J. HANSEN.

PROCESS FOR EXPRESSING FLUID FROM PARAFFIN COMPOSITIONS.

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1,084,738.

Patented Jan. 20, 1914.

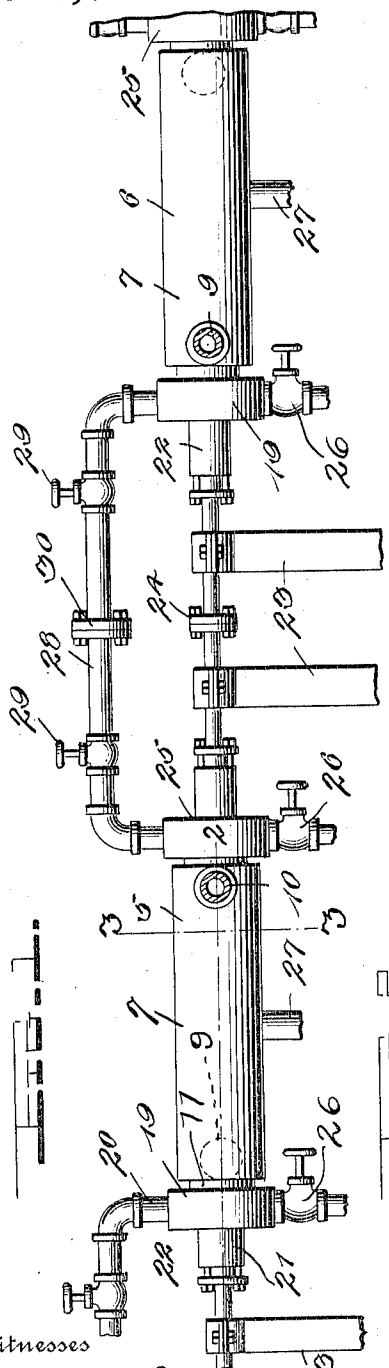


FIG. 1.

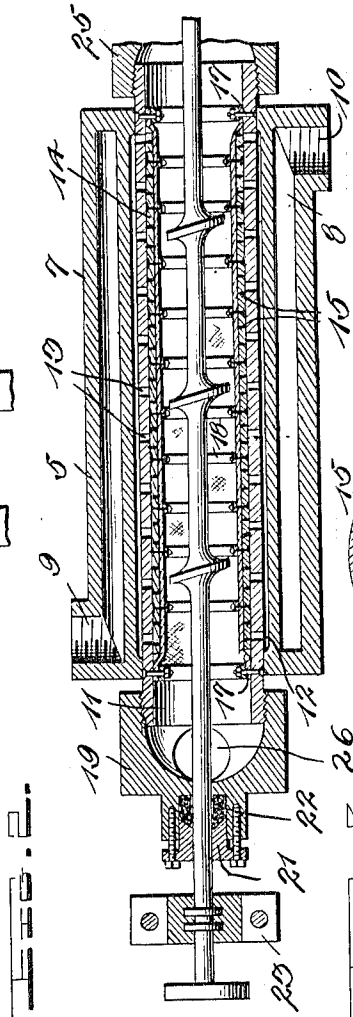


FIG. 2.

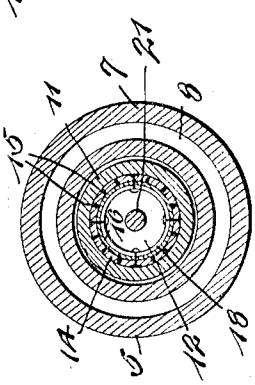


FIG. 3.

Witnesses

Chas. L. Griesauer.

A. B. Norton.

Inventor

Julius Hansen,

By Watson E. Coleman.

Attorney

UNITED STATES PATENT OFFICE.

JULIUS HANSEN, OF TEXAS CITY, TEXAS.

PROCESS FOR EXPRESSING FLUID FROM PARAFFIN COMPOSITIONS.

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Application filed February 24, 1912. Serial No. 679,652.

