



ENRICHMENT OF GOLD ORES BY GRAVITY METHOD

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ABSTRACT

This article is about extracting gold, one of the rare metals. Rare metals are distinguished by their higher density than other metals and the minerals that come with it are also denser. That's it in the separation of rare metals in the natural state due to the gravity method enrichment is effective. Many gold-bearing ores are known amount of pure gold (+1) mm, not only poorly separated in flotation, but it is poorly separated in hydrometallurgy, for this reason ores Enriched by the initial gravity method, the large ones are separated prevents waste and is ready for faster sale the product is received. In modern practice, the following main machines are used in gravity beneficiation to extract gold from ores of root deposits: sedimentation machines, sluices, concentration table, drum concentrators, short cone hydrocyclones.

INTRODUCTION. Extraction of gold in sedimentation machines. Precipitation in a sedimentation machine corresponds to the separation (sediment) of mineral particles in an oscillating flow due to their density. Gravitational grading is related to the density and uniformity and shape of the ore lump.

Minerals are divided into the following types according to their density:

1. Heavy - native gold with a density of more than 4000 kg/m³;
2. Medium - density 2700-4000 kg/m³;
3. Light - density up to 2700 kg/m³.

Group of mineral particles obtained by **gravity extraction is called a fraction**. The particles that have come to the surface are called the light fraction, the settled ones are called the heavy fraction, and the suspended ones are called the hard fraction.

Gravitational beneficiation - one of the methods of beneficiation of minerals in mining is carried out due to the difference between the density of minerals. There are other types of gravitational beneficiation, sedimentation on beneficiation tables, separation in water eddies (hydrocyclone) and other types. Gravitational enrichment can take place in a variety of environments. This process continues with water in aqueous enrichment, in heavy suspensions, and air in pneumatic enrichment.

Fraction is a category, section, group, class-mixture that has properties different from the average properties and is separated from it.

Fractional analysis - fractions with different densities are separated from each other due to the difference in density and specific gravities of the ores in the ore rock. Sediment sorting is the most common type of gravity enrichment.

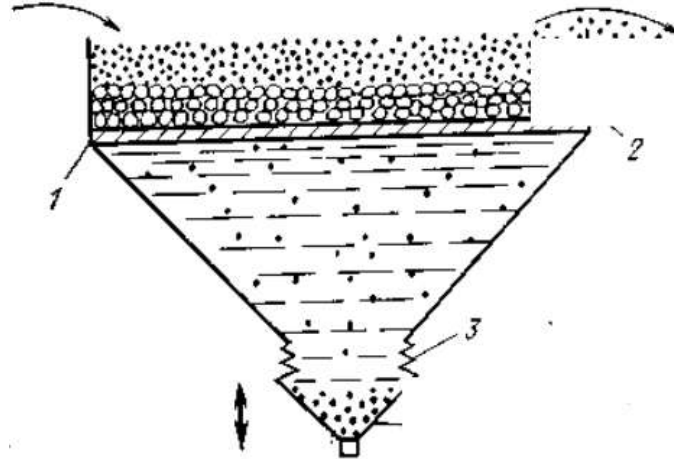


Figure 1. Sinking machine. 1- Supply product; 2- Light fraction (waste); 3-Heavy fraction (concentrate)

LITERATURE ANALYSIS AND METHODOLOGY

Crushed ore is fed into the screen of the sintering machine in the form of a body. During the enrichment of the fine product, the initial artificial bed is laid on the grid. The density of artificial stone must be lower than the density of the heavy fraction and higher than the density of the light fraction. Metal bullets or hematite ores are used as an artificial bed during the enrichment of gold ores. The size of the bed pieces should be 3-6 times larger than the size of the enriched product. The pulp material moves over the bed towards the screen. Solid particles settle quickly to the bed under the influence of gravity, but their settling speed is different. It is faster in heavy particles than in light ones. When the water rises, the loose rocks move up, and the heavy gold particles sink without rising. In the descending current, the gold has time to move towards the sieve and leaves the light fraction behind. Diaphragms provide constant water pulsation, as a result of which the products are separated into layers according to their density: gold and other heavy fractions pass through the bed and are discharged under the sieve, light particles and loose rocks are the sugar remains in the upper layer and is released from the mouth called slivnoi parog. Water is supplied to the immersing machine together with the product, and a certain amount of water can be added from under the net.

Of a sedimentation machine operating in a continuous cycle of enrichment : particles of low density are in the upper layer, particles of medium density are in the middle layer, and particles of high density are in the lower layer.

In the OMR-1A sintering machine operating in the conditions of the second workshop is 160 mm above the grid plane.

OMR-1A from minerals in the bed depends on:

1. The initial product should be applied correctly to the surface of the mattress.
2. To release light fraction.
3. Loading from the heavy fraction to the sedimentation chamber.



4. It depends on the surface of the bed in light particles.

The initial product should be evenly distributed over the entire surface of the bed. The bulk flow should be sufficient to disperse the light fraction and not wash away the particles of the heavy fraction. When the flow rate decreases, the light fractions accumulate and settle, causing the process to stop.

OMR-1A has aerial cameras. The body of the machine consists of three separate chambers. The effect of pulsation frequency and air pressure on the deposition mode. When the air pressure increases, the flow rate and oscillation amplitude increase. Enrichment in water flow on an inclined plane is based on the differentiation of ore particles according to the nature of movement under the dynamic influence of water flow. The separation of mineral particles is carried out on the basis of the movement of a suspension current with a small depth on an inclined plane .

