

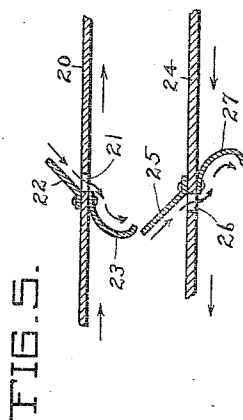
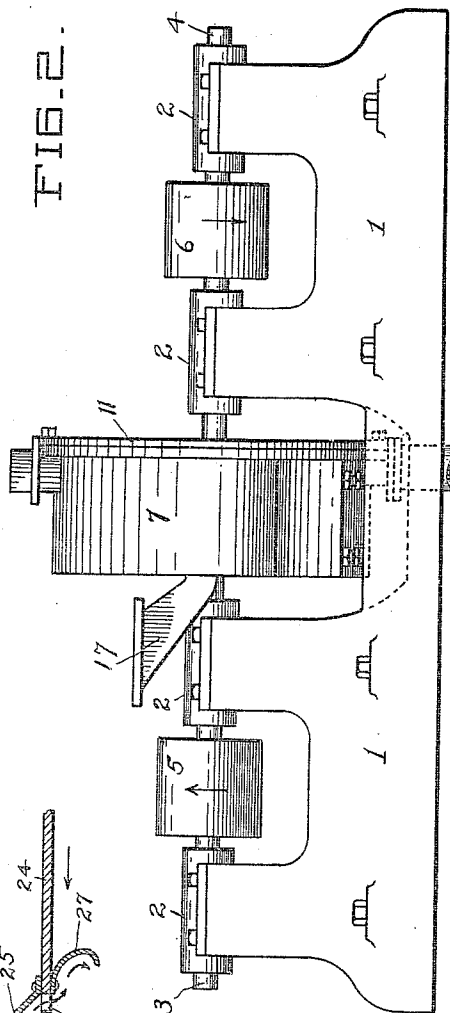
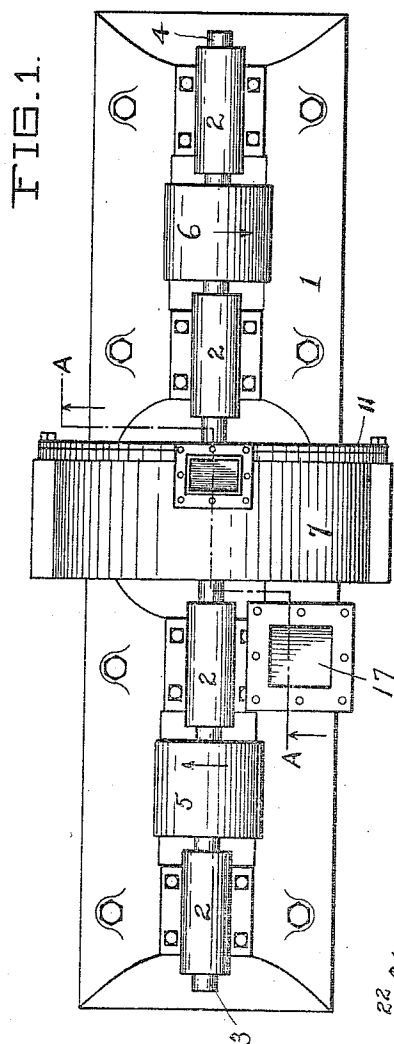
J. HEINZ.
 ABRADING MACHINE.

APPLICATION FILED AUG. 5, 1907. RENEWED FEB. 9, 1910.

957,674.

Patented May 10, 1910.