To all whom it may concern:

Be it known that I, JULIUS HANSEN, a citizen of the United States, residing at Texas City, in the county of Galveston and State of Texas, have invented certain new and useful Improvements in Processes for Expressing Fluid from Paraffin Compositions, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved process for expressing the fluids out of paraffin compositions and separating the scale therefrom, and to this end the invention has for its primary object the provision of a simple, and efficient process and the necessary apparatus for carrying out the process wherein the paraffin compositions are first subjected to the action of a cooling agent to precipitate the scale therein and effect the separation of such fluids as may be contained in the composite mass, and then subjecting the composition to the action of a heating agent whereby the oil and fluid may be extracted from the wax scale and the same reduced to a perfectly dry state.

With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an apparatus for carrying out my improved process; Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1; and Fig. 3 is a section taken on the line 3—3 of Fig. 1.

Referring in detail to the drawing 5 designates what I denominate a filter press into which the paraffin compositions are first admitted, and 6 indicates the scale press in which the scales are subjected to a high temperature and the oil removed therefrom. These two presses are of substantially the same construction, and the detail description of one will therefore suffice for both.

Referring to Fig. 2 it will be observed that a cylindrical casing or jacket 7 is provided, said casing having an annular chamber 8 extending the entire length thereof. One end of this chamber is provided with an inlet port 9 for a cooling agent, the other end thereof having an outlet port 10. A longitudinally disposed filter pipe 11 extends through the casing 7 and is concentrically spaced from the inner wall thereof to provide the fluid receiving chamber 12. This pipe is formed with a plurality of openings 13 through which the fluid finds its way from the interior of the pipe to said chamber. A metallic tubular member 14 is arranged within the pipe 11 and is provided with apertures 15 which are disposed out of registry with the openings in the filter pipe. A straining cloth or fabric 16 is disposed upon the inner wall of said tubular member over the apertures thereof and extends beyond the opposite ends of said member, said cloth being secured to the pipe 11 by means of the bolts or other suitable fastening devices 17. This cloth is held in concentric relation to the tubular member 14 by means of a plurality of spaced metal rings 18 which are suitably secured to said cloth. These rings are of such diameter that they will loosely hold the tubular member 14 in position between the straining cloth and the pipe 11 so that the fluid may find its way through said cloth and the apertures of the member 14 to the openings in the filter pipe.

Upon one end of the pipe 11 a chambered head 19 is threaded, and to said head the pipe 20 is connected, said pipe extending from a suitable pump which supplies the paraffin composition to the filter under pressure. This head is provided with a suitable stuffing box 21 through which the worm shaft 22 extends, said shaft being disposed centrally through the filter and mounted in suitable bearings 23. The worm shaft 22 is preferably formed in two sections, one of said sections being disposed in each of the filters 5 and 6, said sections being connected by means of a suitable coupling 24. A head member 25 is also threaded upon the other end of the filter pipe 11 and is provided with a testing valve 26 whereby the material may be drawn off after passing through the filter and its condition observed. A suitable drain pipe 27 is threaded in the inner and outer walls of the casing to receive the fluid from the annular chamber 12 and discharge the same into a suitable reservoir or receptacle.

The heads 25 of the respective filter pipes 11 are arranged in opposed relation and are connected by means of a pipe 28 in which the valves 29 are arranged to control the passage of the composition from one filter to the other. This pipe is also preferably formed in two sections centrally connected by means of a suitable union or coupling 30.

