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R. C. NEWHOUSE

ROLL GRIZZLY

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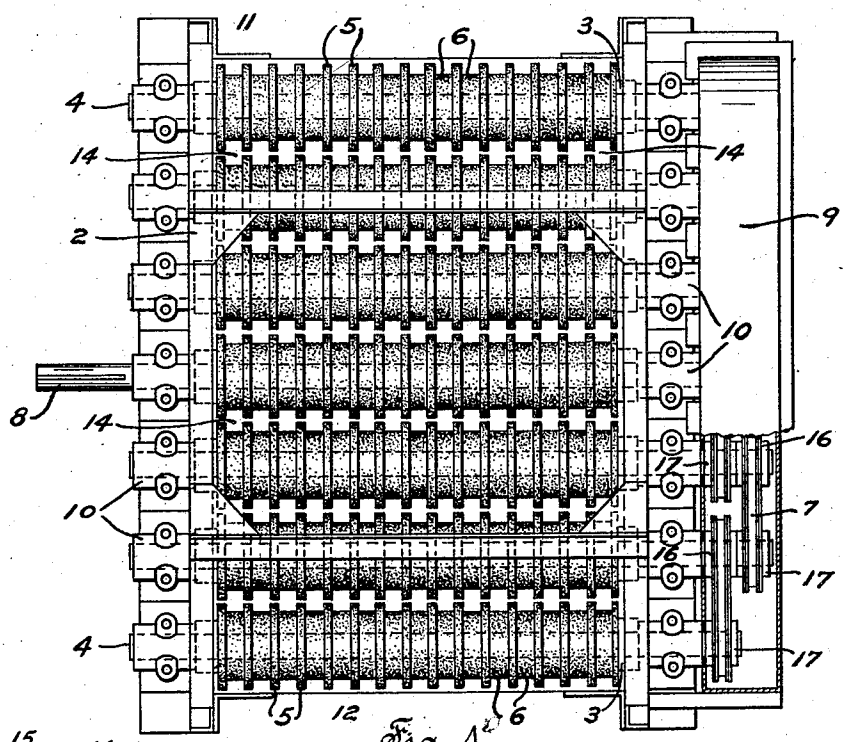


Fig. 1

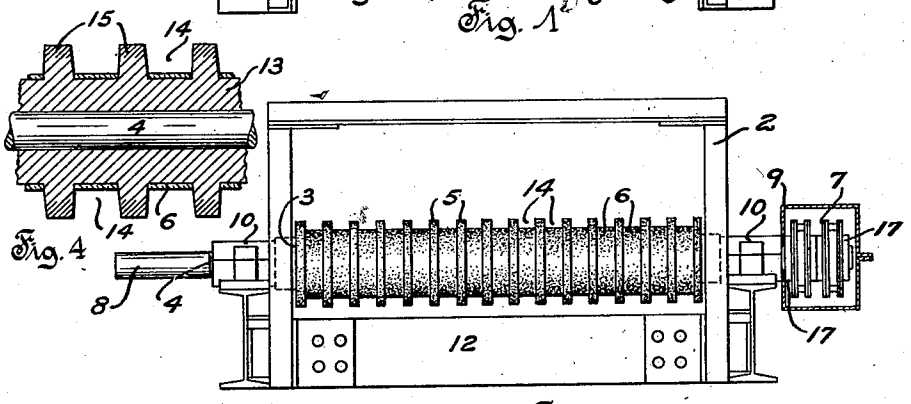


Fig. 4

Fig. 2

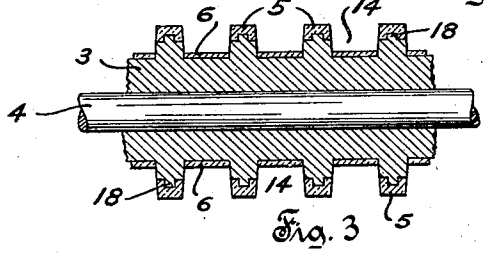


Fig. 3

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ROLL GRIZZLY.

