

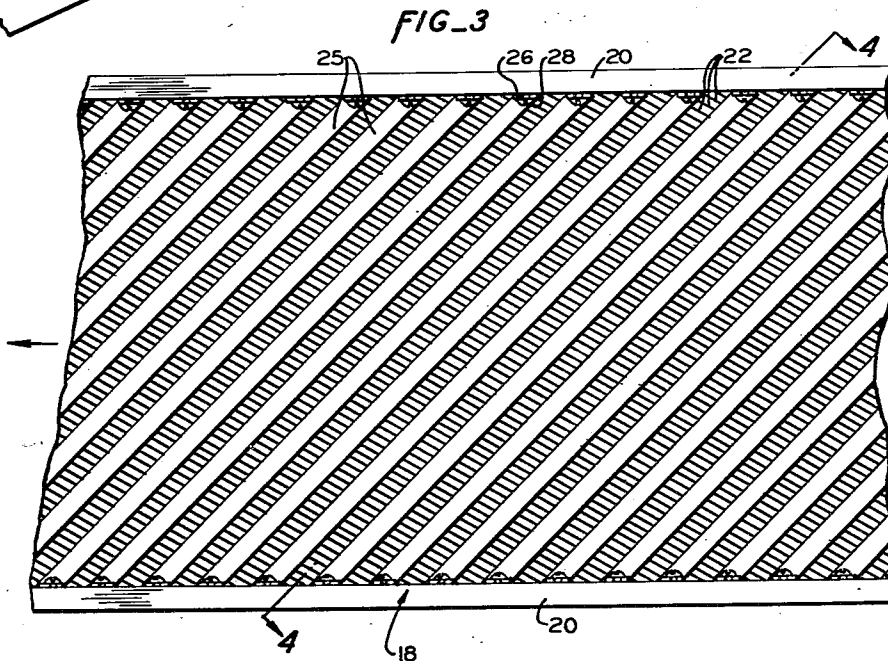
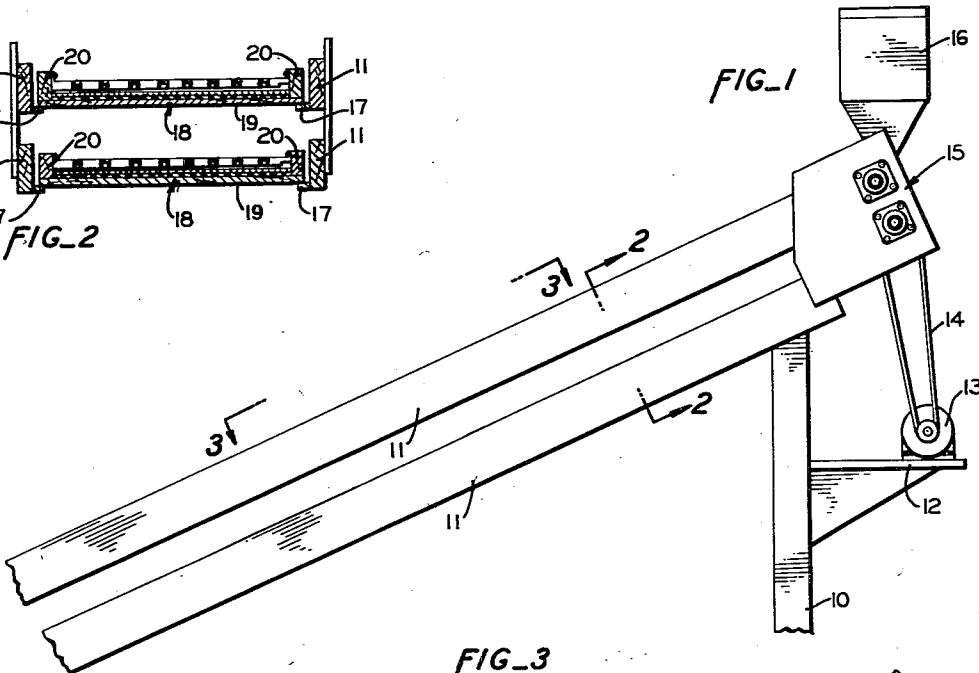
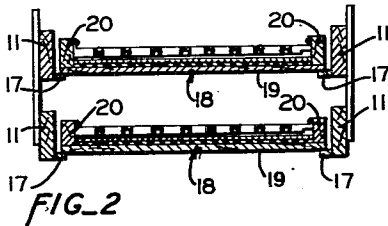
June 4, 1957

