July 31, 1923. 1,463,405

J. P. RUTH, JR

FLOTATION APPARATUS

Filed Oct. 4, 1919

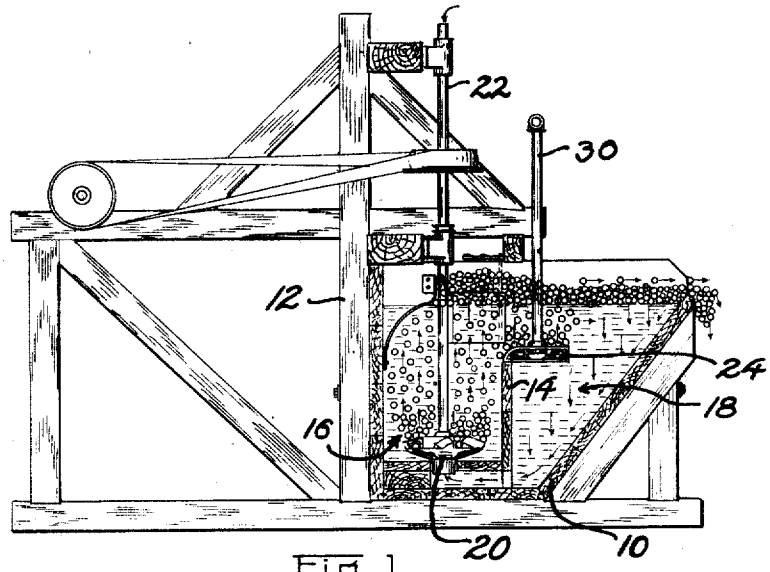


Fig. 1

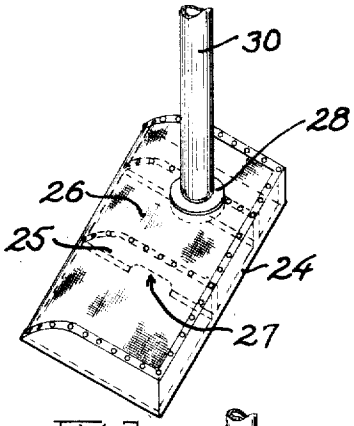


Fig. 3

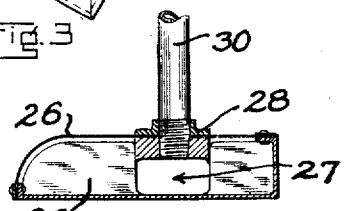


Fig 4

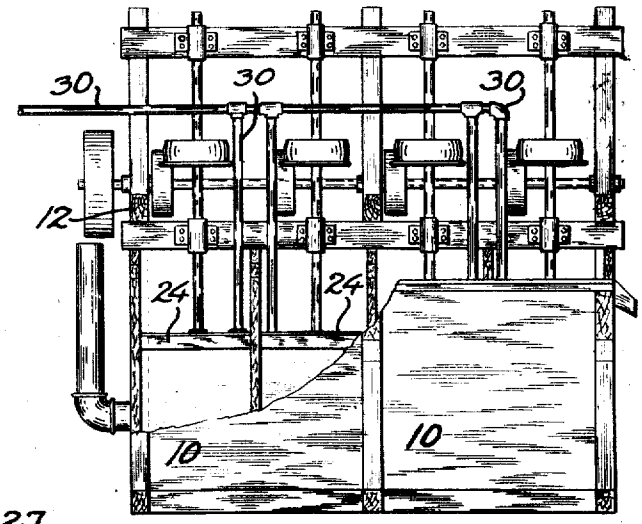


Fig 2

Joseph P. Ruth Jr.

INVENTOR.

Patented July 31, 1923. 1,463,405

UNITED STATES PATENT OFFICE.

JOSEPH P. RUTH, JR., OF DENVER, COLORADO.

FLOTATION APPARATUS.

Application filed October 4, 1919. Serial No. 328,449.

To all whom it may concern:

Be it known that I, JOSEPH P. RUTH, JR., a citizen of the United States, residing at the city and county of Denver, State of Colorado, have invented certain new and useful Improvements in Flotation Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to practice the same.

The object of the invention is to materially improve flotation methods, and also to assist the flotation of heavy particles or particles otherwise difficult to float.