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This invention relates in general to improvements in the art of grading solids as to size, and relates more specifically to improvements in the construction and operation of roll grizzlies for effecting automatic separation of coarse from relatively fine material constituting a mixture.

An object of the invention is to provide an improved multiple roll grizzly which is simple in construction and efficient in operation.

It is common practice to utilize multiple roll grizzlies to effect separation of coarse from relatively fine materials. The ordinary multiple roll grizzly comprises a series of cooperating parallel, horizontal grooved rolls rotatable in the same direction but at differential speeds. The series of rolls is slightly inclined transversely of the roll axes, and the speed of rotation of the rolls increases slightly toward the bottom of the incline. The grooves of adjacent rolls cooperate to form separating openings and the cooperating ridges between the grooves run fairly close to each other but preferably do not touch. The rolls are made of metal and have relatively hard and incompressible coacting surfaces.

With these prior roll grizzlies, it frequently happens that a piece of material becomes jammed between the oppositely moving surfaces of adjacent rolls by virtue of the fact that the delivering roll has a better grip on the piece of material than is momentarily obtained between the piece of material and the receiving roll. This jamming action obviously tends to damage the roll surfaces and to produce breakage. By virtue of the relatively hard and incompressible conveying surfaces of the rolls, these surfaces tend to wear very rapidly thus requiring frequent replacements of the rolls in order to maintain uniform grading. The relatively hard and smooth surfaces of the rolls of the prior grizzlies also tend to reduce to a minimum the friction grip between the rolls and the material thereby reducing to a minimum the rate of feeding and hence the capacity of such grizzlies.

The present invention contemplates provision of a resilient surfaced roll for multiple roll grizzlies which besides being more durable, because of the improved wearing qualities of the surfacing material, will tend to prevent jamming of pieces of material therebetween. In accordance with the improvement the rolls, or at least the surfaces of the roll grooves, are faced with resilient material such as rubber. Such a facing besides resisting abrasion, enhances the friction between the material to be transported over the grizzly, thus more effectively urging the material from one roll to another and enhancing to a maximum the capacity and efficiency.

A clear conception of several embodiments of the invention and of the operation of devices constructed in accordance therewith, may be had by referring to the drawing accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a top view of the improved multiple roll grizzly.

Fig. 2 is an elevation of the improved grizzly looking toward the discharge end thereof in the plane of the roll axes.

Fig. 3 is a fragmentary central longitudinal section through one form of the improved grizzly roll.

Fig. 4 is a fragmentary longitudinal section through another form of improved grizzly roll.

The multiple roll grizzly specifically illustrated in the drawing, comprises in general a series of cooperating parallel horizontal rolls 3, 13 having cooperating grooves 14 and ridges therebetween forming sizing openings. The rolls 3 are mounted in a suitable main frame 2 and have their axes lying in a common plane which is inclined downwardly from the feed end 11 to the discharge end 12 of the grizzly. One of the medial rolls 3 is mounted upon a main driving shaft 8 while the remaining rolls 3 are mounted upon driven shafts 4, the shafts 4, 8 being supported in suitable bearings 10 in the main frame 2. The corresponding ends of the roll shafts 8, 4 are interconnected by means of motion transmitting mechanism which may consist of chains 7 cooperating with sprockets 16, 17, or may be any other type of motion transmitting mechanism. The sprockets 16, 17 are of different size, the arrangement being such that the uppermost roll 3 is rotated at a lower speed than the next succeeding roll 3 and that the speed gradually increases toward the discharge end 12. The driving mechanism is preferably

housed within a suitable enclosing casing 9 which is freely removable for inspection purposes. The rolls 3 are all adapted to be rotated in the same direction at their respective speeds, and the material admitted is automatically advanced from the feed end 11 toward the discharge end 12.

