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(54) IMPROVEMENTS IN OR RELATING TO SIEVES

(71) We, SHUM YIP LEONG RUBBER WORKS, SENDIRIAN BERHAD, a body corporate organised under the laws of Malaysia, of P.O. Box 26, 1¼ Mile, Kapar Road, Klang, Selangor, Malaysia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention related to sieves, particularly but not exclusively for use in the extraction of metallic ores from sludge.

Sieves for this purpose which comprise plates formed from interwoven strands of stainless steel are well known. They have the disadvantage that particles readily become lodged in their mesh thereby "blinding", i.e. reducing the open area of, the plates. Jigs using such sieves have to be periodically dismantled to remove the lodged particles.

An object of the invention is to provide a sieve which, at least in its preferred embodiments, is less susceptible to blinding than the above described sieve.

Accordingly the present invention provides a rigid sieve which comprises a sheet of resilient rubber bonded to a substantially more rigid rubber support plate therefor, and a multiplicity of apertures in said sieve extending through both said resilient sheet and said support plate, the minimum width of each of said apertures where it extends through said resilient sheet being substantially less than the minimum width of the aperture where it extends through said support plate.

The nature of the resilient sheet of such a sieve permits slightly over-size particles to squeeze through the apertures therein rather than becoming lodged in the apertures; in other words, in operation, substantially all particles will either pass through the sieve or not pass through it. The minimum widths of the said apertures where they extend through the support plate will be made such as to ensure that all particles which are capable of passing through the resilient sheet will pass freely through the support plate.

Both the resilient sheet and the support plate may be formed of natural or synthetic rubber and may be bonded together by adhesive or by vulcanising. The resilient sheet preferably has a hardness in the range of from 40 to 48° Shore Durometer whilst the support plate preferably has a hardness in the range of from 80° to 95° Shore Durometer.

The apertures are preferably conical (with their narrow ends in the resilient sheet) and are preferably formed after the resilient sheet and support plate have been bonded together. Apertures of other than conical form could be provided; for example cylindrical apertures, the part of each aperture extending through the resilient sheet being of substantially smaller diameter than the part extending through the support plate.

Viewed from another aspect the invention provides a jig for use in the extraction of metallic ores from sludge, incorporating at least one sieve as set forth above.

One embodiment of a sieve in accordance with the invention will now be described by way of example and with reference to the accompanying drawing, in which:—

Figure 1 is a plan view of the sieve;

Figure 2 is a cross-section taken along line II—II of Figure 1; and

Figure 3 shows a jig incorporating the sieve shown in Figures 1 and 2.

Referring to Figures 1 and 2 of the drawing, there is shown a sieve which is generally identified by reference numeral 1. The sieve 1 comprises a resilient sheet 2 made of rubber with a hardness of 45° (Shore Durometer) and a support plate 3 made of rubber with a hardness of 93° (Shore Durometer). The resilient sheet 2 and support plate 3 are bonded together along line 4. A plurality of conical apertures 5 extend through the sheet 2 and the support plate 3 as shown.

In Figure 3, there is shown a jig for use in the separation of tin ore from sludge

and which is generally identified by reference number 6. The jig 6 comprises a hutch 7 having an upright wall 8, a bottom 9 and an inclined wall 10. A diaphragm 11 forms part of the upright wall 8 and is adapted to be reciprocated along line A—A by a motor (not shown). Two 'L' beams 12 and 13, are secured to the sides of hutch 7 and support a removable cast iron supporting grid 14. The sieve 1 is placed over the supporting grid 14 with the resilient sheet 2 facing upwardly as shown. A ragging basket 15 made of cast iron or mild steel is placed over the sieve 1 and a layer of haematite ragging 16 about 3 inches deep is placed on top of the sieve 1. The L beams 12 and 13 preferably have a gradient of 1 in 17 to 1 in 30.

When the jig is ready for use the hutch is filled with water and the diaphragm 11 is reciprocated. The pressure waves generated by the diaphragm 11 are reflected upwardly on the inclined wall 10 and alternately causes water to flow upwardly and downwardly through apertures 5. Screened sludge, typically comprising quartz sand, cassiterite, illmenite, pyrite and zircon is fed to the jig.

As the sludge passes over the jig the denser particles work downwardly through the bed of haematite and pass through the sieve 1 into the bottom of the hutch 7. The remaining minerals, known as "tailings" which comprise mainly sand, stay in suspension above the haematite ragging and flow over the end of the jig. The denser minerals are periodically sucked from the bottom of the hutch 7 and are separated and further treated in a tin dressing shed.

WHAT WE CLAIM IS:—

1. A sieve which comprises a sheet of resilient rubber bonded to a substantially more rigid rubber support plate therefor, and a multiplicity of apertures in said sieve extending through both said resilient sheet and said support plate, the minimum width of each of said aperture where it extends through said resilient sheet being substantially less than the minimum width of the aperture where it extends through said support plate.

2. A sieve as claimed in claim 1, wherein the rubber of said support plate has a hardness in the range of from 80 to 95° Shore Durometer.

3. A sieve as claimed in claim 1 or 2, wherein the rubber of said resilient sheet has a hardness in the range of from 40 to 48° Shore Durometer.

4. A sieve as claimed in any preceding claim wherein said apertures are conical with their narrow ends in the resilient sheet.

5. A sieve substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

6. A jig incorporating a sieve as claimed in any preceding claim.

7. A jig substantially as hereinbefore described with reference to and as shown in Figure 3 of the accompanying drawing.

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