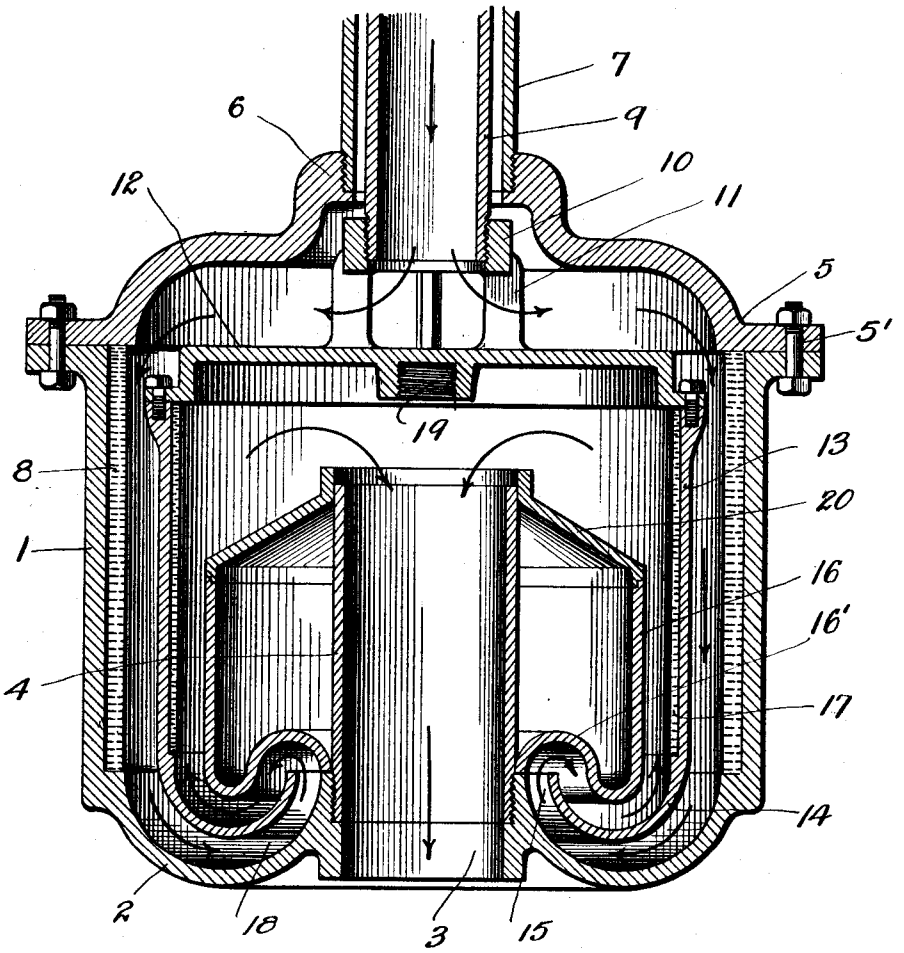
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1,530,759

W. C. COLEMAN

CENTRIFUGAL MACHINE

Filed Oct. 8, 1923



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UNITED STATES PATENT OFFICE.

WILLIAM C. COLEMAN, OF WICHITA, KANSAS.

CENTRIFUGAL MACHINE.

Application filed October 8, 1923. Serial No. 667,202.

To all whom it may concern:

Be it known that I, WILLIAM C. COLEMAN, a citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Centrifugal Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to centrifugal separators and the primary object is to provide a novel form of separator whereby ore sludge or pulp containing minerals may be treated to separate the minerals from the ore. I have shown the device as adapted to contain mercury which has an affinity for certain metals.

This invention is shown as comprising two mercury containing rotors, one within the other and arranged concentrically, the construction being such that material may enter the outer rotor to contact with the mercury and then enter the inner rotor where it is again subjected to the action of mercury and then discharged through an outlet in the outer rotor.

The construction of the invention will be clearly apparent by reference to the following description in connection with the accompanying drawing, in which—

The figure is a vertical, longitudinal, sectional view through the preferred form of my invention.

Referring now to the drawings by numerals of reference:

The outer rotor 1 has a cylindrical wall provided at its lower edge with a curved bottom 2 having a central opening 3 surrounded by an upstanding collar 4. The top edge of the outer rotor carries a cover plate 5 having a central opening provided with a collar 6 to which is attached a shaft 7 to drive the outer rotor.

The inner face of the wall of the rotor receives an annular column of mercury 8 to act upon the material entering the separator. Within the shaft 7 is a hollow shaft 9 fastened to the collar 10 on the spider 11 carried by the disk 12 of the inner rotor.