As specifically shown in Figs. 1, 2 and 3, the grooves 14 are covered with rubber facings 6 and the ridges betwen the grooves are likewise covered with rubber facings 5, the facings 5 being provided with internal grooves fitting over peripheral tongues 18 on the roll ridges. As specifically shown in Fig. 4, the ridges between the grooves 14 of the roll 13 have their peripheral portions 15 chilled but the grooves 14 are provided facings 6 as in Fig. 3. The rubber utilized to form these facings is preferably a relatively soft material and if desired alternate rolls may be of the form shown in Fig. 3 while intermediate rolls may be of the form shown in Fig. 4.

During normal operation of the grizzly the mixed material which it is desired to grade is delivered in bulk upon the roll 3 at the feed end 11 of the grizzly, the rolls 3 being rotated in the same direction and at differential speeds by means of power applied through the shaft 8 and the mechanism consisting of the chain 7 and sprockets 16, 17. Due to the rotation of the rolls the material is gradually urged toward the discharge end 12 and is agitated sufficiently to permit all of the particles which are small enough to pass through the openings formed by the grooves 14, to gravitate therethrough. The oversize material continues to cascade from one roll to another until the discharge end 12 is reached, whereupon this material is discharged into a suitable chute or bin, segregated from that which receives the fine material. Due to the resilient covering of the rolls, breakage thereof is eliminated by virtue of the fact that if a delivering roll tends to carry a piece of material downwardly between the cooperating surfaces of two of the rolls, the piece of material will be embedded in the receiving roll which will quickly urge the piece in the direction of its own rotation thereby removing it from contact with the delivering roll. The use of rubber furthermore eliminates excessive wear due to abrasion and enhances the capacity of the grizzly by virtue of the increased friction between the rubber coating and the material.

It is especially desirable to cover the roll grooves with resilient facings while the ridges between the grooves 14 may either be faced as shown in Fig. 3 or may be of any other formation including that disclosed in Fig. 4. It will also be obvious that the ridges may if desired, be omitted to produce a single sizing space of uniform cross-section between each pair of rolls.

It should be understood that it is not desired to limit the invention to the exact details of construction and operation herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. A grizzly comprising a plurality of rolls rotatable in the same direction about parallel axes to convey material thereover transversely of said axes, said rolls having cooperating grooves faced with rubber and forming material sizing openings between the adjacent rolls, and the rubber facings being formed to yieldingly engage and to urge large pieces of hard material over the successive rolls.

2. A grizzly comprising a plurality of rolls rotatable in the same direction about parallel axes to convey material thereover transversely of said axes, said rolls having cooperating grooves and ridges between said grooves providing a series of material sizing openings between each set of rolls, and the bottoms of said grooves and the tops of said ridges being faced with rubber.

3. A grizzly comprising a plurality of rolls rotatable in the same direction to convey material thereover, said rolls having cooperating grooves and ridges between said grooves providing a series of material sizing openings between each set of rolls, and only the bottoms of said grooves and the tops of said ridges being faced with rubber.

4. A grizzly for separating large pieces of hard material from fines, which comprises, a plurality of fluted rolls rotatable at different speeds in the same direction and having spaces therebetween for permitting free gravitation of the fines while retaining the large pieces upon the rolls, said rolls having rubber facings formed to yieldably engage and to thereby grip the large pieces of material so as to urge said pieces rapidly over the upwardly exposed surfaces of the successive rolls.

5. A grizzly for separating large pieces of hard material from fines, which comprises, a plurality of rolls rotatable in the same direction and having spaces therebetween for permitting free gravitation of the fines while retaining the large pieces upon the rolls, said rolls having rubber facings formed to yieldably engage and to thereby grip the large pieces of material so as to urge said pieces rapidly over the successive rolls.

In testimony whereof, the signature of the inventor is affixed hereto.

RAY C. NEWHOUSE.