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APPARATUS FOR SCREENING PASTES

Filed Aug. 26, 1929

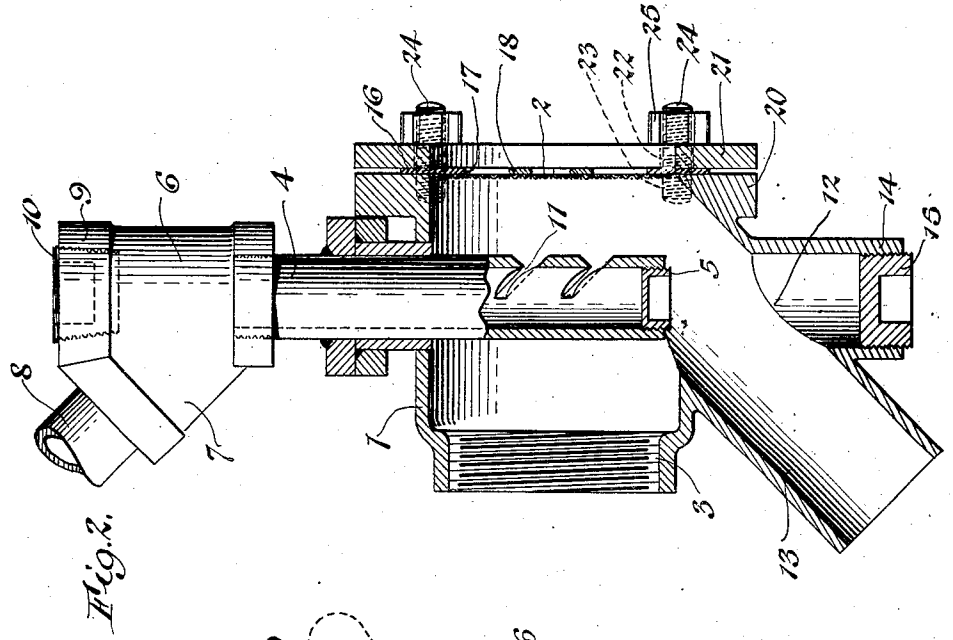


Fig. 2.

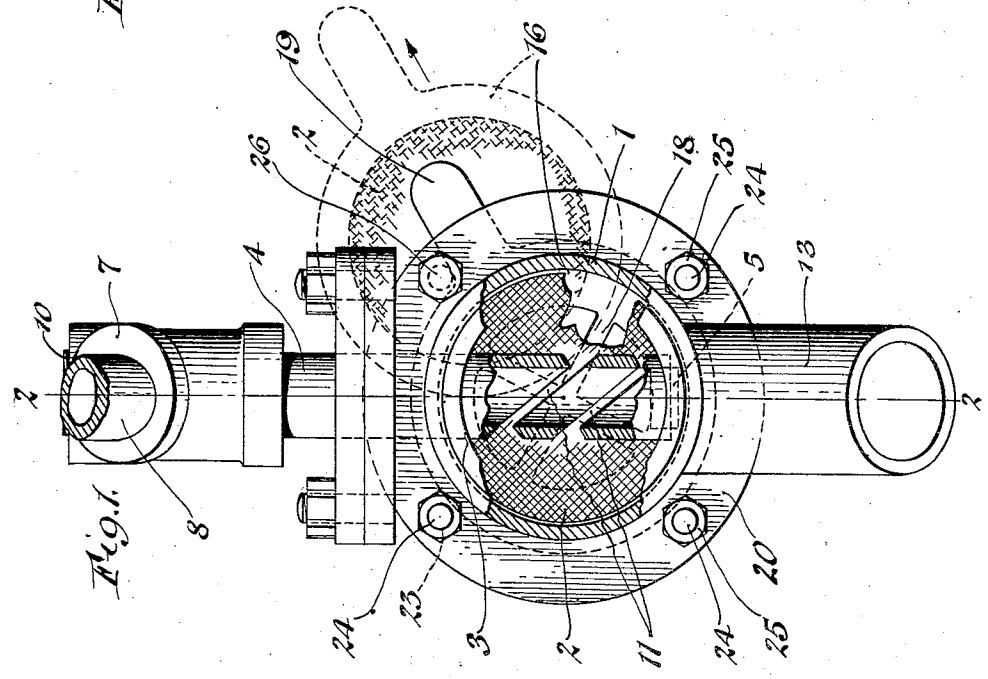


Fig. 1.

