

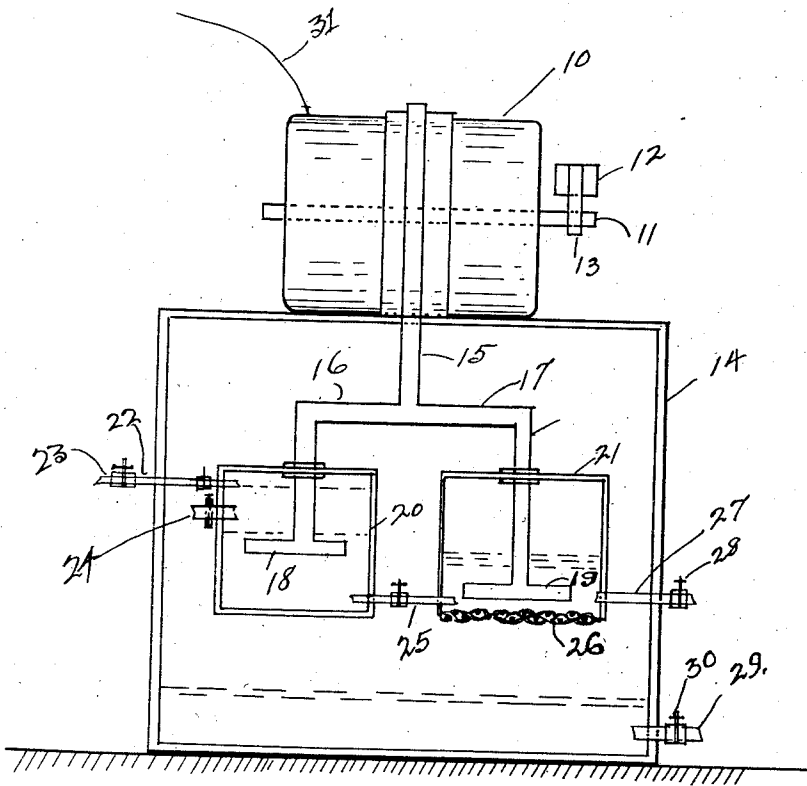
March 13, 1928.

1,662,180

J. P. BALL

APPARATUS FOR AND METHOD OF TREATING FLUIDS

Filed June 9, 1927



Inventor,
John P. Ball.

UNITED STATES PATENT OFFICE.

JOHN P. BALL, OF CHICAGO, ILLINOIS.

APPARATUS FOR AND METHOD OF TREATING FLUIDS.

Application filed June 9, 1927. Serial No. 197,648.

My invention relates to an improved method of treating fluids containing suspended matter, as for example sewage with its suspended bacteria and solids; the invention involving means for carrying out said method of treatment and separation.

The invention, as well as its objects and advantages, will be readily comprehended from the detailed description of the accompanying drawing which conventionally illustrates my improved apparatus in sectional elevation.

My invention involves the use of a suitable motor, preferably electrically operated and provided with a rotating shaft; the motor casing being conventionally shown at 10, with its armature shaft 11 shown extended at its end to the casing exterior.

My invention involves the use of effective vibrations, of what may be termed a rotary character, namely vibrations resulting from a high speed rotating element or shaft. The end of shaft 11 is therefore shown provided with a suitable eccentrically arranged weight indicated at 12, attached in any suitable manner to the shaft 11, as by the strap or band 13.

With the weight 12 mounted in the manner shown, the shaft 11 will be somewhat out of balance with the result, that operation or rotation of shaft 11 at high speed, will produce an increased amount of vibration.

It is obvious that the manner of securing the weight to the shaft may be effected in any suitable manner; or the manner of setting up excessive vibrations in the rotating shaft may be differently produced.

The motor 10 is shown mounted on a suitable closed receptacle or vessel 14 of any desired cross-sectional configuration, into which the depending rod 15 extends. The rod 15 is secured to the casing of the motor and may be in the nature of an encircling band preferably snugly fitting about the motor-casing so as to have all of the vibrations set up in the casing transmitted thereto.

