E. H. LUTZ & E. J. SHEDA.

SLIME FILTER.

APPLICATION FILED MAR. 1, 1910.

983,735.

Patented Feb. 7, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

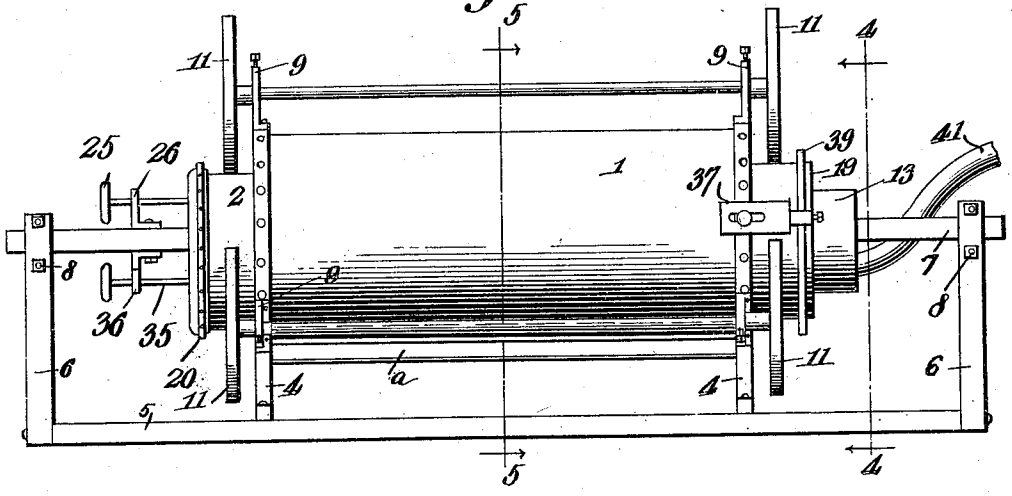


Fig. 6.

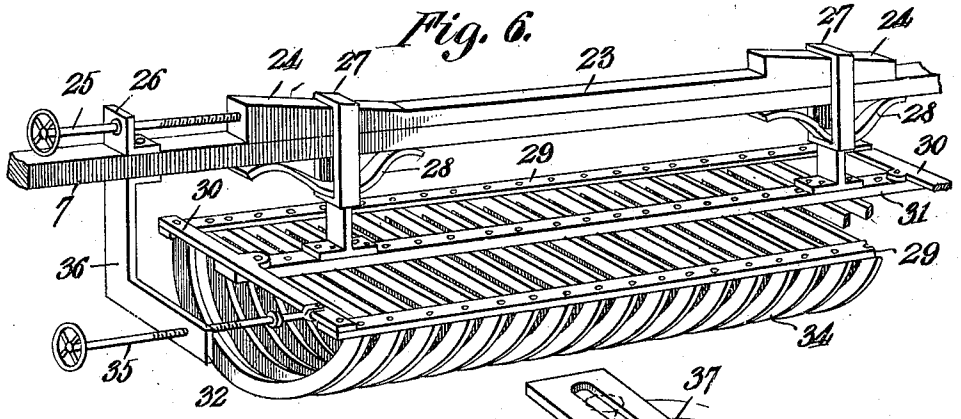


Fig. 8.

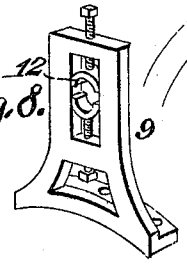


Fig. 9.

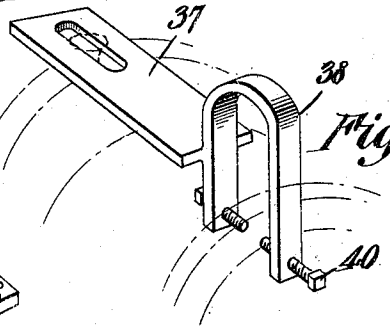
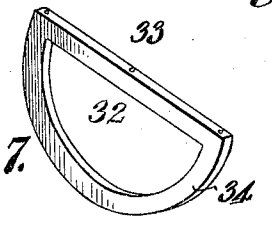


Fig. 7.