It will be understood that the supply

pump may be connected to either of the filters and the material passed therethrough in either direction as conditions may necessitate. By means of the apparatus above described my improved process is carried out in the following manner. The valves 29 are first closed and the composition is fed by means of the pressure pump to one of the filters. As this material is forced through the tubular straining cloth 16, its movement is somewhat retarded by means of the annular metal members 18 and as said material accumulates in the filter, considerable pressure is exerted by the compact mass against the walls of the straining cloth. Water or a similar cooling agent is admitted to the annular chamber 8 of the casing 5 which acts to precipitate the scale matter in the composition so that the fluid may freely separate therefrom and pass through the straining cloth, the apertures of the member 14 and through the openings in the pipe 11 into the chamber 12 from which it is drawn off into a suitable reservoir as previously explained. After the paraffin matter has accumulated to a sufficient extent within the first of said filters, the valves 29 are opened so that this matter may pass from one filter into the other. To the annular chamber 8 of this second filter, steam, hot water or a similar heating agent is supplied and continuously circulates therethrough. Rotation is imparted to the worm shaft 22 by any suitable means and the compact mass of paraffin matter is forced from the first filter into said second filter where it is subjected to the action of the heating agent. Thus as the scale matter is forced through this second filter by the worm shaft, the oils contained therein may be readily expressed from the scale through the straining cloth and perforated member 14 to the annular receiving chamber 12. The pressure in the first filter is maintained at from 200 to 300 pounds per square inch, and in the second casing the pressure is from 500 to 600 pounds per square inch, said pressures varying of course in accordance with the condition of the matter to be acted upon.

From the above it will be seen that when the valve 29 is closed, the passage of the distillate from the first filter wherein the same is cooled into the second filter is resisted so that the pressure of the worm shaft becomes effective. The paraffin is pumped through the pipe 20 into the first of the filters where it is subjected to the action of the cooling agent and a portion of the oil expressed therefrom as the paraffin accumulates within the pipe 11. When the pipe 11 in the first filter becomes entirely filled with the paraffin so that sufficient pressure is secured to express a part of the oil therefrom, the valve 29 is opened and the worm shaft forces the paraffin from this first filter through the pipes 28 into the second filter where it is subjected to the action of the heating agent. The residue of oil contained in the paraffin is withdrawn by the melting or liquefaction of the paraffin scales which is effected by the high temperature maintained in the second filter and also increases the pressure upon the moving mass of distillate. Thus when the paraffin is finally discharged, the same is substantially dry or free of the contained oil. In this manner a continuously moving mass of the paraffin is maintained from one filter to the other so that the same is not subjected to the action of the atmosphere in its passage from one filter to the other.

After the flow of the material through the filters 5 and 6 has been started, the valve 29 at the outlet end of the filter 6 is partially closed so as to check the flow of the material in said latter filter. It will be understood that the movement of the matter through these filters is comparatively slow, and this checking of the flow at the outlet of the filter 6 causes a further decrease in the speed of movement of the matter through said filter with respect to the movement in the filter 5. It will thus be apparent that the composite mass becomes closely packed in the filter 6 and is subjected to greater pressure than the material in the filter 5. After a predetermined length of time, and before the material has increased in density in the conduit 28 and the filter 5, the valve 29 at the outlet of the filter 6 is again opened so that the compressed material may be forced therefrom. When a normal flow is again established, the above operation is repeated.

By means of my process and apparatus therefor, as above described, it will be readily seen that the oil is extracted from a continuously moving mass of the composite matter and by alternately cooling and heating said mass, the oil is more efficiently and thoroughly expressed therefrom so that when the material is finally drawn off, the scale is in an extremely dry state. This dry scale is useful for various commercial purposes. The condition of the matter passing through the filters may be examined at any time by simply opening the valves 26 and drawing off a portion thereof.

The apparatus necessary in carrying out my improved process may be inexpensively constructed, and while I have set forth a particular construction and arrangement of the parts it will be obvious that the process forming the subject matter of this application is not necessarily limited to such specific construction of the filtering members.

The specific construction of the filters whereby the fluid is extracted from the composite matter forms no part of the present application, the same being described in

detail and claimed in my prior Patent 1,054,839, dated March 4, 1913.

Having thus described the invention what is claimed is:—

The hereindescribed process for expressing fluids from paraffin compositions which consists in continuously forcing the composite matter in a semi-fluid state between and through two filters arranged in spaced relation, and varying the rapidity of the flow of the composite matter through said filters whereby the matter will remain for a longer period of time in one filter than in the other, said matter being subjected to the action of a cooling agent during its movement through the first filter wherein the fluid is partially expressed, and to the action of a heating agent during its slower movement through the latter filter wherein said matter is under an increased pressure to extract the residue of fluid contained therein.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JULIUS HANSEN.

Witnesses:
C. H. LAWRENCE,
A. E. NEWMAN.