Of sedimentation machines are as follows: availability of the possibility of processing unclassified products; high production efficiency; the presence of the ability to work even in the case of a low liquid:dark phase of the pulp.

Enrichment of gold in concentration tables. The graviococoncentrate from the settling machine is sent to the washing process for additional enrichment. Concentration tables are used to perform this task

Enrichment in tables is based on the separation of mineral particles due to the density difference in the water stream.

The SKM-1A concentration table is a plane made of a board made of pine wood and covered with rubber. It is called a sloping plane. The vibration frequency of the table is 275-300 rpm, the step is 15-20 mm. The body is fed to the loading part of the table and flows with a speed depending on the angle of inclination of the deck. Due to the movement of the suspension current, the heavy minerals are trapped by the riffles, while the light particles continue their movement. Enrichment tables are one of the main machines for gravity enrichment.

The enrichment table consists of the following parts.

1. Form or stanina - serves as the support base of the table.
2. Deka - the inclined plane of the enrichment table - the working body.
3. Flat - ribs (narifleniye).
4. The driving mechanism.
5. The raw material receiving box is located at the top.
6. Rhombus-shaped water distributor.

The table top can be turned at a certain angle. It can be covered with wood, rubber, linoleum. Ribs are spaced from top to bottom at long intervals. Its height will be 2 mm .

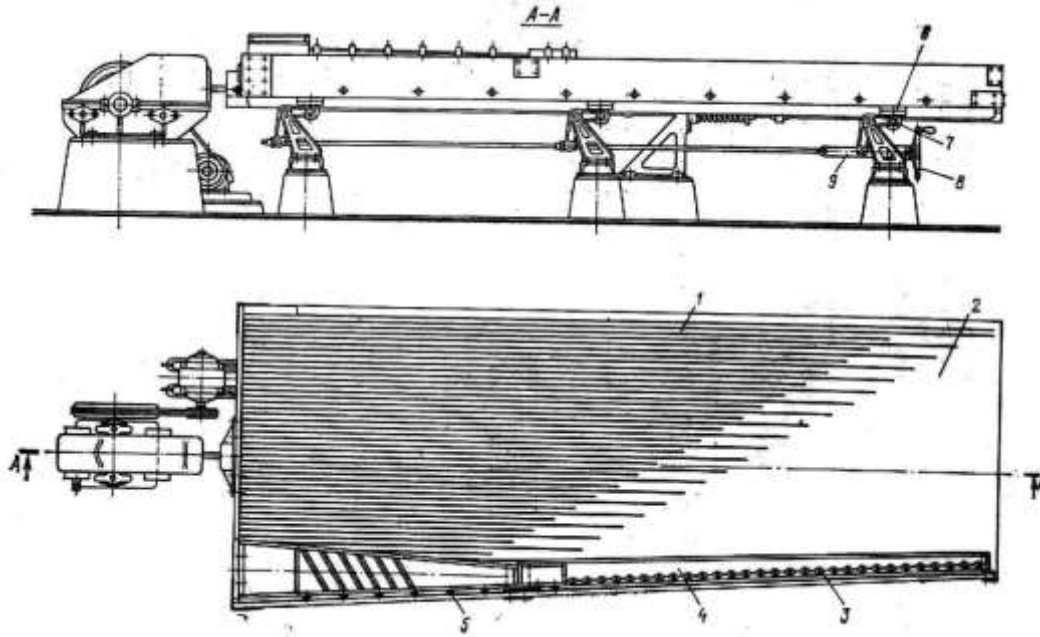


Figure 2. Concentration table SKM-1. 1-base plate; 2- roller support; 3- mahovik structure; 4- screw; 5- reef; 6th deka; 7- moving plate controlling water supply; 8- washed water pool; 9- loading compartment.

RESULTS

The table vibrates in a forward motion. The whole body is washed with water. Ore particles with a size of 0-2 mm are used well in such tables. Particles with high density are pushed between the ribs to the edge of the table and pour down, forming a heavy material enrichment. Light sand particles are quickly lifted by water, washed away, fall down at the top and middle of the table and are collected as waste and intermediate products. At the end of the table, the heaviest, medium and heavier particles are separated by a serpentine stream. Each particle on the table is affected by longitudinal force, gravity force, transverse force, water washing force.

Placed after the sintering machine in plants such as GMZ -1, GMZ-2 . The enrichment table is one of the most efficient gravity enrichment machines. Enrichments are carried out again and again to meet the demand. The resulting enrichments are sent to the amalgamation or refining plant to melt gold.

Conclusion . Since gold is a chemically inert metal, it is found in the ore in a native (metallic) state. Gold in the ore comes in different sizes and is associated with different minerals. If the ore contains large gold (gold grains larger than 74 μm), this gold is extracted by gravity beneficiation. The main reason for this is that large - sized gold can be leached from hydrometallurgical processing without being completely dissolved. After the coarse gold is extracted, the fine gold in the ore is selectively dissolved with cyanide solutions and extracted from the solution. Nowadays, in most gold extraction plants, large amounts of gold are extracted in the crushing stage and processed separately after further refining.



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