Aug. 12, 1952 O. R. SMITH 2,606,549

HEATING APPARATUS FOR THE COATING CONTAINING TANKS OF PIPE CONDITIONING MACHINES

Filed Aug. 18, 1949 2 SHEETS—SHEET 1

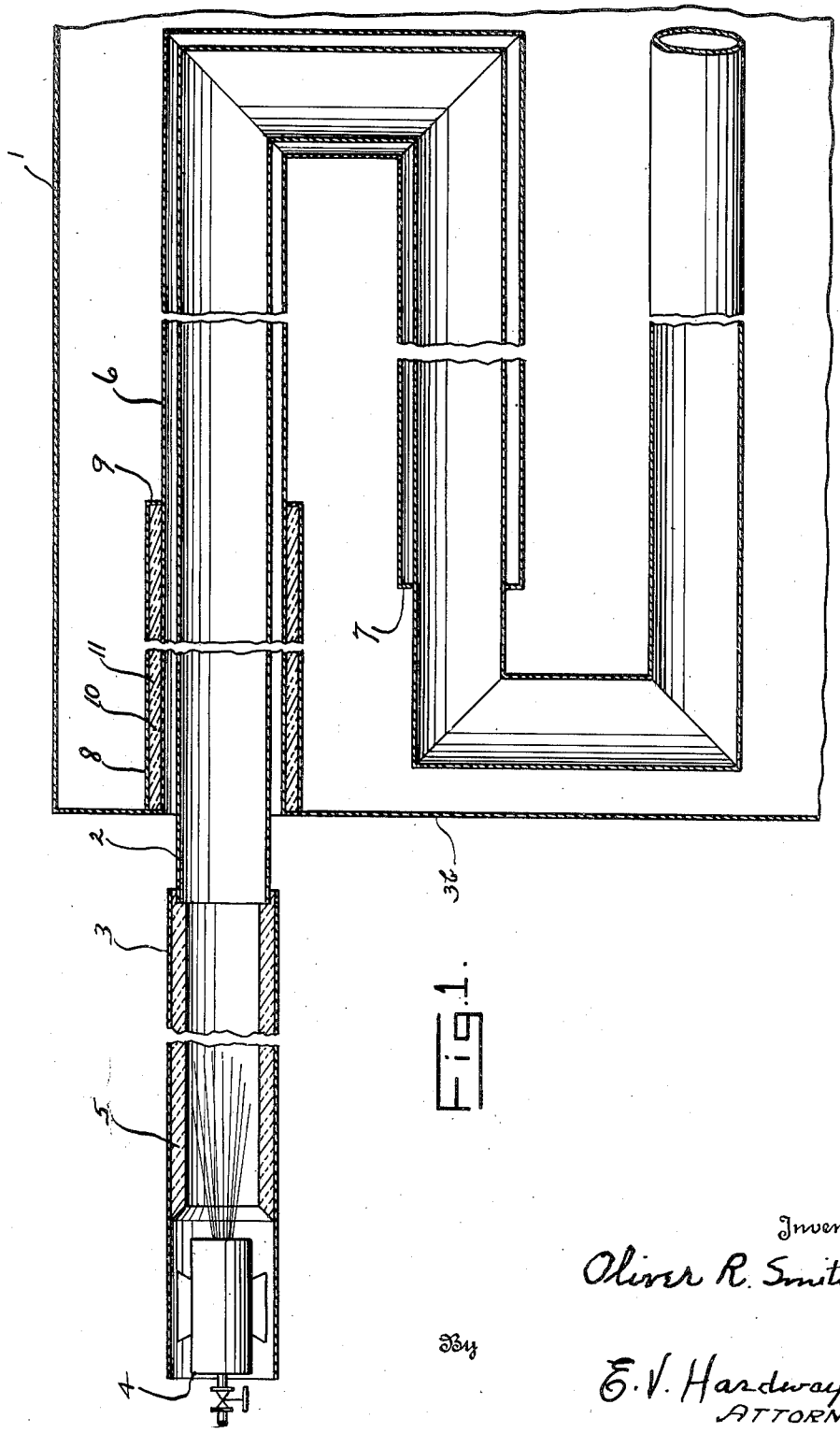


Fig. 1.

