68 TEXTILES, FLUID
DRAFTSMAN.

No. 870,655. PATENTED NOV. 12, 1907.

L. P. WILLSEA.

CENTRIFUGAL MACHINE.

APPLICATION FILED JAN. 8, 1906.

FIG. 1.

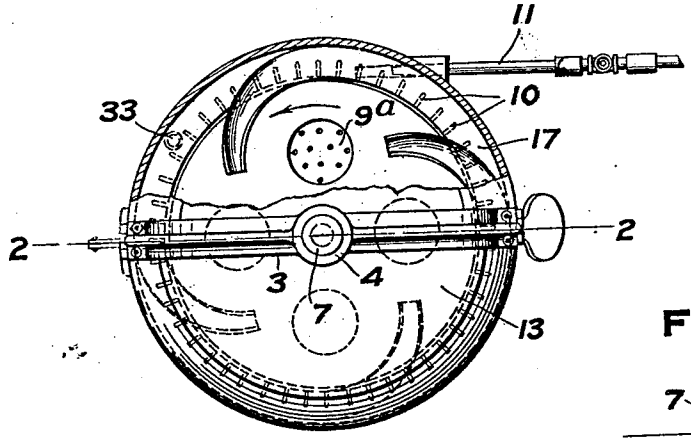


FIG. 3.

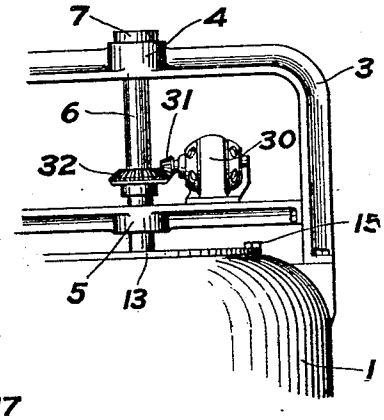
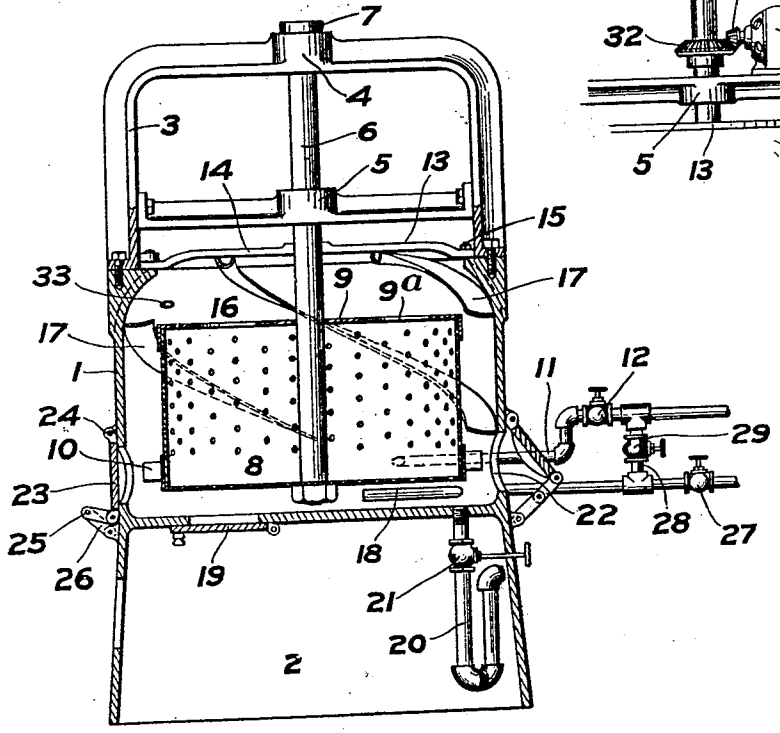


FIG. 2.



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TEXTILES, FLUID TREATING APPARATUS
DRAFTSMAN

UNITED STATES PATENT OFFICE.

LOUIS P. WILLSEA, OF ROCHESTER, NEW YORK.

CENTRIFUGAL MACHINE.

No. 870,655. Specification of Letters Patent. Patented Nov. 12, 1907.

Application filed January 8, 1906. Serial No. 295,196.

To all whom it may concern:

Be it known that I, LOUIS P. WILLSEA, a citizen of the United States, and a resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Centrifugal Extractors and Washers, of which the following is a specification.

This invention relates to centrifugal extractors and washers, and consists in the mechanism hereinafter described and claimed.

The object of the invention is to provide a simple and efficient mechanism for this purpose.

The device is intended particularly for extracting the oil from oily waste, and then for washing and drying the said waste.

In the drawings:—Figure 1 is a top plan view partly in section of a device embodying this invention; Fig. 2 is a vertical section on the line 2—2 of Fig. 1; except that the upper frame work is shown in elevation; and Fig. 3 shows a mode of driving the cage of the device by direct transmission from an electrical motor.

In the drawings the device is provided with an exterior casing 1 supported on a suitable standard 2, and carrying above said casing a frame work 3 having shaft bearings 4 and 5. In these bearings is the vertical shaft 6 supported by the flange 7 resting upon the upper bearing 4. The shaft 6 carries at its lower end the perforated cage 8, having the removable top 9. Upon rotating the shaft 6 and the cage 8 at the proper speed, it is clear that the fluids in the interior of the cage will, in the usual manner, be extracted from the solid substances, and the said fluids will pass out of said cage into the casing 1.

