

Feb. 28, 1933.

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1,899,737

RESILIENT GRIZZLY AND SCREEN

Filed May 26, 1930

Fig. 1.

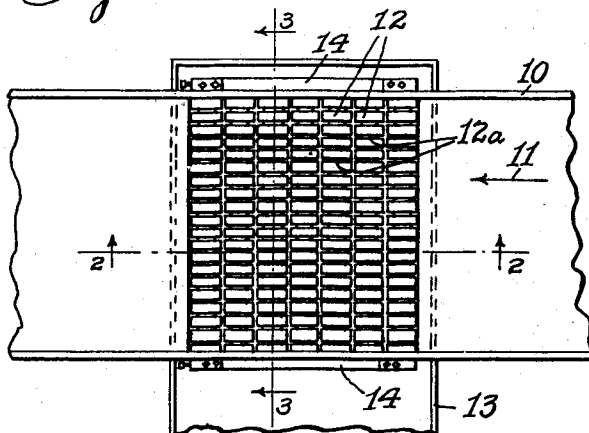


Fig. 2.

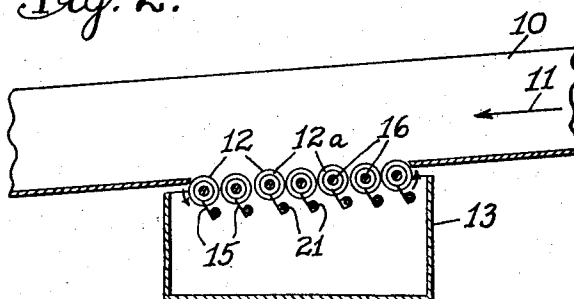


Fig. 3.

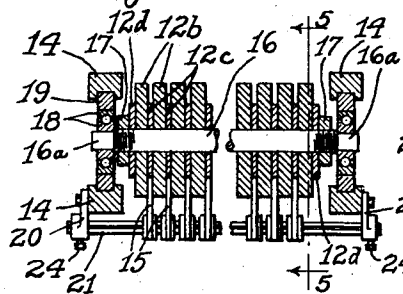


Fig. 4.

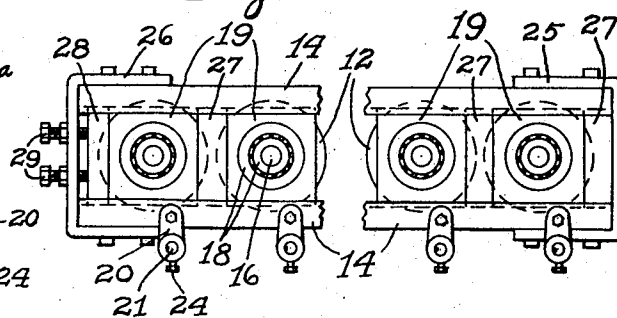
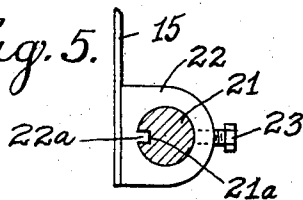


Fig. 5.



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RESILIENT GRIZZLY AND SCREEN

Application filed May 26, 1930. Serial No. 455,593.

My invention relates to an improved form of screen for separating or classifying mixed material containing solid pieces or particles of different sizes, so that pieces or particles up to a given size will pass through the screen and pieces or particles of larger size will be delivered from another portion of the screen without passing through it, my screen consisting essentially of rollers of resilient material which may be provided with grooves of substantially the width of the pieces or particles to pass through the screen, and separated from each other, preferably, by a distance substantially equal to the width of the grooves. While my improved screen construction is adapted for use for many purposes, it is particularly applicable for use as a grizzly in placer mining, for separating fine material from coarse material contained in the mixed water and solid material resulting from placer mining.

In connection with placer mining, the mixture of water and solid material may contain large pieces of rock which have little or no value, and in addition, considerable fine material of a solid nature which it is desired to separate from the coarser material, and to treat in one way or another to recover the precious metals therefrom. My improved screen construction is particularly adapted to handle the solid material referred to, since the resilient nature of the rollers protects from them appreciable wear by the pieces of rock passing over them, and at the same time the resilient material of the rollers permits solid pieces which are slightly larger than the desired size to be screened out by the device, to pass through the rollers or between them, whereas if the rollers were of rigid material, pieces of this particular size would frequently clog the screen and reduce its efficiency.

By my invention I further provide a construction of roller such that the roller may be built-up in sections, to the end that the grooves in the rollers may be given any desired width and depth, although if preferred the roller may be molded in a single piece, with grooves of the desired size formed in it. In addition, I provide cleaning fingers which

enter the grooves and remove from them the solid material carried by said grooves through the screen. The resilient rollers are preferably mounted on ball bearings so that they will turn freely, and in this manner effectively carry the fine solid material deposited in their grooves, through the screen so that the same may be removed by said fingers.