The lower end of rod 15 is shown ramified to provide a plurality of arms or extensions 16, 17, which in turn preferably terminate in the enlarged or laterally disposed portions 18, 19.

The outer vessel 14 is intended to be of a size to properly contain a pair of smaller closed receptacles 20 and 21, mounted in any suitable manner intermediate of the top and

bottom of the outer receptacle 14, so as to provide a precipitation receiving chamber beneath said inner receptacles 20 and 21.

The depending ends of the arms of extensions 16, 17 are disposed, respectively, through suitable openings in the tops of the inner receptacles 20 and 21.

The crude liquid or fluid matter to be treated is initially introduced into receptacle 20 by means of pipe 22 which may be provided with a suitable valve as at 23 for controlling inflow; the introducing pipe 22 extending through the wall of vessel 14 and into the upper part of the inner receptacle 20. The liquid is then subjected to the more or less excessive vibrations induced by the unbalanced rotating shaft of the motor and transmitted thereto by the depending arm 16 with its enlarged or laterally disposed portion 18. This will induce a precipitation of the suspended solids and suspended bacteria; the supernatant liquid being withdrawn from receptacle 20 by means of a suitable draw-off pipe 24, which is also preferably provided with a suitable valve.

The precipitated matter with portions of the fluid or liquid in the bottom of the vessel are drawn off and transmitted into the second interior vessel 21 by means of a conduit or pipe 25. The liquid introduced into the receptacle 21 will again be subjected to the vibrations transmitted thereto by arm 17 which preferably is of somewhat longer form and extends into proximity to the bottom of receptacle 21; the bottom of receptacle 21 being in the nature of a fine mesh screen 26. The vibration producing arm 17 will induce a rapid precipitation of any precipitant or solid matter carried by the fluid introduced by the receptacle 21; the liquid being caused to percolate through the screen bottom 26 into the outer vessel 14; while the sludge or precipitate is withdrawn from receptacle 21 by means of the outlet pipe 27 which may be provided with a suitable valve as at 28. The percolated treated liquid may be drawn off from vessel 14 through suitable outlet pipe 29 preferably provided with a suitable valve as at 30.

Subjecting a fluid or liquid carrying suspended matter to vibrations produced by a high speed rotating member or shaft causes a rapid precipitation and thus permits the decanting or drawing off of the supernatant fluid in a comparatively brief space of time

after operations have begun; the method eliminating the use of elaborate series of receptacles as well as the saving of time in carrying on the operation.

5 For purposes of exemplification, I have conventionally illustrated a well known type of electric motor at 10 provided with the feed line or wire as shown for example at 31, but it will be understood that any motor adapted to produce high speed rotation of its shaft, with the shaft placed out of balance, may be employed and other modifications and refinements of the apparatus disclosed in the drawing may be made without, how-
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15 ever, departing from the spirit of my invention.

What I claim is:

1. Apparatus of the character described comprising a vessel provided with a control-
20 lable outlet adjacent to the bottom thereof, a pair of receptacles mounted within said vessel in spaced relation with the bottom thereof, one of said receptacles having a fluid introducing conduit adjacent to its top and
25 connected with the second receptacle by a conduit adjacent to the bottom thereof, said second receptacle being provided with a foraminated bottom, a high speed rotating ele-

ment mounted on said vessel, means for placing said high speed rotating element out of balance to induce vibration, and means intermediate of said high speed rotating element and said receptacles whereby the liquid therein is subjected to the vibration set up in said unbalanced high speed rotating
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35 element.

2. Apparatus of the character described comprising an outer vessel provided with a controllable outlet at bottom, a pair of receptacles mounted in the outer vessel in spaced relation with the bottom thereof, a conduit leading into one of said receptacles for introducing the fluid to be treated, a conduit for connecting the pair of receptacles adjacent the bottoms thereof, the second of said pair of receptacles being provided with a foraminated bottom while the first mentioned receptacle of said pair is provided with a controllable outlet for drawing off the supernatant fluid, an electric motor
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50 mounted on said outer vessel, means whereby the armature shaft of said motor is placed out of balance, and vibration transmitting means secured to said motor and extending into each of said pair of receptacles.

JOHN P. BALL.