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APPARATUS FOR SCREENING PASTES

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The present invention relates to an apparatus for screening fluid materials such as dye pastes, etc., to remove lumps and grit and other foreign matter. The present invention is an improvement in the apparatus disclosed in the co-pending application of Robert O. Wood and Byron L. West, for apparatus for screening liquid materials, Serial No. 388,527, filed of even date herewith.

One of the objects of the present invention is to increase the capacity per unit of screen area of apparatus of the character herein described. Another object is the provision of a convenient arrangement and construction of parts to permit rapid assembly and disassembly for replacement, repair or cleaning. More particularly, the invention resides in certain improvements in construction and combinations of elements and arrangement of parts, all as exemplified in the following detailed disclosure and defined in the claims.

In the accompanying drawings wherein is disclosed a preferred embodiment of the invention, Figure 1 is a plan view partly in section, and Figure 2 is a sectional view along the line 2—2 of Figure 1.

Referring to the drawings, the apparatus comprises a cylindrical casing 1 having a screen 2 disposed across one end thereof, the other end 3 being open to provide a vent. A long L-shaped stand pipe (not shown) open at both ends may be secured in this vent to prevent loss of liquid therethrough, due to splashing, back pressure, etc. An inlet pipe 4 extends through the casing (shown in the drawings for the purpose of illustration as being at right angles to the axis of the casing) and is closed at its inner end during operation by the threaded plug 5. Threaded onto the inlet pipe 4 is the lateral coupling indicated generally by the numeral 6, to the branch 7 of which is joined the feed pipe 8 for feeding material to the apparatus. Branch 9 is in alignment with inlet pipe 4, and during operation is closed at its outer end by the threaded plug 10.

Inlet pipe 4 is provided with a plurality of semi-spiral lateral slots 11 cut into the wall of the pipe, which serve as nozzles and are so disposed as to direct an elongated stream of material against the screen. The provision of a multiplicity of streams impinging against the same screen, whereby the capacity of the screen is increased without increasing its area or the velocity of the streams, comprises one feature of the present invention. However, slots or nozzles of different shapes or structure may be employed.

At the opposite side of the casing is the lateral coupling 12, welded or otherwise secured to the casing 1, the branch 13 of which provides for the discharge of excess or run-off material from the screening chamber. The branch 14 is closed during operation by the threaded plug 15.

The foraminous member 2, which may be a wire screen of fine mesh, or cloth, is soldered, welded, or otherwise suitably secured to the annular disc 16, and covers the circular opening 17 therein. The screen may be braced by the strips 18 which are shown as being diametrically disposed at right angles across the circular opening in the disc, and integral with the disc. The bracing strips slightly increase the capacity of the screen in spite of the reduction of available screening area resulting from their use. However, other bracing means may be employed, or the braces may be dispensed with where unnecessary. A handle 19 shown as being integral with the disc 16 is provided for manipulating the disc.

The disc 16 is clamped in the casing between the end of the casing 20 and the ring 21, which is bored at 22 in alignment with the tapped holes 23 in the end of the casing. Three studs or dowels 24 are inserted or threaded into the end of the casing 20. The nuts 25 threaded onto the ends of the dowels or studs 24 and the cap screw 26 threaded into a tapped hole 23 retain the ring 21 and screen disc 16 in place. However, in place of the studs or dowels, cap screws may be used.

In operation, material to be screened enters inlet pipe 4, and, passing through the pipe, is discharged through the slots or nozzles 11 against the screen 2. In the construction shown in the drawings, these apertures are adapted to direct the stream of material at

an angle of about 45° against the screen but this angle may be varied. Fine material, for the most part, passes through the screen and may be collected by suitable means not shown. Coarse or run-off material which does not pass through the screen is discharged through the exit pipe 13 and may be recirculated by suitable means, not shown. The vent 3 provides access of air to the interior of the screen chamber and serves to maintain the air pressure equal on both sides of the screen to avoid filtering action.

