

# UNITED STATES PATENT OFFICE.

WALTER MURRAY SANDERS, OF MARION, KENTUCKY.

PROCESS OF CONCENTRATING ORES.

988,737.

Specification of Letters Patent.

Patented Apr. 4, 1911.

No Drawing. Application filed October 27, 1906, Serial No. 340,856. Renewed September 9, 1910. Serial No. 581,279.

*To all whom it may concern:*

Be it known that I, WALTER MURRAY SANDERS, a citizen of the United States, residing at Marion, in the county of Crittenden and State of Kentucky, have invented certain new and useful Improvements in Processes of Concentrating Ores, of which the following is a specification.

This invention is a process of concentrating ores, and consists essentially in subjecting the ores to a preliminary purification or mechanical concentration to separate therefrom certain components which I have found to exert a prejudicial effect upon the separation by the so-called "flotation process", or upon the solutions employed therein; and thereafter subjecting the purified or partially concentrated ores to treatment by flotation to effect a further concentration thereof.

I have discovered that when sulfid ores containing a considerable proportion of a carbonate, such as calcite, are directly concentrated by the flotation process, in a solution adapted to react upon the ore to produce bubbles and capable of reacting upon calcite, a decomposition or alteration occurs in the solution which reduces its efficiency and in time necessitates its renewal or replacement; and that such decomposition or alteration occurs both in the use of acid solutions, and in the use of non-acid solutions in accordance with my Patent 805,382, issued November 21, 1905. I have further discovered that the preliminary separation of the calcite, and of such other components of relatively low specific gravity as are usually eliminated with the calcite, does not exert an injurious effect upon the subsequent separation by means of acid or non-acid solutions, but that by means of such preliminary purification the effective life of the solutions is indefinitely prolonged.

I will describe my invention by reference

to an ore containing as its principal components the minerals sphalerite, galena, fluorite, calcite and quartz. This ore in a suitable state of subdivision is first purified or concentrated, preferably by running the same over tables in such manner as to effect a separation of substantially all of the calcite, together with part or all of the silica, leaving a table concentrate consisting substantially of sphalerite, galena and fluorite, with perhaps a small proportion of silica. This concentrate is then further treated by flotation, a non-acid solution being preferably employed in accordance with the conditions set forth in my patent above referred to. Substantially all of the sphalerite is thus recovered.

I do not limit myself to any particular form of apparatus for the treatment of the ore, nor to any particular solution for concentrating the same by flotation.

I claim:—

1. The process of concentrating sulfid ores, which consists in first concentrating the ore to effect a substantially complete separation of calcite, and thereafter subjecting the purified ore to further concentration by flotation in a solution adapted to react upon the ore to produce bubbles and capable of reacting upon calcite.

2. The process of concentrating sulfid ores which consists in first concentrating the ore to effect a substantially complete separation of calcite, and thereafter subjecting the purified ore to further concentration by flotation in a non-acid salt solution adapted to react upon the ore to produce bubbles and capable of reacting upon calcite.

In testimony whereof, I affix my signature in presence of two witnesses.

WALTER MURRAY SANDERS.

Witnesses:

W. E. CARNAHAN,

H. H. SAYRE.