

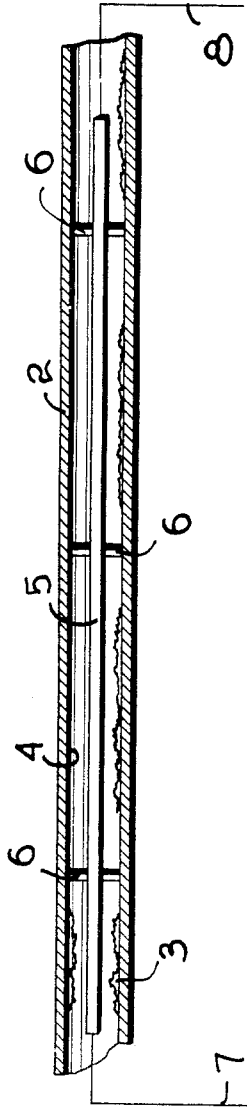
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M. R. SHAW

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REMOVING CARBONACEOUS DEPOSITS FROM STILL TUBES

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Morris R. Shaw

INVENTOR.

BY

Lester B. Clark

Ray L. Smith

ATTORNEYS

UNITED STATES PATENT OFFICE

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REMOVING CARBONACEOUS DEPOSITS
FROM STILL TUBES

Morris R. Shaw, Houston, Tex.

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2 Claims. (Cl. 134—1)

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The invention relates to a method of removing deposits from tubes, and in particular to a method of removing sedimentary deposits from petroleum refinery still tubes.

In present day practice a great deal of difficulty is encountered in cleaning sedimentary deposits from tubes such as those used in stills around refineries. Various mechanical scrapers have been devised, but these are unsatisfactory in that a great deal of time is consumed in tearing the still down and subjecting it to the cleaning operation.

It is, therefore, an object of the instant invention to find a method which can remove sedimentary deposits from refinery still tubes and the like without entailing a great deal of difficulty.

Another object of the invention is to provide a refinery still tube cleaning method which cleans the tube in situ in a relatively short time with a minimum of trouble.

Other objects of the invention will become more readily apparent from a consideration of the following description and drawing, wherein the single figure schematically illustrates a method and apparatus for practicing the instant invention.

A section of a refinery still tube is shown at 2 which has accumulated therein over a period of time the deposits 3 on the inner surface 4 thereof. The effects of these deposits are well known to those versed in the art. For example, such deposits tend to cut down greatly the operating efficiency of the still, due to heat transfer problems and the like, and also lessen the life of the tubes in which such deposits accumulate. Other deleterious effects are directly related to the accumulation of these deposits within the still tubes.

It is, therefore, desirable that the tubes be cleaned from time to time in order to maintain a high operating efficiency of the still and in order to increase the life of the tubes.

Heretofore a common practice has been to subject each tube in a battery of tubes in a still to a cleaning, such as by a mechanical scraper. This is particularly disadvantageous in that such operation consumes several hours, during which, of course, that particular piece of equipment can not be maintained in operation. With the instant invention it is possible to remove the sedimentary deposits from the interior of the tubes while they are retained in situ in the piece of equipment, such cleaning operation consuming only a matter of five to fifteen minutes, depending upon the condition of the tubes being cleaned.

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Another common practice in cleaning the tubes is to burn the deposits from the interior of the tubes by a mixture of oxygen and a gas. This is disadvantageous in that it is difficult to control the mixing and burning of the gases throughout the tube so that some parts of the tube become distorted because of differences in temperature in parts of the tube. Additionally, lack of control of the burning of the gases causes hot spots in the tubes, which in turn shortens the life of such tubes and necessitates replacement quicker.

The present invention is therefore particularly directed to a method and apparatus for applying an even heat throughout the length of a refinery still tube to burn the carbonaceous deposits therefrom.

As shown in the drawing, an induction type heater 5 is of elongated construction so that it can fit within varying size still tubes. A plurality of spacers 6 are arranged about the heater 5 so that it is maintained in spaced relation with respect to the interior wall 4 of the tube 2. In this manner an even heat may be applied about the inner wall of the tube, thereby avoiding hot spots or undue heating of any particular portion of the tube.

The spacers 6 may be of any suitable construction and configuration, and are preferably somewhat flexible so that they may be inserted into the tube to conform with the internal diameter thereof and still maintain a substantially even spacing between the inner surface of the tube 2 and such heater.

Electrical conduits 7 and 8 may be connected to the ends of the induction heater whereby a suitable amount of electrical energy may be supplied to the heater to elevate the temperature within the tube 2.

Of course, the temperature maintained within the tube 2 by the heater 5 will depend upon varying circumstances. However, as a matter of necessity, such temperature will be below the fusion point of the tubes 2 but will be at a high enough point so as to effect combustion of the deposits within the tube 2.

As a practical matter, it has been found that a temperature of from 1500° to 2000° Fahrenheit efficiently effects combustion of the deposits, which are primarily carbonaceous in nature, on the interior wall of the tube 2.

The elongated induction heater 5 may be of any suitable length so that it can clean a complete section of tube in one operation, or it may be maintained in shorter sections so that it can be moved longitudinally along the interior of the

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tube so as to stepwise remove sedimentary deposits therefrom. Preferably a whole battery of tubes within one particular piece of equipment may be supplied each with a heater so that each tube in the battery is simultaneously cleaned. As a practical matter, it has been found that maintaining the temperature between 1500° and 2000° Fahrenheit for a period of from five to fifteen minutes will thoroughly clean, or effect combustion of the deposits within the tube 2.

What is claimed is:

1. A method of removing carbonaceous deposits from still tubes in situ comprising the steps of, producing a uniform flameless heat by induction heating in the walls of a tube simultaneously throughout its whole length and of a sufficiently high temperature to destroy the deposits in the tube but not sufficiently high to adversely affect the tube.

2. In a method of removing carbonaceous deposits from the interior of a still tube by the combustion of said deposits, the steps including inducing a uniform heat of about 1,500° F. to 2,000° F. substantially throughout the whole length of the tube to destroy said deposits, and maintaining

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the induced temperature in the tube between about 1,500° F. and 2,000° F. which is below its fusion temperature to inhibit damage thereto.

MORRIS R. SHAW.

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