

Aug. 6, 1957

L. BECK

2,802,089

PAINT PREHEATERS

Filed Dec. 24, 1954

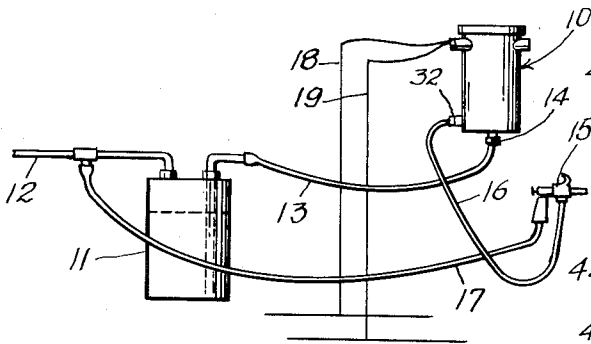


FIG 1

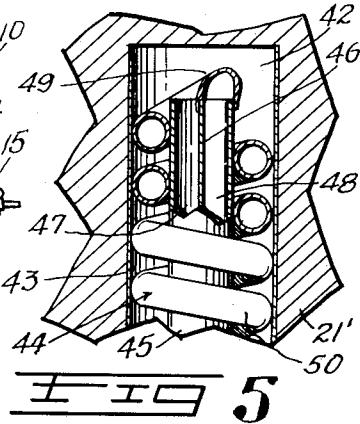


FIG 5

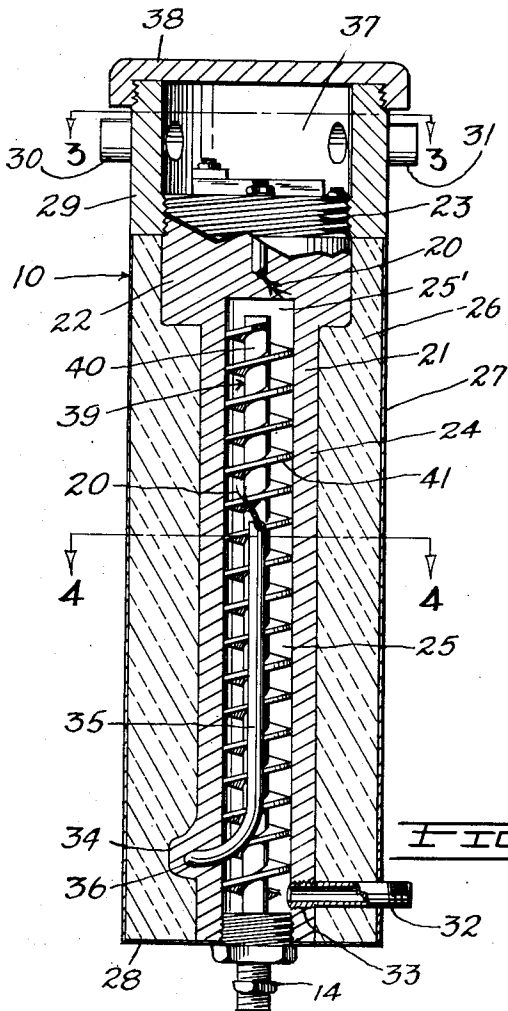


FIG 2

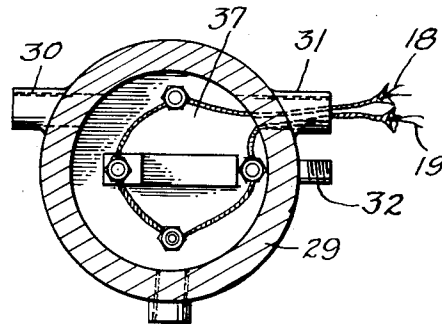


FIG 3

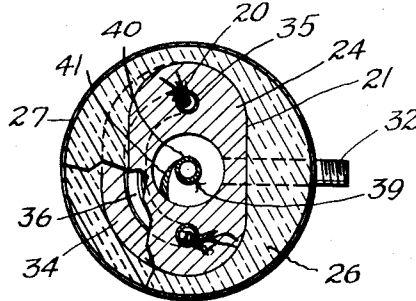


FIG 4

INVENTOR.
Louis Beck

BY
Howard L. Thompson
ATTORNEY

1

2,802,089

PAINT PREHEATERS

Louis Beck, Cleveland, Ohio

Application December 24, 1954, Serial No. 477,551

8 Claims. (Cl. 219—39)

This invention relates to devices for heating paint prior to spraying the same upon a surface through the medium of a spray gun. More particularly, the invention deals with a heater device of the character described employing an insulated heater cylinder, having a paint circulating chamber, opening through one end of the cylinder and a spiral member arranged in the cylinder to extend the flow of paint in passage through the cylinder, facilitating the quick heating thereof.