Fastened to the disk 12 is a downwardly extending wall or flange 13 having an inwardly and upwardly curved extension 14 forming a central opening 15 through which the collar 4 projects. The collar 4 carries a deflecting drum 16 having a concave bottom 16′ to direct material in proximity to the inner face of the inner rotor 13. The inner rotor carries an annular body of mercury 17 as shown.

The material may enter the machine through the hollow shaft 9 and pass out through the openings in the spider 11, flow radially on the disk 12 to contact with the body of mercury 8, then pass downwardly and upwardly through the opening 15 and be subjected to the action of the body of mercury 17 and then flow through the opening 3. The material, therefore, will be subjected to the action of mercury in both rotors, there being a time element thus provided which will insure at least the major portion of the metal being removed from the pulp or sludge.

The cover plate 5 may be secured to the member 1 by fastening devices, such as bolts 5′.

It will be observed that the curved portion 14 at the lower end of the wall 13 gradually emerges toward the curved bottom 2 so as to provide a progressively decreasing passageway 18 through which the material passes before it is directed by the curved portion 16′ in a return direction into the space between the drum 16 and the mercury 17. I have found that such an arrangement prevents accumulation or clogging of the passageway during the operation of the machine and I therefore recommend that the curved portion 14 be so constructed that the space adjacent to its outlet be slightly less in cross section than the space between 13 and the mercury 8, as in actual practice this gives better performance.

In some instances I may arrange the units in series. In that event the cover plate 5 for the lower unit will be removed and the lower unit will be fastened to the upper unit in any appropriate manner so that both upper and lower units may rotate together and the disk in the lower unit will be fast to its complementary disk 12 in the upper unit by a double threaded rod engaging the boss 19 in 12 and a similar boss on top of the disk in the lower unit. This construction is obvious however and so it is thought

that it is not necessary to illustrate it in this application, mention being made of such a construction however to disclose the fact that it is possible to duplicate the units and drive them from a single drive mechanism.

It will be obvious from the foregoing that the material will enter the machine through the hollow tube or shaft 9 where it will be thrown radially or distributed by the disc 12 so it will first come into contact with the lower mercury 17 then being directed against the mercury 17 by the drum baffle 16 and finally discharged over the upwardly inclined top 20 of the drum so it may be finally discharged through the outlet 3.

What I claim and desire to secure by Letters-Patent is:

1. A centrifugal separator comprising two concentric rotors, each containing a body of mercury, means for feeding material into the outer rotor, means for discharging it from the outer rotor to the inner rotor, and means for discharging the material from the inner rotor through the outer rotor to exhaust.

2. A centrifugal separator comprising two concentric rotors having means for independently operating them, means for feeding material into the outer rotor, means for discharging the material from the outer rotor into the inner rotor, and means for discharging the material from the inner rotor.

3. A centrifugal separator comprising two concentric members, the outer member having an annular wall and an inwardly and upwardly curved bottom, the inner member having an annular curved wall and an inwardly and upwardly curved bottom, the inner member having a central opening to receive material from the outer member and the outer member having a discharge collar extending about the bottom of the inner member through which the material may be discharged from the inner rotor.

4. A centrifugal separator comprising two concentric members, the inner member having a tubular inlet and comprising a spreader disk and a depending wall having an inwardly curved extension at its lower end with a central opening, and the outer member having a central opening surrounded by a collar projecting above the lower wall of the inner member, the collar being of less diameter than the opening in the inner member.

5. A centrifugal separator comprising two concentric members, each containing a body of mercury, means for feeding material to the outer member, means for discharging it from the outer member to the inner member and a drum-shaped baffle within the inner member for directing material through the inner member to exhaust.

6. A centrifugal separator comprising two concentric members, each containing a body of mercury, means for feeding material to the outer member, means for discharging it from the outer member to the inner member and a drum-shaped baffle within the inner member for directing material through the inner member to exhaust, the drum-shaped baffle being carried by the outer member.

7. A centrifugal separator comprising two concentric members, each containing a body of mercury, means for feeding material to the outer member, means for discharging it from the outer member to the inner member, said means having a gradually reduced passageway toward the discharge and a drum within the inner member having a concave bottom adjacent to the second mentioned means, said drum constituting a directional baffle for directing the material against the mercury in the second mentioned member, one of the members having an exhaust port through which the material may finally pass.

In testimony whereof I affix my signature.

WILLIAM C. COLEMAN.