Witnesses

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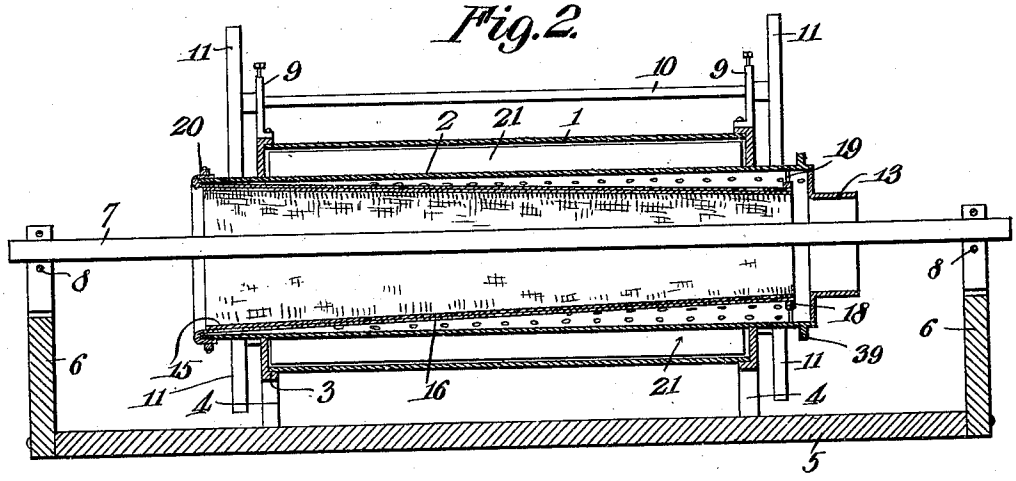
3 SHEETS—SHEET 2.

Fig. 2.



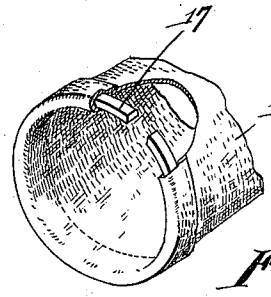


Fig. 11.

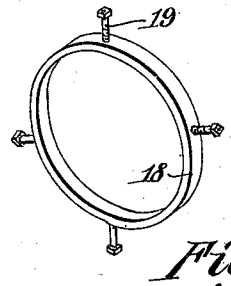


Fig. 12.

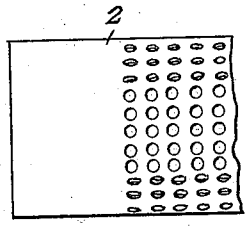


Fig. 13.

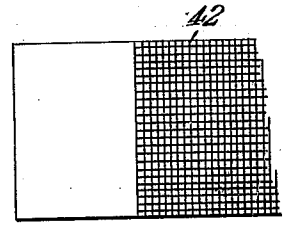


Fig. 14.

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3 SHEETS—SHEET 3.

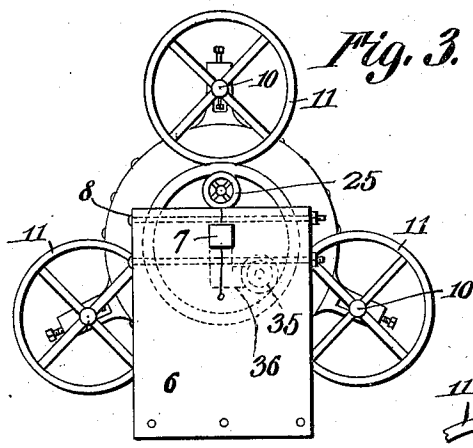

Fig. 3.

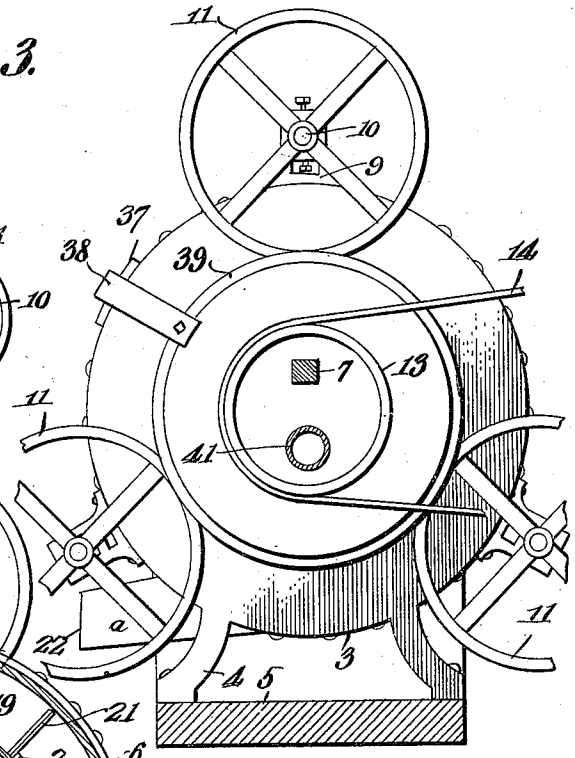

Fig. 4.