Still more particularly, the invention deals with a heater of the character described employing a casing of elliptical cross-sectional form and, in which, the heater elements for heating the casing are disposed.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

Fig. 1 is a diagrammatic view illustrating one of my improved preheaters and the coupling thereof with the source of paint supply and the discharge nozzle.

Fig. 2 is an enlarged longitudinal sectional view through the preheater, with parts of the construction shown in elevation and broken away.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 2; and

Fig. 5 is an enlarged detailed sectional view of part of the upper portion of the cylinder of a heater unit, showing a modification.

In Fig. 1 of the drawing, I have diagrammatically shown, at 10, one of my improved preheaters. At 11 is shown a paint container, with which a pressure air line 12 is coupled in pressure discharge of paint from the container 11 through a tube 13 into the lower portion of the preheater 10, the tube being coupled with a fitting 14. At 15 I have diagrammatically shown a discharge nozzle, with which the discharge tube 16 of the preheater 10 is coupled and at 17 is shown an air tube coupled with the nozzle 15 and with the supply line 12.

The system, diagrammatically shown in Fig. 1 of the drawing, is generally well known in the art and, for this reason, the diagrammatic showing is sufficient. In this figure, 18 and 19 represent the circuit wires, which extend into the preheater 10 and are coupled with a heating element, diagrammatically shown at 20 in Figs. 2 and 4 of the drawing.

The preheater comprises a moulded or cast casing 21, having an enlarged upper head end 22 externally threaded, as seen at 23. The lower portion of the casing 21 is in the form of a tube or cylinder 24 opening through the bottom, the bore 25 being closed by the plug or fitting 14. The entire casing 21, below the threads 23, is enclosed in an insulation body 26 arranged within an outer sheet metal shell 27, the latter including a bottom wall portion 28.

Detachable with the threaded end 23 of the casing is an upwardly extending sleeve portion 29 having laterally

2

extending tubular outlets 30 and 31, through which the circuit wires 18, 19 are passed and the other of these outlets may be utilized for any other purpose.

A nipple 32 is mounted in the shell 27 and extends through the insulation body 26 and is in threaded engagement with the lower portion of the cylinder 24, as seen at 33, so as to open into the chamber 25. The nipple forms the discharge and the tube 16 is coupled with the nipple, as noted in Fig. 1 of the drawing.

It will appear, from a consideration of Fig. 4 of the drawing, that the cylinder portion 24 of the casing 21 is substantially elliptical in cross-sectional form, with a slight enlargement 34 at the lower end thereof and, in the process of forming the casing 21, a tube 35 is embedded therein, the tube having ends which open through the upper end of the head 22 and a crosshead 36, which is disposed in the enlargement 34. The heater element 20 is arranged in the tube 35 and coupled with the circuit wires 18 and 19, as diagrammatically shown in Fig. 3 of the drawing, where these wires extend into the upper chamber 37 of the preheater. The upper end of the sleeve 29 is externally threaded to receive a removable coverplate 38, controlling access to the chamber 37 and forming a closure for said chamber.

At 39 I have shown a paint distributing member in the form of an elongated tube 40, having a spiral fin 41 arranged longitudinally of the outer surface thereof throughout substantially the full length of the tube 40. The tube 40 is in direct coupling with the fitting 14 and forms the paint supply tube for delivering paint to the upper portion 25' of the chamber 25. The paint then passes downwardly through the chamber 25 in the spiral fashion defined by the fins 41 to the lower end of the chamber 25, where it then passes out through the discharge nipple 32, thus into the tube 16.