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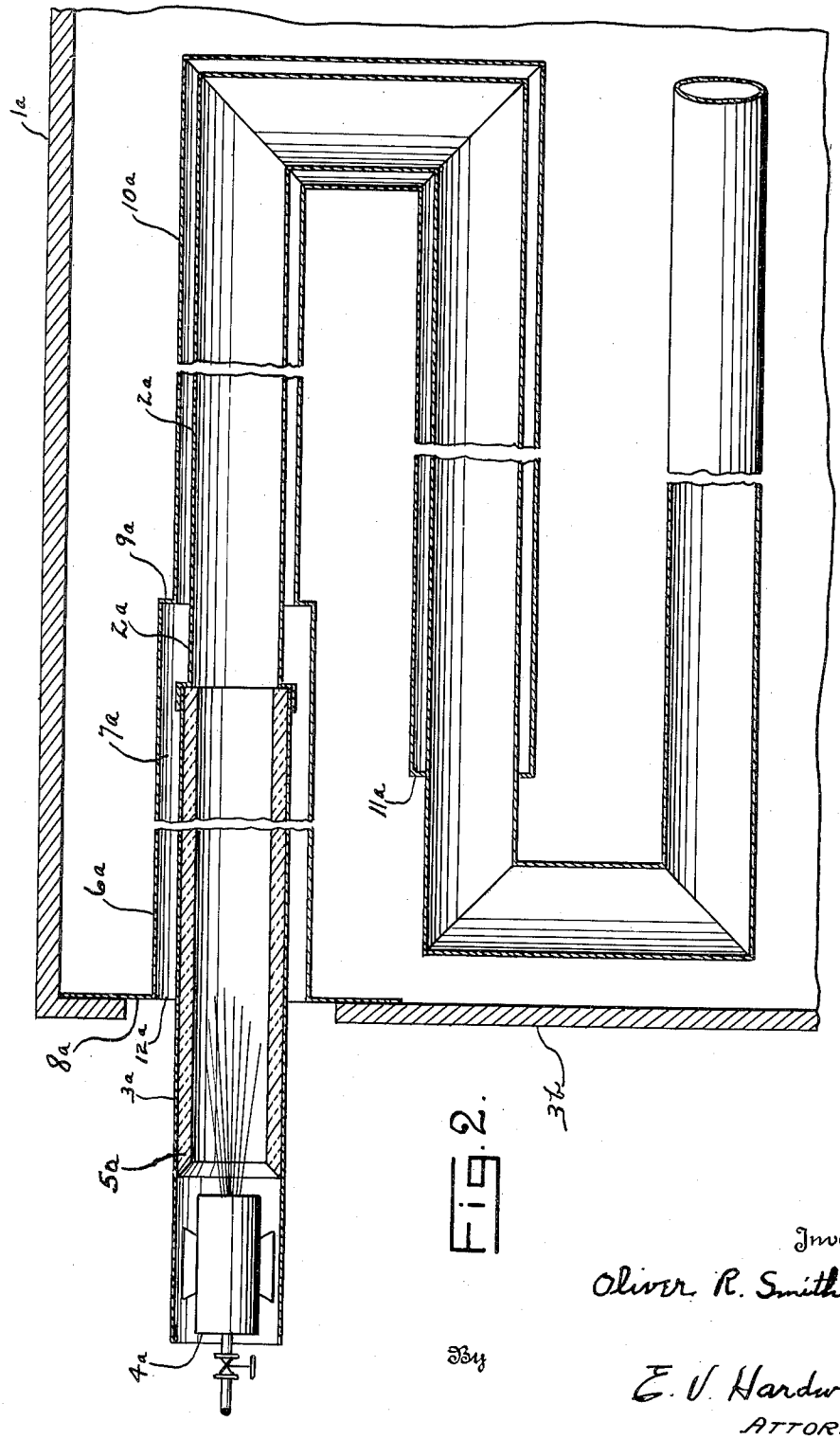


Fig. 2.

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HEATING APPARATUS FOR THE COATING CONTAINING TANKS OF PIPE CONDITIONING MACHINES

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8 Claims. (Cl. 126—360)

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This invention relates to a heating apparatus for the coating containing tanks of pipe conditioning machines.

The invention embodies certain improvements over the heating apparatus as disclosed in pending application for a Pipe Conditioning Machine, filed by applicant in the United States Patent Office October 9, 1948, under Serial Number 53,713 now matured into Patent No. 2,554,067, issued May 22, 1951.

An object of this invention is to provide means to protect the coil and the liquid in the tank of the pipe conditioning machine from the excessive heat generated by the burner or furnace, such means being located to protect the coil from burning out and the liquid from becoming overheated or burned at the points where the burner produces the highest degree of heat.

Another object of the invention is to provide a tubular body to contain the heating unit and to be connected to the coil in the tank of a pipe conditioning machine, said body being adapted to be lined with refractory material on the inside thereof to prevent it from burning out.

Another feature of the invention is to provide a tube or tubes adapted to surround the coil in spaced relationship to provide air space around the coils at the points where the heat is most intense and, thereby, reducing the temperature so that the liquid in such vicinity will be prevented from becoming overheated or burned.