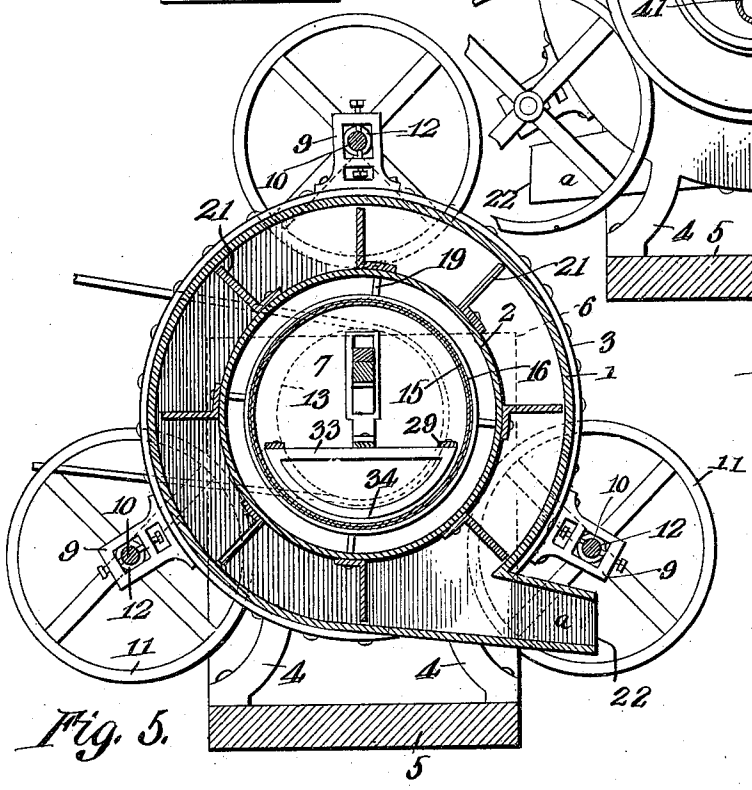

Fig. 5.

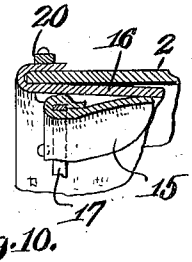

Fig. 10.

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UNITED STATES PATENT OFFICE.

ELVIN H. LUTZ, OF HAY SPRINGS, NEBRASKA, AND EDWARD J. SHEDA, OF DENVER, COLORADO.

SLIME-FILTER.

983,735. Specification of Letters Patent. Patented Feb. 7, 1911.

Application filed March 1, 1910. Serial No. 546,687.

To all whom it may concern:

Be it known that we, ELVIN H. LUTZ and EDWARD J. SHEDA, citizens of the United States, residing, respectively, at Hay Springs, in the county of Sheridan and State of Nebraska, and Denver, in the county of Denver, State of Colorado, have invented new and useful Improvements in Slime-Filters, of which the following is a specification.

The purpose of the present invention is the provision of a machine which may be used either for filtering or classifying slimes, or for both, said machine operating both by centrifugal and scraping action.

The apparatus embodies in its organization a stationary drum having a lateral discharge, a separating or filtering cylinder rotatably mounted within the drum and provided upon its exterior with blades or paddles to create an outward suction through said cylinder, peculiar mountings for the cylinder to reduce the friction to the smallest amount possible, a scraper suspended within the said separating or filtering cylinder, means for adjusting the relative height or distance of the scraper elements to a greater or less pitch with reference to the rotation of given elements of the cylinder so as to regulate the feed of the material through the cylinder.

The invention also contemplates a peculiar formation of filtering cylinder embodying concentric tubes or textile of different mesh and texture to effect a thorough separation of the water from the solid particles.

A further purpose of the invention is to provide a scraper embodying a plurality of approximately semi-circular scraper elements arranged in parallel position and pivotally connected to a frame having an approximately parallelogrammatic movement whereby the several scraper elements may be relatively inclined to regulate the amount of material fed through the machine in a given time.