With preheaters of the type under consideration, other accessories are employed, such as temperature controls and regulators, as well as pressure gauges, but these are omitted in the present disclosure in order to simplify the showing and, further, in that such accessories form no part of the present conception.

In Fig. 5 of the drawing, I have shown a slight modification and, in this figure, 21' represents a casing, generally similar to the casing 21. In this casing, the chamber 42, generally similar to the chamber 25, has a lining tube 43 and at 44 is a paint supply and circulating member, which differs from the member 39 in that a tube 45 has a central vertical partition 46, which provides two chambers 47 and 48 in the tube 45. With this construction, the chamber 47 may be utilized as the paint supply chamber; whereas, the chamber 48 has the upper end portion 49 of a coil 50 in communication therewith, so that the coil 50, which spirals downwardly in the chamber 42, can be utilized for the circulation of a heating medium therethrough in directly heating the paint as it passes downwardly through the chamber 42. With this type of construction, the heating medium, such for example as the heating coil 20, can be dispensed with. It will be understood that the unit 44, in its entirety, can be removed from the chamber 42 through the lower end of the casing 21', similar to the casing 21. It will, of course, be apparent that two definite sources of supply will be coupled with the lower end of the unit beyond the casing 21.

It will appear from the foregoing that, with both forms of construction shown, the paint or other fluid which is heated in the heater unit, is passed through a spiral passage in the operation of heating the same and prior to discharge from the heater casing.

One of the advantages of the structure disclosed is that simple means is provided for removal of the units 39 and 44 from the respective casings in the operation

of cleaning the chambers of the casings and also in cleaning said units.

It will be apparent that, by arrangement of the cross-head 36 with the heating element therein at the lower admission end of the preheater, a greater amount of heat will prevail at the lower end of the preheater, thus overcoming the cooling effect of the incoming paint, in other words, insuring proper temperature of the paint discharged through the tube 32. My preheater also becomes highly efficient from the standpoint of maintaining the cooler paint at the interior of the bore or chamber 25 with the heated paint circulating down along the walls of the heated cylinder. This will overcome high surges and low declines of the heating element employed, in other words, will maintain a more stable operation of the preheater.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In paint preheaters of the character described, comprising an insulated casing, the casing having a closed enlarged head end and an elongated tubular paint circulating cylinder extending downwardly from said head end, said cylinder forming a bore opening outwardly through the lower end of the cylinder, a paint supply and circulating unit detachable with the bore of said cylinder through the open end thereof, said unit comprising a tube, with means for spirally circulating paint in the bore of said cylinder around said tube, and means, at the lower end portion of the cylinder extending into said bore, for discharging paint therefrom.

2. In paint preheaters of the character described, comprising an insulated casing, the casing having a closed enlarged head end and an elongated tubular paint circulating cylinder extending downwardly from said head end, said cylinder forming a bore opening outwardly through the lower end of the cylinder, a paint supply and circulating unit detachable with the bore of said cylinder through the open end thereof, said unit comprising a tube, with means for spirally circulating paint in the bore of said cylinder around said tube, means, at the lower end portion of the cylinder extending into said bore, for discharging paint therefrom, and said spiral circulating means comprising a spiral fin on the outer surface of said tube.

3. In paint preheaters of the character described, comprising an insulated casing, the casing having a closed enlarged head end and an elongated tubular paint circulating cylinder extending downwardly from said head end, said cylinder forming a bore opening outwardly through the lower end of the cylinder, a paint supply and circulating unit detachable with the bore of said cylinder through the open end thereof, said unit comprising a tube, with means for spirally circulating paint in the bore of said cylinder around said tube, means, at the lower end portion of the cylinder extending into said bore, for discharging paint therefrom, and said spiral circulating means comprising a tubular heater coil, through which a heating medium is adapted to be circulated.

4. A paint preheater of the character described, comprising an elongated casing having a long tubular portion defining a bore, the bore being open at the lower end, the upper end of the bore being closed by an enlarged integral head having an externally threaded upper portion, a sleeve coupled with the threaded portion and extending above the head to form a chamber spaced from said bore, a cover detachable with said sleeve and forming a closure for said chamber, the casing being enclosed in an insulation jacket, means arranged in the casing for heating the tubular portion thereof, an elongated paint supply tube arranged centrally within and extending longitudinally of said bore for supply of paint to the upper closed end of said bore, the paint passing downwardly through the bore around said supply tube, means for moving the paint in a spiral fashion to the lower discharge end of the bore, and a tubular discharge

coupled with the lower end of the casing and extending into the lower portion of the bore for discharging heated paint therefrom.