Another feature of the invention is to provide the above mentioned body and tube means so that a cheap or uncontrolled burner may be used to generate the heat instead of an expensive heat controlled furnace.

Other objects and advantages will be apparent from the following specification, which is illustrated by the accompanying drawings, wherein:

Figure 1 is a horizontal, cross-sectional view of one embodiment of the invention; and

Figure 2 is a similar view of another embodiment of the invention.

Referring now more particularly to the drawings, wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates the tank mounted on the supporting frame of a Caterpillar tractor, as shown and described in the aforesaid pending application.

In the embodiment of the invention shown in Figure 1, the coil 2 is extended through an enlarged opening in the wall 3b of the tank. There is secured, preferably by welding, to the outer end of the coil a cylinder or tube 3 which has

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an inside diameter greater than that of the coil. The other end of the tube 3 is open to receive a heating unit 4 of the uncontrolled type which is detachably secured therein. Between the heating unit and the other end of the tube 3 there is molded or cast to the inner walls thereof a heat-resistant refractory material 5. This refractory material may be of a thickness of 1" or more and of a sufficient quality to withstand the intense heat generated by the heating unit which, at such point, usually reaches the intensity of about 2300 degrees.

Although the heat upon entering the coil 2 is somewhat dissipated, it is still very intense, being normally in the neighborhood of 1400 degrees. This intense heat will cause the liquid surrounding the coil at such point to become overheated or burned. In order to avoid this becoming overheated or burned, there is provided a tube 6 having an inside diameter greater than that of the coil 2. This tube 6 is disposed around the coil 2 and spaced therefrom, and is secured at its outer end, preferably by welding, to the inside wall of the tank around said wall opening. The other end of the tube 6 is provided with an inwardly turned flange 7 which is secured, preferably by welding, to the outside wall of the coil 2, thus providing a closed chamber between the outside wall of the coil 2 and the tube 6. It will be noted that the opening in the wall 3b is greater than the tube 2 in order to admit air into said chamber, which will circulate in this space or chamber and reduce the temperature of the heat in the coil before it reaches the liquid surrounding it, thereby preventing the liquid from becoming overheated or burned.

Another relatively short tube 8 is disposed around the tube 6, and spaced therefrom, the outer end thereof being secured to the inside wall of the tank, as shown in the drawing. The other or inside end has an inwardly turned flange 9 which is secured, preferably by welding, to the outside wall of the tube 6. The tube 8 has a larger diameter than the tube 6 in order to provide the space 10 therebetween to receive the insulation material 11. This additional tube 8, with the insulation material between it and the tube 6, provides additional protection against coking of the liquid therearound. The tube 6 conforms to the curvature of the coil 2, and the tubes 6 and 8 may be of varying lengths according to the type of burner used.

In the other embodiment of the invention as shown in Figure 2, the coil 2a terminates within the tank 1a. A cylinder or tube 3a is secured

to the outer end of the coil 2a and extends outwardly through the enlarged opening in the wall of the tank. This tube 3a has a larger inside diameter than the coil 2a, and is secured, preferably by welding, to the outer end of the coil 2a.

The burner 4a is detachably secured in the outer end of the tube 3a, and moulded or cast to the inside wall of the tube 3a there is the refractory material 5a.

A relatively short tube 6a is disposed around the outer end of the coil 2a and a portion of the tube 3a, said tube 6a having a larger diameter than the tube 3a so as to provide the space 7a therebetween. The outer end of the tube 6a is provided with an outwardly turned flange 8a which is secured, preferably by welding, to the inside of the tank wall, as shown in the drawing. The other or inside end of the tube 6a has an inwardly turned flange 9a, which is secured, preferably by welding, to the wall of the outer end of another tube 10a, which is of a smaller diameter than the tube 6a. It is understood, however, that tubes 6a and 10a could be constructed of one piece of tubing, with the inner end being tapered in any desired manner. This tube 10a terminates with an inwardly turned flange 11a which is secured, preferably by welding, to the outside wall of the coil 2a, thus closing the air chamber between said tubes to permit air from the tank wall opening 12a to circulate around the tubes 3a, 6a, 10a and the coil 2a. The length and diameter of the tubes, as well as the air capacity of the chambers, may be varied according to the type of burner used.

The advantages of the invention herein described are obvious. However, it will be understood that I desire to comprehend within my invention such modifications as may be necessary to adapt it to varying conditions and uses.

What I claim is:

1. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a cylindrical body adapted to be connected to the outer end of the coil and to receive therein the heating unit, heat resistant material secured to the inner walls of said body adjacent said heating unit, and a tube around, and spaced from, said coil, said tube having its outer end fixed to the wall of the tank around said opening in surrounding spaced relation to said body, whereby an opening is formed at the outer end of said tube to allow air to enter the space between said tube and said body and having its inner end secured to said coil.

2. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a cylindrical body adapted to be connected to the outer end of the coil and to receive therein the heating unit, heat resistant material secured to the inner walls of said body adjacent said heating unit, and a tube around, and spaced from, said coil, said tube having its outer end fixed to the wall of the tank around the opening therein in surrounding spaced relation to said body whereby an opening is formed at the outer end of said tube to allow air to enter the space between said tube and said body, and at its inner end, having an inwardly turned flange thereon, secured to the coil, whereby an air chamber is provided around the coil to prevent overheating of the coating material therearound.

3. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a cylindrical body adapted to be connected to the outer end of the coil, said body extending through said opening and adapted to receive therein said heating unit, heat resistant material secured to the inner walls of said body adjacent said heating unit, a first tube around and spaced from said body and secured at its outer end to the tank about said opening, a second tube surrounding and spaced from said coil and connected at one end to the inner end of said first tube and at the other end to the outer wall of said coil, said tubes forming with said body and coil an air chamber about said body and coil within the tank and closed at its inner end.

4. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a cylindrical body adapted to be connected to the outer end of the coil and adapted to receive therein said heating unit, heat resistant material secured to the inner walls of said body adjacent said heating unit, a pair of tubes around, and spaced from each other, and said coil, heat resistant material mounted between said tubes, said tubes being secured at their outer ends to the tank around said opening, the innermost of said tubes being also secured at its inner end to the outer wall of said coil and forming therewith an air chamber within the tank surrounding said coil and closed at its inner end.

5. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a tubular member adapted to be connected to the coil, said member having said heating unit detachably mounted in the end opposite its connection with the coil, heat resistant material secured to the inner wall of said member adjacent said heating unit, a tube secured to the inner wall of said tank around said opening and spaced from the coil whereby an opening is formed at the outer end of said tube to allow air to enter the space between said tube and said coil, the opposite end of the tube being secured to the outer wall of the coil to enclose an air chamber between the outer wall of the coil and the inner wall of the tube, another relatively short tube around the tubular member and spaced therefrom, said second-named tube having its outer end secured to the inner wall of the tank and its inner end secured to the outer wall of the first-named tube, heat resistant material mounted in the space between said tubes.

6. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a tubular member having a larger diameter than the coil and connected to the outer end of the coil, said member having the heating unit detachably mounted in its outer end, refractory material secured to the inner wall of said member between the heating unit and the inner end thereof, a tube around the coil and spaced therefrom having its outer end connected to the inner wall of the tank around said opening and its inner end connected to the outer wall of the coil thereby enclosing an air chamber around the coil within the tank and open at the outer end of the tube to allow air to enter the space between the tube and said coil;

a second tube around the tubular member and spaced therefrom and having its outer end secured to the inner wall of the tank and its inner end secured to the outer wall of the first tube, and heat resistant material mounted within the space provided between said tubes.

7. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a cylindrical body extending partly into the tank through said opening and being adapted to be secured to the outer end of the coil and to receive in its other end the heating unit, heat resistant material secured to the inner wall of said body between the coil connection and the heating unit, a tubular member around, and spaced from said coil, said tubular member having an outer flanged end secured to the inner wall of the tank around said opening whereby an opening is formed at the outer end of said tubular member to allow air to enter the space between said member and said coil, the inner end of said tubular member having an inwardly turned flange secured to the outer wall of the coil.

8. Heating apparatus for coating compositions used with pipe conditioning machines, said apparatus comprising a tank having an opening, a coil in the tank, a heating unit, a cylindrical body extending partly into the tank through said opening and being adapted to be secured to the outer end of the coil and to receive the heating unit therein, heat resistant material secured to the inner wall of said body, a tubular member around, and spaced from, said coil, one end of said member being fixed to the inner wall of the tank around said opening in spaced relation to said coil, and the other end to the outer wall of the coil, thereby closing said opening within the tank and providing an air chamber around said body and coil and having an opening at the outer end of said member to allow air to enter said chamber.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
946,310	Archer	Jan. 11, 1910
1,217,064	Redkey	Feb. 20, 1917
1,368,284	Oslie	Feb. 15, 1921
1,580,974	Rembold	Apr. 13, 1926
1,689,551	Hammond	Oct. 30, 1928
2,230,076	Etnyre	Jan. 28, 1941
2,264,226	Toner	Nov. 25, 1941
2,379,155	Huff	June 26, 1945

FOREIGN PATENTS

Number	Country	Date
16,620	Great Britain	of 1909