Briefly the invention comprises an aerating lip mounted at the point of overflow on the upper edge of the partition used to divide flotation cells into mixing and settling compartments wherein the pulp overflows from the former to the latter compartment.

In the drawings forming a part of the specification.

Fig. 1 is a cross section thru a machine showing the application of this invention;

Fig. 2 is a front elevation (looking toward the left in Fig. 1) with a part of the front wall broken away;

Fig. 3 is a perspective of the aerating member; and

Fig. 4 is a cross section thru the same;

Cells 10 are mounted upon a suitable framework 12 as shown. Each cell is divided by means of a partition 14 into a mixing or aerating compartment 16 and a settling compartment 18. The two compartments are connected at the bottom and an aerator or mixer 20 in the bottom of compartment 16 circulates the pulp in the direction indicated by the arrows. The member 20 is driven as shown thru the medium of a shaft 22 which may be hollow for the introduction of air to aerate the pulp as it is introduced into the bottom of the compartment 16.

Mounted upon the overflow edge of the partition 14, is a hollow casing 24 constituting an overflow lip. This casing is provided with partitions 25 and is covered with a porous top 26 for the passage of air, the partitions 25 having openings therein as at 27 for air to travel the length of the casing. At one of the partitions the casing is provided with a boss 28 into which a pipe 30 is threaded for the introduction of air into the hollow casing.

As the pulp rises and passes over the casing from the mixing compartment to the settling compartment, the bubbles rising from the casing 24 thru the porous member 26 serve to further lighten the pulp and to assist in directing the froth with more certainty toward the launder. This insures the collection of more of the froth. At the same time bubbles from the casing 24 will assist in the flotation of particles that are heavier than usual and which would have a tendency to drop into the settling compartment as soon as they passed over the partition 14 and were thereby freed of the direct impulse of the flotation current. In other words opportunity is provided for the attachment of air bubbles or additional air bubbles, as the case may be, to particles capable of flotation but not properly floated in the agitation compartment, this step taking place before said particles have an opportunity to detach themselves and settle to the bottom of the settling compartment.

Thus it will be seen that by the addition of this aerating member at the top of the overflow partition 14, flotation will be materially assisted and the recovery of values increased. This will also increase the tonnage of the machine.

I claim:

1. Flotation apparatus having a mixing compartment and a separating compartment adapted to maintain a relatively quiescent body of pulp therein, a partition dividing the compartments and over the top of which pulp is adapted to flow, means to maintain the pulp level above said partition, a hollow member on the top of said partition, one wall of said member being porous, means for introducing gas into said member whereby it will pass thru said porous wall and into the overflowing pulp and means in the mixing compartment for introducing gas into the pulp, said pulp level being uninterrupted whereby pulp and froth may flow freely and uninterruptedly from the top of the mixing compartment over said member and across said separating compartment.

2. Flotation apparatus having a mixing compartment and a separating compartment, a partition dividing the compartments from each other and over the top of which the pulp is adapted to flow, means to maintain the pulp level above said partition, an overflow lip on the top of said partition, said lip having a face per-

forated for the passage of air therethru, means for introducing air thru said face into the overflowing pulp and means in the mixing compartment for introducing gas into the pulp, said pulp level being uninterrupted whereby pulp and froth may flow freely and uninterruptedly from the top of the mixing compartment over said lip and across said separating compartment.

3. Flotation apparatus comprising a cell, a partition therein dividing the same into a mixing compartment and a separating compartment adapted to maintain a relatively quiescent body of pulp therein, means to maintain the pulp level above said partition, the pulp being adapted to overflow the top of said partition into the settling compartment, said settling compartment having a froth discharge and both compartments having circulation ports at their lower portions, an aerating member in said mixing compartment, and an aerating member mounted on the top of said partition for the introduction of gas into the overflowing pulp to assist flotation and the movement of the froth to the froth discharge, said member having a porous wall and means for introducing gas through said wall into the pulp, the space at the pulp level between said mixing compartment and said froth discharge being uninterrupted so that froth and pulp may flow freely from the mixing compartment to the froth discharge.

In testimony whereof I have affxed my signature.

JOSEPH P. RUTH, JR.