2 SHEETS—SHEET 1.



Witnesses:

William V. Hewitt
Elizabeth M. Brown

Inventor

Jacob Heinz.
 By his attorney
Edward N. Pagelsen

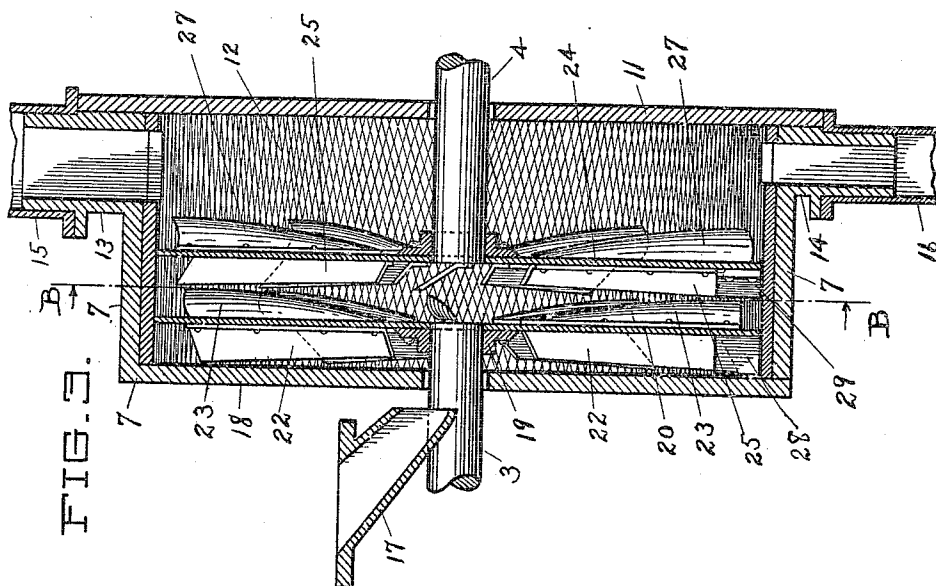
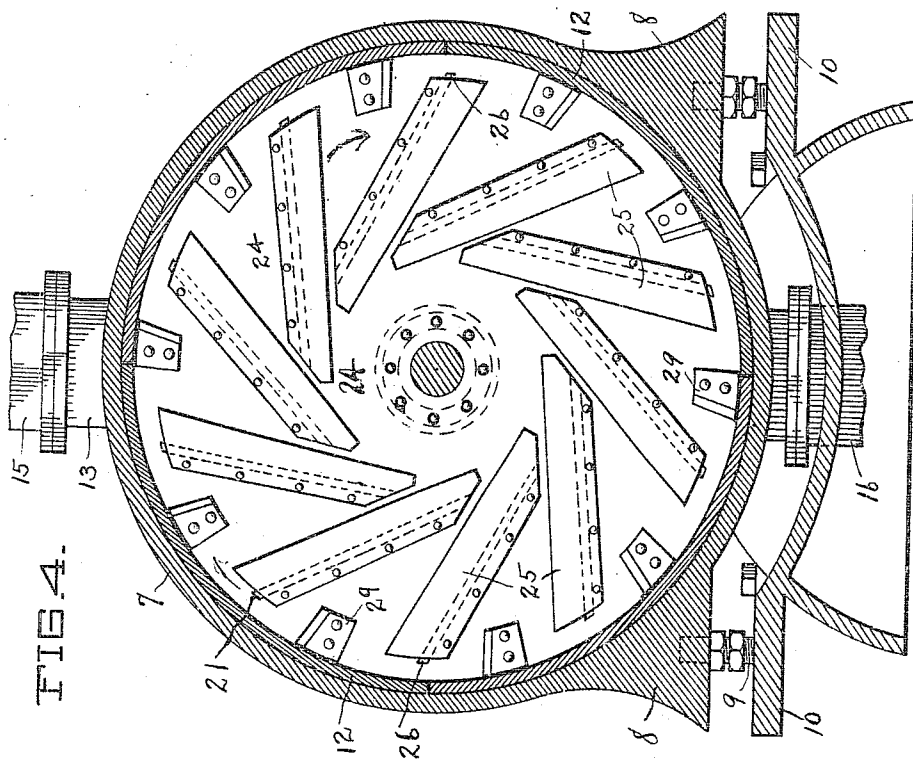
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UNITED STATES PATENT OFFICE.