My invention will best be understood by reference to the accompanying drawing showing a preferred embodiment thereof, in which

Fig. 1 illustrates my improved screen applied in plan view to a sluiceway to constitute a grizzly,

Fig. 2 is a vertical, sectional view of the parts shown in Fig. 1 taken along the line 2—2,

Fig. 3 is a vertical, longitudinal, sectional view to an enlarged scale through one of the rollers shown in Fig. 1, taken along the line 3—3,

Fig. 4 is a front elevation to an enlarged scale, of one of the bearing brackets employed to support the bearings for the rollers, and

Fig. 5 is a sectional view to a further enlarged scale, of a part of the construction shown in Fig. 3, taken along the line 5—5.

Similar numerals refer to similar parts throughout the several views.

As shown in Figs. 1 and 2, a sluiceway is illustrated at 10, in which a mixture of water and solid material is flowing in the direction indicated by the arrow 11. A plurality of rollers 12 of resilient material are mounted transversely of the sluiceway 10 across its bottom, so that the solid pieces and particles above a predetermined size, flowing down the sluiceway 10 will pass over the rollers and cause them to rotate, while pieces or particles of the solid material which are smaller than the predetermined size and are flowing adjacent the bottom of the sluiceway, will pass between and through the rollers, together with a certain quantity of the water flowing through the sluiceway, into a trough 13 by which the so derived undercurrents may be led to any desired point for subsequent treatment. The rollers 12 are supported to turn

freely in suitable bearings carried by bearing brackets 14, secured to the sides of the sluiceway 10 in any suitable manner not shown. The rollers 12 are each provided
 5 with a plurality of grooves 12a for receiving the relatively fine solid material intended to pass through the screen, and the rollers are preferably separated by an amount substantially equal to the width of the grooves 12a.
 10 As illustrated in Fig. 2, fingers 15 are mounted below the rollers 12 in the grooves 12a to remove from the grooves, pieces or particles of solid material that may be deposited in the grooves from the mixture flowing over the
 15 screen. It will be understood, that with the application of my improved screen to the purpose illustrated in Figs. 1 and 2, the mixture of water and solid material flowing in the sluiceway must have substantial velocity to move the relatively large and heavy
 20 pieces of solid material down the sluiceway. As a result, the engagement of the large pieces of material with the rollers, causes them to rotate in the directions indicated by the arrows in Fig. 2, and this rotation serves
 25 two purposes; first, abrasion of the rollers is avoided, since they move with the solid material engaging them, and second, the rotation imparted to the rollers, carries the finer solid material in the grooves 12a, through
 30 the screen for engagement with the fingers 15, by which the finer solid material is removed from the rollers and delivered to the trough 13.

35 Each of the rollers 12 is preferably constructed as shown in Fig. 3. As shown in this figure, a plurality of disks 12b of resilient material, for example soft rubber, are mounted on a shaft 16, these disks being held in
 40 spaced relation by intermediate disks 12c which preferably are thinner than the disks 12b and of smaller diameter than said disks 12b. The disks 12c are preferably of resilient material, for example soft rubber, although
 45 if desired they may be of rigid material, for example metal. Outside of the end disks 12b, metal disks 12d are placed on the shaft 16, the entire assembly being pressed together by nuts 17 engaging threaded portions near the
 50 ends of the shaft 16. Outside of the nuts 17, the shaft 16 is of reduced diameter as shown at 16a, to receive ball bearings 18 supported in mounting plates 19 of rectangular form, which plates 19 are in turn supported at their
 55 upper and lower edges by channels in supporting bars 14 constituting the framework of the bearing brackets above referred to. The lower bars 14, have secured to their outer side walls, brackets 20 supporting below the
 60 roller, a shaft 21 extending substantially parallel with the shaft 16 to support the fingers 15. It will be noted that each of the fingers 15 is supported on the shaft 21 separately from the other fingers on said shaft,
 65 to the end that the fingers may be moved lon-

gitudinally on the shaft 21 to accommodate different thicknesses of the disks 12b. As shown in Fig. 5, each finger 15 is preferably carried by a supporting block 22 having a bore which is a sliding fit on the shaft 21,
 70 said block being provided with a set screw 23 to secure it in desired position on the shaft 21. The shaft 21 is preferably provided with a keyway 21a extending from end to end of said shaft, and each block 22 is preferably provided
 75 with a key 22a which is a sliding fit in the keyway 21a. The brackets 20 are preferably provided with set screws 24 for rigidly holding the shaft 21 in said brackets 20.