The cage is adapted to be revolved in any suitable manner, as, for instance, by the steam or water turbine mechanism shown in Figs. 1 and 2. On the exterior of the cage 8 are a series of vanes 10, against which a tangential jet of steam or water may strike for revolving the cage. In the present instance, the steam or water is brought in through the wall of the casing 1 by the pipe 11 controlled by the cock 12.

The casing 1 above the cavity containing the cage 8 is closed by a cover 13 that is split on the line 2—2, Fig. 1, and can be removed, so as to give access to the interior of the casing 1, for inserting and removing materials from the cage 8. The cover 13 is held in place by bolts 15 to close the cage chamber. The walls of the cage chamber 16 are above the cage curved inward, as shown, so that the casing 1 has a dome shaped top. One or a series of spiral curved conductors 17 are attached to the interior walls of the casing 1 and lie against the inner surface of the dome shaped top. These conductors, as more clearly shown in Fig. 2, extend to near the bottom of the cage, and by reason of the revolution of fluid in the casing in the direction of the arrow the fluid passes upward along said conductors until it emerges from their upper ends. These upper ends are curved inward toward the axis and extend over the top of the cage, and the fluid that flows up said conductors will, therefore, fall back upon the top of said cage. The upper portions of the conductors have a more pronounced trough shape than the lower portions thereof, as shown in Fig. 2. Into the lower part of the cage chamber 16 is brought a water pipe 18, and the bottom of said cage chamber is provided with a suitably covered hand hole 19, and with a trapped outlet pipe 20 controlled by a cock 21. A steam outlet 33 is provided from the upper part of the casing 1.

Through the bottom of the side walls of the casing 1 are one or more openings 22 covered and adapted to be closed by the covers 23 that are hinged at 24 to the outer surface of the casing 1. The covers from their lower edges are connected to the casing 1 by two locking links 25 and 26, pivoted to each other in the middle, and one pivoted to the cover 23 and the other to the casing 1. These links are of such proportion that when the cover 23 is closed upon the opening 22, the links automatically, by a toggle action, lock the cover closed.

The water pipe 18 is controlled by a valve 27, and the steam or water pipe 11 is connected with the water pipe 18 by the cross connection 28, controlled by the valve 29, so that by adjusting the valves 12, 27 and 29 fluid may pass into the casing 1, either by the pipe 11 or by the pipe 18, or may be mixed in either pipe in the desired proportion. The cover 9 of the cage 8 may have a series of holes 9^a in it, in order to avoid the necessity of lifting the cover off the cage. Through these holes material to be treated may be inserted and withdrawn.

The operation of the device shown in Figs. 1 and 2 is as follows:—The cover 13 or a portion thereof being removed, the cage 8 is filled to the desired degree by the material to be treated. If it is oily waste, steam is let in through the pipe 17, and acting upon the vanes 10 causes revolution of the cage, and at the same time heats the oil waste. When the revolution reaches the necessary speed, the oil is, by the centrifugal action, driven out of the waste, and strikes the inner walls of the chamber 16 and passes out through the outlet pipe 20, together with the condensed water. After this action has proceeded as long as is deemed necessary and the oil is sufficiently extracted from the waste, a supply of water is let in through the pipe 18 and steam, or steam and water, are let in through the pipes 11 and 18, again causing revolution of the cage 8. Under proper circumstances the injected water may be soapy.

The contents of the cage will be thoroughly washed, and the wash water ascending the conductors 17 will be led over the top of the cage and will pour into the cage again, this action being caused by the revolution of the mass of water in the casing and causing a circu-

lation of the wash water through the material in the cage. The material in the cage may be rinsed by fresh water. Then, all water having been withdrawn from the cage by opening the cock 21, the material may be removed from the machine.

In some cases the cage may be revolved by a separate motor, so that the use of a steam turbine is obviated. In this case the vanes 10 may be retained in order to assist in producing rotation of the mass of water in the casing. For instance, a motor 30 is mounted on the frame of the machine, and drives the shaft 6 through both gears 31 and 32. In this case the revolution of the cage 8 may be continued until the material in the cage is completely dry, and in order to permit the inlet of air for this purpose, the covers 19 and 23 may be opened. These covers may also be opened to clean, and otherwise obtain access to the machine.

Material in the cage may in many cases be sufficiently dried by injecting a jet of dry steam through the steam inlet, and admitting air into the casing by any of the openings thereinto.

What I claim is:—

1. A centrifugal machine comprising an outer casing provided with a bottom and a cover closing the upper end of the casing, means for introducing the material to be treated into said upper end, a rotary perforated cage within said casing, and one or more spiral conductors upon the inner side of the said casing and having trough-shaped upper ends curved inwardly under the cover of the casing and discharging upon the upper side of the cage.

2. A centrifugal machine comprising a closed outer casing, a rotary perforated cage therein, a steam pipe and a water pipe entering the lower part of the casing, a short pipe connecting said steam and water pipes and valves in all three pipes, whereby water or steam or a mixture thereof may be discharged into the casing.

LOUIS P. WILLSEA.

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