JACOB HEINZ, OF DETROIT, MICHIGAN, ASSIGNOR TO THOMAS NEAL, OF DETROIT, MICHIGAN.

ABRADING-MACHINE.

957,674.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed August 5, 1907, Serial No. 387,030. Renewed February 9, 1910. Serial No. 542,940.

To all whom it may concern:

Be it known that I, JACOB HEINZ, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Abrading-Machine, of which the following is a specification.

In the manufacture of white lead, three processes are usually employed; first, the "Old Dutch" process in which the lead is cast in buckles and suspended in jars containing acetic acid, which jars are packed in spent tan bark; second, the "Carter" or quick process, in which the lead is atomized in the presence of air and afterward reduced to the carbonate by means of acids and carbonic acid gas; and third, the "Mild" process in which the lead is atomized and acted upon by oxygen and by carbonic acid gas in the presence of water.

The machine illustrated in the accompanying drawings is adapted to reduce the size of small particles of matter in the presence or absence of liquids, at the same time facilitating the chemical action of any of the elements of the air or liquid while in the machine. While other machines have been employed for acting upon various materials when dry, this machine is especially adapted to operate upon substances in the presence of liquids, especially such as have a tendency to cake.

My present invention as embodied in this application consists in a drum having an interior abrading surface, oppositely revolving disks within said drum, each of said disks provided with vanes or buckets for engaging a stream of liquid such as water, which carries particles of solid matter such as lead with it in such a manner as to throw the liquid and the particles of solid matter against the abrading surface, causing the reduction of the solid matter in the presence of the liquid. When water is used and lead acted upon, the presence of the water prevents the lead, which is being reduced, from turning into undesirable high oxides of lead which are difficult to convert into white lead.

In the accompanying drawings, Figure 1 is a plan and Fig. 2 an elevation of my improved machine. Fig. 3 is a cross section on the line A—A of Fig. 1. Fig. 4 is a cross

section on the line B—B of Fig. 3. Fig. 5 is a cross section of the bucket carrying plates.

Similar reference characters refer to like parts throughout the several views.

The bed plate 1 of my machine is formed with a series of bearings 2 in which are revolvable the shafts 3 and 4, which shafts are adapted to be driven in opposite directions by means of pulleys 5 and 6. A drum or case 7 is provided with lateral extensions 8 in which the screws 9 engage, which screws contact with the plate 10 of the bed plate and are thus adapted to adjust the case 7. The head 11 closes one end of the case. Within the case is a lining 12 having a cross grooved inner surface, the grooves being such that the surface approximates that of a double-cut file. A flanged pipe 13 projects from the top of this drum 7 and a similar pipe 14 from the bottom. Discharge pipes 15 and 16 connect to these flanged connections and are adapted to convey away the water and the particles of lead suspended therein and permit the escape of air. A feed pipe or spout 17 is attached to the end wall 18 of the drum or case. The openings in the end 18 and head 11 of the drum are larger in diameter than the shafts, permitting a current of air to enter because of the centrifugal action of the disks.

Secured to the inner end of the shaft 3 is a hub 19 to which is attached a disk 20, preferably of steel plate. This disk 20 is provided with a series of slots 21 inclined to radial lines (see Fig. 5), and on the side of the disk toward the end 18, are secured a series of inclined buckets 22 in such a position on the disks that one line of each slot 21 will be at the line where a bucket joins the disk. The buckets are inclined forward in the direction of revolution of the disk and preferably at an angle of forty-five degrees to the same, the distance between these buckets and the end 18 should be as slight as possible. The inclination of the slots in the plates or disks to radial lines may vary from twenty to forty five degrees according to the speed of the shafts and the material acted upon. On the opposite side of this disk 20 are secured the curved buckets 23 in such a position that the meeting line of each bucket with the disk 20 will also be at one edge of