The invention also further consists of the noval features, details of construction and combinations of parts which hereinafter will be more particularly set forth, illustrated and finally pointed out in the subjoined claims.

Referring to the accompanying drawings forming a part of the specification: Figure 1 is a view in elevation of a machine of the character aforesaid embodying the invention. Fig. 2 is a vertical central longitudinal section thereof. Fig. 3 is a view of the machine as seen from the discharge end. Fig. 4 is a section on the line 4—4 of Fig. 1 looking in the direction of the arrows, showing the parts on a larger scale. Fig. 5 is a transverse section on the line 5—5 of Fig. 1 looking in the direction of the arrows showing the parts on a larger scale. Fig. 6 is a perspective view of the scraper and the suspending and adjusting means coöperating therewith. Fig. 7 is a perspective view of one of the scraper elements. Fig. 8 is a perspective view of one of the bearings adjustably supporting the shafts provided with the cylinder separating pulleys. Fig. 9 is a detail perspective view of the means for adjusting the filtering or separating cylinder with reference to the drum. Fig. 10 is a detail view of the means for connecting the textile tubes to each other and to the cylinder. Fig. 11 is a perspective view of an end portion of a textile tube showing the hem in which a spring arm is fitted. Fig. 12 is a perspective view of the ring connecting one end of the textile tubes, to the corresponding end of the cylinder. Fig. 13 is a view in elevation of an end portion of the cylinder. Fig. 14 is a view in elevation of an end portion of a separating cylinder.

Corresponding and like parts are referred to in the following description and pointed out in the several views of the drawings by the same reference characters.

The apparatus comprises a drum 1 which is suitably mounted and is provided at opposite ends with centrally apertured heads or inner flanges so as to close the annular space formed between the drum and the cylinder to locate centrally within the drum and mounted to have a rotary movement imparted thereto. Standards support the drum and are located at or near the ends thereof and each standard consists of a ring 3 and feet 4, the latter forming a part or attached to the ring in any manner.

A suitable framework is provided for supporting the coöperating parts and consists of a base 5 and uprights 6. The standards supporting the drum 1 are secured to the base 5 in any substantial way. A bar 7 of angle formation in transverse section is supported at or near its ends by means of the uprights 6, the latter being split at their upper ends and having the separated parts

by means of a swivel joint thereby admitting of the free rotation of the set screw when it is required to adjust the scraper.

Longitudinal movement of the cylinder 2 within the drum 1 is prevented by means of a plate 37 which is adjustably connected to one of the standards and provided at its outer end with a yoke 38 which straddles an annular flange 39 secured to an end portion of the cylinder 2. Each member of the yoke 38 is provided with a set screw 40 constituting an adjustable stop to engage with a side of the flange 39 and forming a guide to hold the cylinder in the required adjusted position. The set screws 40 admit of adjusting the distance between their inner ends to correspond to the thickness of the flange 39 and thereby prevent any longitudinal play of the cylinder.

In the practical operation of the machine or apparatus, the slimes or other material to be separated are fed into one end of the cylinder by means of a pipe 41, the latter extending through the hollow pulley 13. The cylinder being rotated rapidly, the blades or paddles 21 create an outward suction through the filtering tubes and cylinder thereby effecting a rapid separation of the water from the solid matter, said water discharging from the drum through the outlet 22. The solid matter is collected within the filtering tube and is advanced therethrough and discharged therefrom by means of the scraper which latter in this capacity performs the dual office of a scraper, and a feeder. By varying the inclination of the scraper elements the material may be advanced through the filtering tube more or less rapidly according to conditions and the nature of the material to be separated.

It will be observed that the scraper may be adjusted vertically and the angle of the scraper elements varied at will without stopping the machine both adjustments being effected from the outside, by means so positioned as not to interfere with the operation of the machine, hence, the work may progress and the adjustments accomplished.

It is to be understood that when the machine is to be adapted as a classifier, the filtering tubes may be disposed with a cylinder 42 substituted for the cylinder 2, the mesh or openings of the separating or qualifying cylinder being of any size according to the classification or result to be effected. The meshes of the classifying or separating cylinder may be prevented from clogging by suitably arranged brushes or cleaner elements in the manner well understood, said cleaner elements being used either in conjunction with scraper elements or separately therefrom. When both scraper elements and brushes are used it is proposed to dispose the same in alternation.