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DRY PLACER SEPARATOR

2,794,552

Filed Dec. 2, 1954

2 Sheets-Sheet 1



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FIG-4

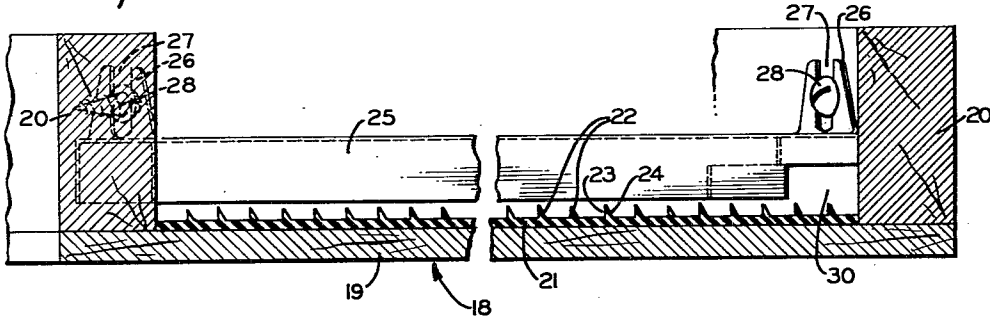


FIG-5

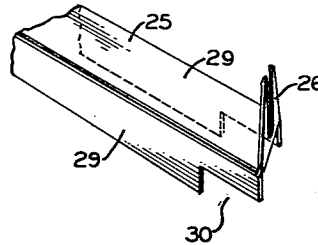
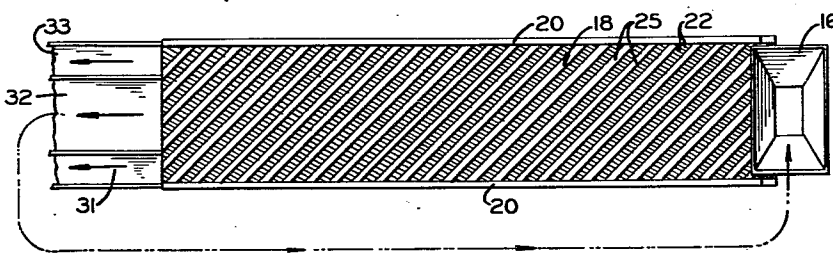


FIG-6



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2,794,552

DRY PLACER SEPARATOR

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2 Claims. (Cl. 209—480)

This invention relates to a separator for separating particles of different specific gravities from material such as placer deposits. More particularly, the invention relates to a dry separator for separating placer sand and values. The invention is not limited to this specific industry, however, and has wide application wherever it is necessary to separate a mixture of particles of different specific gravities.

It is well known that many ancient ore bodies have been broken down through the years and mixed with sand to produce the primary placer deposits found in many districts throughout the world. It is very difficult to profitably treat this type of deposit since the concentration of valuable minerals is very thinly disposed, thus requiring the treating of extensive amounts of material.

Many of these placer deposits have been known by geologists for many years but are still unworked since the usual equipment for separating concentrates such as "vanners," "jigs," "tables," spirals, and "oil flotation cells" do not have the capacity to profitably handle such a large volume of material wherein the values are so thinly disposed. Further, many of these deposits are located in desert areas where no water is available to operate these types of equipment.

It is the principal object of this invention to provide a dry separator capable of continuous operation, which separator has the ability to expeditiously treat a large volume of material but yet requires a relatively small space and can be produced at a low initial cost.

Another object of this invention is to provide a dry separator wherein the separator trays are relatively narrow and shallow, and of light weight so that they can be arranged in batteries and all vibrated by one vibrating mechanism, and thereby be of large capacity but operated with a minimum of power.

A further object of the invention is to provide a separator in the form of an elongated relatively narrow and shallow inclined tray, wherein the mixture moves downwardly over the surface of the tray and the heavier particles are constantly moved toward one side of the tray, while the lighter particles are moved toward the other, whereby the separator is able to discharge from 50% and 75% of the first run sand as tailings without material loss of the microscopic values therein.

A preferred form of my invention is described in the following detailed specification and illustrated by way of example in the accompanying drawings, wherein:

Fig. 1 is a side elevation of a separator embodying the principles of my invention.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a fragmentary view illustrating the end details of one of the guide members.

Fig. 6 is a plan view of the device.