a slot 21 as shown in Fig. 5. The action of these parts will be as follows: The stream of water entering the drum through the spout 17 and carrying with it fine particles of lead, will be intercepted by the inclined buckets 22, causing the mixture of water and lead to rush through the opening or slot 21 in plate 20. When this mixture has passed through these slots, it will be caught up by the grooved buckets 23 and carried around with these buckets and against the abrading surface of the lining 12 of the drum and thus attaining a rotary motion, and the lead being heavier than the water will grind against the abrading surface and be reduced to a smaller form. As the mixture is sliding out along the buckets, air will pass in through the annular opening around the shaft 3 and pass into the mixture, reducing the finest particles of lead and also the outer surfaces of the other particles to the lower oxids. The oxids on these particles will be brushed or broken off by being beaten by the buckets on the revolving disks and thus allow further reduction. To still further effectuate this reduction, a second plate 24 is mounted upon the shaft 4 and will revolve in opposite directions to the disk 20. Inclined buckets 25 are secured to this disk adjacent to the slots 26 and these buckets will take up the mixture borne by the curved buckets 23, which mixture taken up by the buckets 25 will pass through the slots 26 and be taken up by the curved buckets 27 and again dashed against and borne around against the abrading surface of the lining 12. The angles between these slots and buckets and radial lines will usually be less than in the first disk. The mixture will travel around against the abrading surface and will also travel laterally toward the head 11, and finally pass out through the openings 13 and 14 and the pipes 15 and 16. Through these pipes 15 and 16 the mixture will flow to a separating tank where it will remain sufficiently long for all the particles of metal lead to settle to the bottom of the tank where it will again be conveyed in water to the machine through the spout 17. The impalpable powder of lead oxid held in suspension by the water will pass forward for further treatment.

There is a possibility of a ridge of particles of lead lodging in the angle between the end 18 of the drum, and the abrading surface. To prevent this, I secure a series of scrapers 28 to the disk 20 as shown in Fig. 3, and similar scrapers 29 secured to the disk 24 prevent the accumulation of material at the outside of the buckets 25. The rush of the mixed water and lead prevents any such accumulation outside of the buckets 23 and 27.

Having now explained my improvements, what I claim as my invention and desire to secure by Letters Patent is:—

1. In an abrading machine, the combination of a drum having an abrading surface and inlet and outlet passages, a revoluble shaft projecting into said drum, means to revolve the shaft, a bucket carrier mounted on said shaft and buckets attached to opposite sides of said carrier and inclined in opposite directions from the same.

2. In an abrading machine, the combination of a drum having an interior abrading surface, inlet and outlet pipes or conveyers connected to said drum, a revoluble shaft projecting into said drum, means to revolve the shaft, a bucket carrier mounted on said shaft, and buckets attached to opposite sides of said carrier and inclined in opposite directions from each other, said buckets being inclined to radial lines with their outer ends in the direction of revolution of the shaft.

3. In an abrading machine, the combination of a drum having inlet and outlet passages, a revoluble shaft projecting into said drum, means to revolve the shaft, a disk mounted on said shaft and provided with a series of slots, buckets attached to one side of said disk adjacent to said slots and inclined from said disk in the direction of the movement of the same, and a second series of buckets secured to said disk on the opposite side thereof and adjacent to and at the same side of each slot, said buckets being inclined in opposite direction to the first.

4. In an abrading machine, the combination of a drum having inlet and outlet passages, the interior of the shell of the drum having an abrading surface, revoluble shafts projecting into said drum, means to revolve the shafts in opposite directions, a disk mounted on each shaft and provided with a series of slots, inclined buckets attached to each disk adjacent the slots in the same, and curved buckets secured to the opposite sides of the disks.

5. In a machine for reducing lead to a powder, the combination of a drum having openings through which a mixture of water and lead may flow into and out of the drum, two shafts extending into said drum and revoluble in opposite directions, means to revolve the shafts, disks secured to said shafts, inclined buckets attached to said disks on opposite sides thereof, and on the same side of slots through said disks.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JACOB HEINZ.

Witnesses:

MIRON W. NEAL,
GEORGE G. MURPHY.