Having thus described the invention, what is claimed is—

1. In apparatus for separating ore, the combination of a relatively fixed drum, a cylinder rotatably mounted within the drum and having openings in its sides and adapted to receive material at one end and to discharge the same at the opposite end, and paddles attached to the said cylinder and rotatable therewith in the space formed between the cylinder and drum.

2. In apparatus for separating ore, the combination of a relatively fixed drum provided with an outlet at one side, and a separating cylinder rotatably mounted within the drum and adapted to receive the material at one end and to discharge the same at the opposite end, the space between the cylinder and drum being closed at its ends, blades attached to the cylinder and rotatable therewith in the space formed between the cylinder and drum, and means for fixing the position of the cylinder within the drum.

3. In apparatus for separating ore, the combination of a relatively fixed drum provided with an outlet at one side, and a separating cylinder rotatably mounted within the drum and adapted to receive the material at one end and to discharge the same at the opposite end, the space between the cylinder and drum being closed at its ends, blades attached to the cylinder and rotatable therewith in the space formed between the cylinder and drum, means for fixing the position of the cylinder within the drum, said means consisting of a flange upon a projecting end of the cylinder, a yoke having connection with the drum, and set screws mounted in the members of the yoke and adapted to engage opposite sides of the said flange.

4. In apparatus for separating ore, the combination of a relatively fixed drum, a separating cylinder rotatably mounted within the drum and having end portions extending beyond ends of the drum, a series of brackets arranged about the drum and provided with adjustable bearings, longitudinal shafts mounted in said bearings, and pulleys at the ends of said shafts and engaging with the projecting ends of the cylinder and forming supporting means therefor.

5. In apparatus for separating ore, the combination of a perforated cylinder, a flexible filtering tube arranged within the cylinder, one end of the flexible tube being spaced from the cylinder and the opposite end of the filtering tube touching the said cylinder, a ring attached to the spaced end of the filtering tube, and stay bolts adjustably connecting said ring with the cylinder.

6. In apparatus for separating ore, the combination of a cylinder, a scraper arranged within the cylinder, a suspension

bar supporting the scraper, hangers supporting the scraper from said suspension bar, and means for adjusting the scraper vertically.

7. In apparatus for separating ore, the combination of a cylinder, a scraper arranged within the cylinder, a suspension bar supporting the scraper, hangers supporting the scraper from said suspension bar, a bar movable upon the suspension bar and provided with cam portions engaging the hangers, and means for adjusting said movable bar to effect vertical adjustment of the scraper.

8. In apparatus for separating ore, the combination of a cylinder, a scraper arranged within the cylinder, a bar forming supporting means for the scraper, hangers supporting the scraper in suspension from said bar, a second bar provided with cam portions coöperating with said hangers, and means for adjusting said second bar longitudinally to effect vertical movement of the scraper.

9. In apparatus for separating ore, the combination of a cylinder, a scraper arranged within the cylinder, a bar extending through the cylinder, hangers connected at their lower ends with the scraper and having loops at their upper ends to receive said bar, springs interposed between the lower ends of the loops and the said bar to press the scraper downward, a second bar mounted upon the scraper supporting bar and passing through the loops of the hangers, and means for adjusting said second bar longitudinally to effect vertical movement of the scraper.

10. In apparatus for separating ore, a scraper comprising parallel bars and scraper means pivotally connected to said parallel bars, and means for moving the parallel bars to change the angle of the scraper elements.

11. In apparatus for separating ore, the combination of a bar, other bars located upon opposite sides of the first-mentioned bar and parallel therewith, end bars having pivotal connection with the several bars, and transversely disposed scraper elements having pivotal connection with the several bars and adapted to have their relative inclination adjusted by movement of the outermost longitudinal bars.

12. In combination, a cylinder, a bar extending through the cylinder, hangers supported by said bar, a frame suspended by means of said hangers and having a parallelogrammatic movement, scraper elements pivotally connected with the longitudinal bars of said frame, means for adjusting the frame, and other means for imparting a parallelogrammatic movement to the said frame to adjust the relative inclination of the scraper elements.

In testimony whereof we affix our signatures in the presence of witnesses.

ELVIN H. LUTZ.
EDWARD J. SHEDA.

Witnesses:
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H. H. HILL,
F. G. MUSGROVE,
M. J. DAVIS.