The screen may be removed for replacement, repair or cleaning, etc., in a simple manner. Nuts 25 are loosened slightly, cap screw 26 is removed and, grasping the screen disc handle 19, the operator may withdraw the disc without removing the clamping ring 21, as shown in dotted lines in Figure 1. The disc may be replaced in a similar manner by inserting it between the ring 21 and casing end 20, tightening the nuts 25 and inserting and tightening the cap screw 26. Removal of the plugs 10, 15 and 5 and of the screen and vent pipe, renders the interior of the apparatus readily accessible for cleaning with a rod or brush.

It will be readily apparent that the improvement herein described exemplifies one means for accomplishing the objects set forth above. Various changes may be made in the specific details of construction and design of the apparatus without departing from the invention as defined by the appended claims.

I claim:

1. An apparatus of the character described comprising a casing having a plurality of threaded studs projecting from one end thereof and being tapped to receive a bolt, an annular plate having openings therein aligned with the studs and tapped bore to adapt it to fit over the end of the casing, a screen clamped between the plate and casing end, nuts threaded on the ends of the studs and a bolt threaded into the tapped bore of the casing to clamp the screen in position, means for introducing material to be screened into the casing, means for directing the material to be screened against the screen under a velocity head, means for removing run-off material and means for equalizing air pressures on the inside and outside of the casing.

2. An apparatus of the character described comprising a chamber having a foraminous member and having inlet and outlet openings on the same side of the member, means for projecting a stream of liquid to be screened directly against said member, said means comprising a tube having a plurality of apertures in its wall, and means for equalizing air pressure on the two sides of said member.

3. An apparatus of the character described comprising a hollow cylindrical casing having a foraminous member across one end thereof, an inlet tube extending parallel to said member, an outlet member diametrically opposite the inlet tube comprising a lateral coupling having one branch in alignment with said inlet tube, a lateral coupling on the exterior end of said inlet tube, a removable plug closing the exterior end of said aligned branch of the outlet member, and removable plugs closing the interior end of inlet tube and the aligned branch of its lateral coupling.

4. Apparatus of the character described comprising a cylindrical casing having a plurality of tapped holes in the end thereof, an annular plate having holes therein in alignment with the tapped holes of the casing and adapted to fit over the end of the casing, a screen clamped between the plate and casing end, threaded means comprising at least one cap screw for clamping the plate and screen in position, means for causing material to impinge against the screen in the casing, means for removing run-off material from the casing, and means for equalizing air pressures on the inside and outside of the casing.

5. A screening apparatus comprising a casing, an annular plate adapted to fit over one end of said casing, a foraminous member clamped between said plate and the end of said casing, a tube leading into said casing, a plurality of nozzles in the wall of said tube, adapted to project a material to be screened directly against said foraminous member and an outlet from said casing.

6. A screening apparatus comprising a hollow cylindrical casing, a screen across one end thereof, an inlet tube extending parallel to said screen, slots in the wall of said tube opposite said screen adapted to project a material to be screened directly against said screen and an outlet tube angularly disposed with respect to said screen.

7. A screening apparatus comprising a hollow cylindrical casing, a foraminous member across one end thereof, an inlet tube extending parallel to said member, nozzles in the wall of said tube opposite said member of an area sufficient to discharge against the entire screen and an outlet tube in said casing.

8. An apparatus comprising a hollow cylindrical casing, a screen across one end thereof, an inlet tube extending parallel to said screen, nozzles in the wall of said tube adapted to direct streams of material angularly against said screen, an outlet and an air vent in said casing.

9. In a screening apparatus comprising a casing, a screen, and an inlet and an outlet in said casing, a tube passing through said inlet, the wall of said tube having a plurality of semi-spiral lateral slots cut therein.

10. An apparatus of the character described comprising a chamber having a foraminous member and having inlet and outlet openings on the same side of the member,

means for directing a stream of material against said member, said means comprising a tube having a plurality of uniformly spaced apertures in its wall adapted to discharge against substantially the entire surface of the foraminous member.

In testimony whereof I affix my signature.

IRVING T. THORNTON.