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Referring now to the drawings, wherein the same reference numerals are used to designate the same elements throughout the various views shown, the device comprises a main frame having rear supporting legs 10 connected at their upper ends to diagonal side members 11. A shelf 12 extends rearwardly from the legs 10 and a motor 13 is supported thereon. A drive belt 14 connects the motor to a vibrator or shaker generally indicated at 15. The vibrator or shaker 15 is fastened to the upper ends of the side members 11. The details of the vibrator per se form no part of the instant invention. It is merely any mechanism capable of rapidly shaking the separator trays longitudinally backward and forward relative to the supporting side members 11. A hopper 16 is provided to distribute the material to be separated onto the separating trays.

Referring now to Figs. 2 and 4, each of the side members 11 has an inwardly projecting flange or supporting member 17 attached adjacent its lower edge. The separating trays, generally indicated at 18, are slidably supported on the flanges 17 between the side members 11. Each of the trays 18 comprises a bottom member 19 and two side members 20. A mat 21, having upstanding ribs 22 formed thereon, rests on the bottom 19. The mat 21 is made of rubber or similar material. The ribs 22 extend diagonally across the tray 18 at approximately 45° to the longitudinal axis thereof, and are triangular in shape. The upwardly facing sides 23 of the ribs are vertical and the downwardly facing sides 24 are inclined.

A plurality of channel-shaped guides 25 extend diagonally across the trays 18 at an angle of approximately 45° to the longitudinal axis thereof above the ribs 22 and are inclined in the opposite direction with respect to said ribs. The channel-shaped guides 25 are mounted with the flanges 29 thereof extending downwardly, and are spaced from each other a distance equal to the width of the channel. Each of the channel-shaped members has a vertically extending flange 26 at each end thereof provided with a vertical slot 27. The channels are adjustably mounted to the side members 20 by screws 28 extending through the slots 27. As best seen in Figs. 4 and 5, the lower corners of the flanges 29 are cut out, in the manner indicated at 30, adjacent the end of each channel nearest the discharge end of the tray.

In the operation of the device, the drive motor 13 and vibrator 15 shake the trays 18 longitudinally with about a 1/8 inch stroke at approximately 1,000 cycles per minute. Ore in a finely crushed state is introduced through the hopper 16 and distributed on the several stacked trays 18. As the ore passes downwardly over the tray, it is agitated by the shaking thereof and the heavy concentrates tend to settle toward the bottom of the layer of material and the lighter tailings tend to float toward the top.

Referring now to Fig. 6, wherein the direction of material flow is from right to left, the ribs 22 tend to move the concentrates (the lower portion of the layer of material) toward the side of the tray uppermost in the figure. The flanges 29, which are only spaced slightly from the upper edges of the ribs 22, tend to move the tailings (the upper portion of the layer of material) toward the side edge of the tray lowermost in the figure. At the discharge end of the tray the material in zone 31 will consist of tailings which can immediately be discarded. The material in zone 33 will consist of concentrates which may immediately be subjected to further processing, and the material in zone 32 will be

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returned to the hopper 16 to be re-run through the separator.

While I have shown and described the preferred form of my invention, it is to be understood that various changes may be made therein by those skilled in the art, without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A dry separator comprising a flat tray having upwardly extending sides, means mounting said tray on an incline, means for reciprocating said tray forwardly and rearwardly along said incline, a plurality of ribs extending upwardly from the bottom of said tray, said ribs extending diagonally across said tray at a relatively steep angle to the longitudinal axis thereof, each of said ribs being triangular in cross section with the upper side thereof perpendicular and the lower side inclined to the bottom of said tray, a plurality of flat guide members each perpendicular to the bottom of said tray and extending diagonally to the longitudinal axis of said tray in the opposite direction from the inclination of said ribs, said guide members being supported between said side members with their lower edges spaced slightly above the top edges of said ribs, the lower corner of each of said guides being notched upwardly adjacent the end thereof nearest the bottom of said tray.

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2. A dry separator comprising a flat tray having upwardly extending sides, means mounting said tray on an incline, means for reciprocating said tray forwardly and rearwardly along said incline, a mat resting on the bottom of said tray, a plurality of ribs extending upwardly from the upper surface of said mat, said ribs extending diagonally across said tray at a relatively steep angle to the longitudinal axis thereof, each of said ribs being triangular in cross section with the upper side thereof perpendicular to and the lower side inclined to the bottom of said tray, a plurality of flat guide members each perpendicular to the bottom of said tray and extending diagonally to the axis of said tray in the opposite direction from the inclination of said ribs, said guide members being supported between said side members with their lower edges spaced slightly above the top edges of said ribs, the lower corner of each of said guides being notched upwardly adjacent the end thereof nearest the bottom of said tray.

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