5. A paint preheater of the character described, comprising an elongated casing having a long tubular portion defining a bore, the bore being open at the lower end, the upper end of the bore being closed by an enlarged integral head having an externally threaded upper portion, a sleeve coupled with the threaded portion and extending above the head to form a chamber spaced from said bore, a cover detachable with said sleeve and forming a closure for said chamber, the casing being enclosed in an insulation jacket, means arranged in the casing for heating the tubular portion thereof, an elongated paint supply tube arranged centrally within and extending longitudinally of said bore for supply of paint to the upper closed end of said bore, the paint passing downwardly through the bore around said supply tube, means for moving the paint in a spiral fashion to the lower discharge end of the bore, a tubular discharge coupled with the lower end of the casing and extending into the lower portion of the bore for discharging heated paint therefrom, and said first named means comprising an electric heating element embedded in said casing and having ends extending through the head into the upper chamber of said casing.

6. A paint preheater of the character described, comprising an elongated casing having a long tubular portion defining a bore, the bore being open at the lower end, the upper end of the bore being closed by an enlarged integral head having an externally threaded upper portion, a sleeve coupled with the threaded portion and extending above the head to form a chamber spaced from said bore, a cover detachable with said sleeve and forming a closure for said chamber, the casing being enclosed in an insulation jacket, means arranged in the casing for heating the tubular portion thereof, an elongated paint supply tube arranged centrally within and extending longitudinally of said bore for supply of paint to the upper closed end of said bore, the paint passing downwardly through the bore around said supply tube, means for moving the paint in a spiral fashion to the lower discharge end of the bore, a tubular discharge coupled with the lower end of the casing and extending into the lower portion of the bore for discharging heated paint therefrom, and the tubular portion of said casing being elliptical in cross-sectional form.

7. A paint preheater of the character described, comprising an elongated casing having a long tubular portion defining a bore, the bore being open at the lower end, the upper end of the bore being closed by an enlarged integral head having an externally threaded upper portion, a sleeve coupled with the threaded portion and extending above the head to form a chamber spaced from said bore, a cover detachable with said sleeve and forming a closure for said chamber, the casing being enclosed in an insulation jacket, means arranged in the casing for heating the tubular portion thereof, an elongated paint supply tube arranged centrally within and extending longitudinally of said bore for supply of paint to the upper closed end of said bore, the paint passing downwardly through the bore around said supply tube, said first named means comprising a spiral coil arranged in the bore around said paint supply tube, said coil directing the paint in a spiral fashion to the lower end of the bore, and means mounted in the lower end of the casing and communicating with the bore for discharging heated paint therefrom.

8. A paint preheater of the character described, comprising an elongated casing having a long tubular portion defining a bore, the bore being open at the lower end, the upper end of the bore being closed by an enlarged integral head having an externally threaded upper portion, a sleeve coupled with the threaded portion and extending above the head to form a chamber spaced from

5

said bore, a cover detachable with said sleeve and forming a closure for said chamber, the casing being enclosed in an insulation jacket, means arranged in the casing for heating the tubular portion thereof, an elongated paint supply tube arranged centrally within and extending longitudinally of said bore for supply of paint to the upper closed end of said bore, the paint passing downwardly through the bore around said supply tube, said first named means comprising a spiral coil arranged in the bore around said paint supply tube, said coil directing the paint in a spiral fashion to the lower end of the bore, means mounted in the lower end of the casing and communicating with

5

10

6

the bore for discharging heated paint therefrom, and means extending through the paint supply tube for circulation of a heating medium to said spiral coil.

References Cited in the file of this patent

UNITED STATES PATENTS

1,239,572	De Khotinsky	Sept. 11, 1917
1,539,039	Blanding	May 26, 1925
1,671,677	Keeton	May 29, 1928
2,481,813	Bede	Sept. 13, 1949
2,530,799	Arvintz et al.	Nov. 21, 1950