80 As shown in Fig. 4, the bars 14 forming the framework of either of the bearing brackets, are held together at their ends by bent bars 25 and 26 by suitable screws as indicated. To provide any desired separation between the
 85 rollers 12, the plates 19 are held in spaced relation by filler plates 27 in the channels in the bars 14, and adjacent the bent bar 26, a filler plate 28 is preferably disposed, to receive the clamping pressure of the screws 29
 90 threaded through the bent bar 26 to tightly clamp the parts in the channels in the bars 14, against each other and against the bent bar 25. When it is desired to change the spacing
 95 of the rollers from each other, the screws 29 are loosened, the bent bar 26 is loosened and swung from the ends of the channeled bars 14, permitting the filler plates and the mounting
 100 plates 19 to be moved from the bearing bracket and other filler plates to be inserted as required to give the desired separation of the rollers.

While I have shown my invention in the particular embodiment above described, it will be understood that I do not limit myself
 105 to this exact construction as I may employ equivalents known to the art at the time of the filing of this application without departing from the scope of the appended claims.

What I claim is:

1. In a screen, the combination of a plurality
 110 of rollers, each of said rollers consisting of a plurality of first disks of resilient material of substantially the same diameter and thickness, a plurality of second disks of resilient
 115 material of smaller diameter than said first disks and of a thickness substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass
 120 through the screen, a supporting shaft, said first disks and said second disks being mounted coaxially and alternately on said shaft, nuts on said shaft holding said disks tightly
 125 together, and bearings supporting said shaft, said rollers being separated substantially the thickness of said second disks.

2. In a screen, the combination of a plurality
 130 of rollers, each of said rollers consisting of a plurality of first disks of resilient material of substantially the same diameter and thickness, a plurality of second disks of re-

- silient material of smaller diameter than said first disks and of a thickness substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass through the screen, a supporting shaft, said first disks and said second disks being mounted coaxially and alternately on said shaft, nuts on said shaft holding said disks tightly together, bearings supporting said shaft, said rollers being separated substantially the thickness of said second disks, bearing plates for each of said shafts, channelled bars supporting opposite edges of said plates, filler plates supported by said bars between said bearing plates, members across the ends of said bars holding them in parallel relation, and clamping devices for holding said bearing plates and said filler plates tightly against each other.
3. In a screen, the combination of a plurality of rollers, each of said rollers consisting of a plurality of first disks of resilient material of substantially the same diameter and thickness, a plurality of second disks of resilient material of smaller diameter than said first disks and of a thickness substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass through the screen, a supporting shaft, said first disks and said second disks being mounted coaxially and alternately on said shaft, nuts on said shaft holding said disks tightly together, bearings supporting said shaft, said rollers being separated substantially the thickness of said second disks, bearing plates for each of said shafts, channelled bars supporting opposite edges of said plates, filler plates supported by said bars between said bearing plates, members across the ends of said bars holding them in parallel relation, and clamping devices for holding said bearing plates and said filler plates tightly against each other, said shaft bearings comprising ball-bearings carried by said bearing plates.
4. In a screen, the combination of a plurality of rollers, each of said rollers consisting of a plurality of first disks of resilient material of substantially the same diameter and thickness, a plurality of second disks of smaller diameter than said first disks and of a thickness substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass through the screen, a supporting shaft, said first disks and said second disks being mounted coaxially and alternately on said shaft, nuts on said shaft holding said disks tightly together, and bearings supporting said shaft, said rollers being separated substantially the thickness of said second disks.
5. In a screen, the combination of a plurality of rollers of resilient material mounted for rotation in parallel relation and separated by an amount substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass through the screen, shafts supporting said rollers, bearing plates for each of said shafts, channelled bars supporting opposite edges of said plates, filler plates supported by said bars between said bearing plates, members across the ends of said bars holding them in parallel relation, and clamping devices for holding said bearing plates and said filler plates tightly against each other.
6. In a screen, the combination of a plurality of rollers, each of said rollers consisting of a plurality of first disks of resilient material of substantially the same diameter and thickness, a plurality of second disks of resilient material of smaller diameter than said first disks and of a thickness substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass through the screen, a shaft for each of said rollers supporting said first and second disks in alternate arrangement thereon, means carried by each of said shafts for holding the corresponding disks thereon, and bearings supporting said rollers in parallel relation.
7. In a screen, the combination of a plurality of rollers, each of said rollers consisting of a plurality of first disks of resilient material of substantially the same diameter and thickness, a plurality of second disks of smaller diameter than said first disks and of a thickness substantially equal to the maximum smallest dimension of pieces of material of largest size intended to pass through the screen, a shaft for each of said rollers supporting said first and second disks in alternate arrangement thereon, means carried by each of said shafts for holding the corresponding disks thereon, and bearings supporting said rollers in parallel relation.
- In witness whereof, I hereunto subscribe my name this 23rd day of May, A. D. 1930.
- CHARLES B. ULRICH.