a separator 48 which serves to remove water and sediment from the compressed air being supplied.

In my novel apparatus, the coating material in the tank 10 is discharged therefrom by the pressure in the tank and is forced through the heater 12 to the Y-fitting 38 at the applicator 11. The pressure in the tank should be such that heated coating material can be supplied to the Y-fitting 38 at a rate in excess of the maximum rate of discharge from the nozzle 20. If the applicator is being used, some of the heated material is discharged or sprayed from the nozzle 20 and the remainder or excess returns through the line 36 to the intake of the pump 40. The operation of the pump should be such that it increases or boosts the pressure of the coating material somewhat above the pressure in the main stream in the piping 14 and forces the diverted material back into such main stream for repassage through the heater 12. If the applicator 11 is idle, all of the heated material being supplied through the conduit 23 is returned or withdrawn through the conduit 36 and is forced by the pump back into the main fluid passage at the receiving end of the heater. Thus the pump 40 will maintain a continuous circulation of coating material between the heater and applicator regardless of whether the applicator is being used or is idle, and hence, this pump can be referred to as a recirculating pump.

Although the drawing shows but one applicator 11, it is obvious that a number of such applicators can be connected with and served by the heater 12 and the pump 40.

From the foregoing description and accompanying drawing it will now be readily understood that I have provided a novel apparatus for applying coating material in a heated condition, and wherein the congealing of the material in the applicator and conduits is effectively prevented. It will also be seen that a continuous circulation of the coating material is maintained between the applicator and heater so that a supply of free-flowing coating material at the desired temperature will always be available at the applicator and even though the applicator is temporarily idle, there will be little or no tendency for the coating material to congeal.

While I have illustrated and described my novel coating apparatus in considerable detail, it should be understood that I do not intend my invention to be correspondingly limited but regard the same as including all changes and modifications coming within the scope of the appended claims.

Having thus described my invention, I claim:

1. In a system of the character described, a spray gun of the kind adapted to utilize air pressure for atomizing fluid spray material, a tank adapted to contain a quantity of said fluid spray material, a supply connection from said tank to said gun for supplying spray material to the latter, a heater between said tank and gun and adapted to heat the material being supplied to the latter, said tank being a closed tank adapted to be supplied with air under pressure sufficient for delivering spray material therefrom to the spray gun through said supply connection and heater in a quantity in excess of that required by the spray gun when the latter is being operated, means connected with said tank for supplying said air under pressure thereto, means for supplying air under pressure to said spray gun for use in atomizing said spray material, and a recirculating pump having its intake communicating with said supply connection at a point adjacent said gun and its discharge communicating with said supply connection on the tank-side of said heater, said pump being operable to cause spray material to be returned from said gun to said supply connection at a point adjacent the inlet end of the heater so that a quantity of the spray material will be circulated continuously between the heater and gun during both the operative and inoperative condition of the gun.

2. In a system of the character described, a spray gun of the kind adapted to utilize air under pressure for atomizing fluid spray material, a tank adapted to contain a quantity of said fluid spray material, a heater for said material having its receiving end connected with said tank and its delivery end connected with said gun, said tank being closed and adapted to be supplied with air under pressure sufficient for delivering therefrom a stream of spray material to the gun through said heater under an initial pressure and in a volume in excess of that required by the gun when the latter is being operated, means connected with said tank for supplying said air under pressure thereto, means for supplying said air under pressure to the spray gun for use in atomizing said spray material, and a recirculating pump having its intake communicating with the delivery connection of the heater at a point closely adjacent said gun and its discharge connected with the receiving end of the heater, said pump being operable to withdraw a portion of the material being supplied to the gun and to increase the pressure of the withdrawn material above said initial pressure and to discharge the withdrawn material into said stream adjacent the receiving end of the heater.

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