

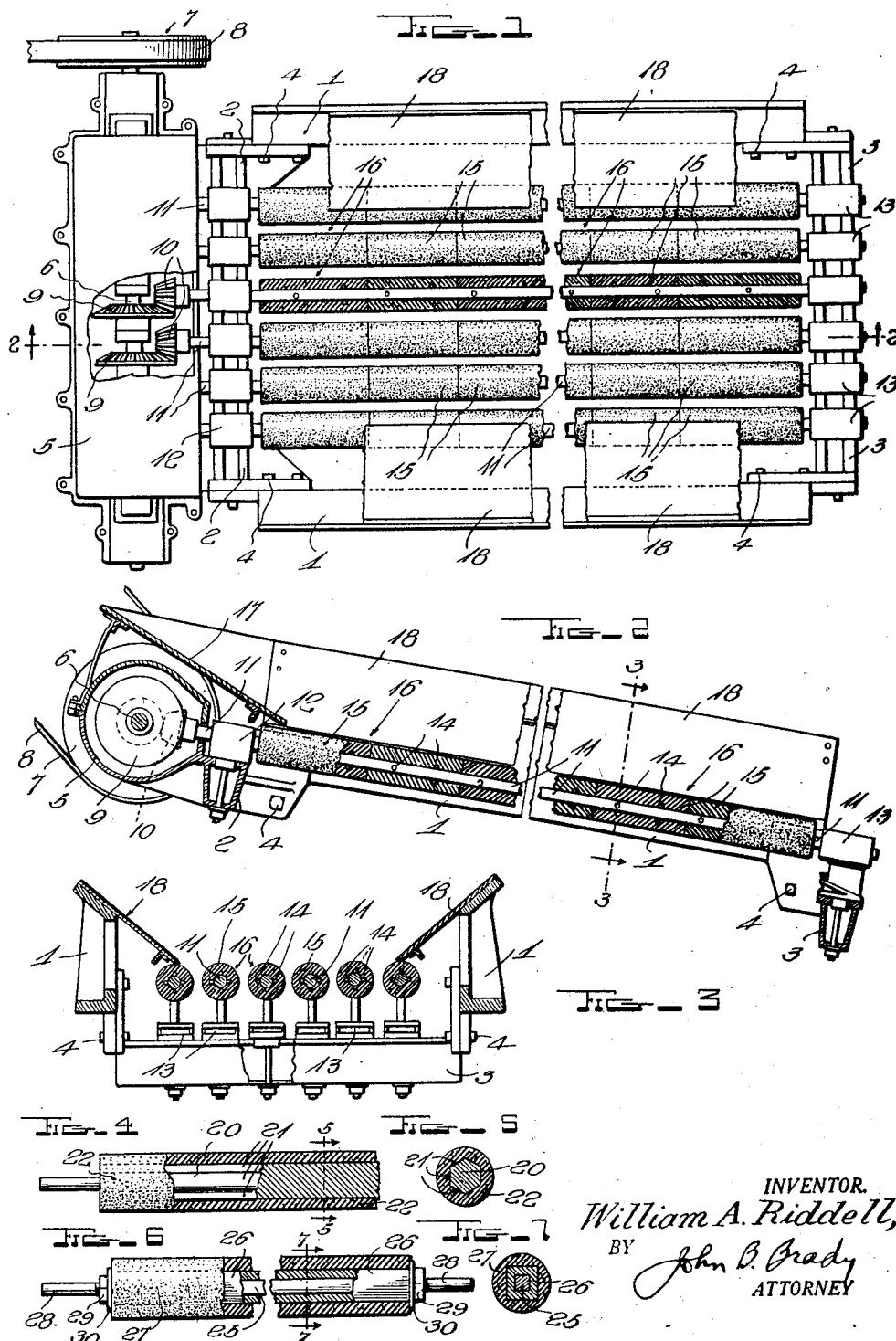
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SEPARATING OR CLASSIFYING MACHINE

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SEPARATING OR CLASSIFYING MACHINE.

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My invention relates broadly to separating or classifying machines for grading material into selected sizes and more particularly to a construction of classifying machine employing roller members having wear resisting surfaces constructed for operation with material of differing characteristics.

One of the objects of my invention is to provide a separating machine having a plurality of longitudinally extending spaced roller members which are provided with wear resisting surfaces for preventing wearing of the rollers under the continued abrasive action of the material which is passed over the rollers.

Another object of my invention is to provide a construction of separating machine in which a plurality of longitudinally extending rollers are provided and sections of wear resisting material secured over the rollers along the length thereof for preventing excessive wear and the destruction of individual rollers through long and continued use of the separating machine.

Still another object of my invention is to provide a construction of separating or classifying machine where a plurality of adjustably spaced apart rollers are provided with renewable surface members which may be removed or placed upon the rollers from time to time for preserving the efficient operation of the machine.

A further object of my invention is to provide a construction of roller member for separating or classifying machines in which a wear resisting envelope may be readily inserted over the roller member for protecting the roller member against wear and enabling the surface of the roller member to be renewed from time to time to avoid the necessity of replacing an entire roller member which normally becomes necessary after extended use of the separating machine.

My invention will be more clearly understood from the following specification by reference to the accompanying drawings, wherein:

Figure 1 is a plan view illustrating the construction of the separating or classifying machine of my invention; Fig. 2 is a longitudinal cross-sectional view taken on line 2—2 of the separating or classifying machine illustrated in Fig. 1; Fig. 3 is a lateral cross-sectional view taken along line 3—3 of the

separating machine as illustrated in Fig. 2; Fig. 4 is a detail fragmentary view partially in cross-section through one of the longitudinal roller members illustrating one method of securing the wear resisting envelope over the surface of the rollers; Fig. 5 is a cross-sectional view of the roller construction illustrated in Fig. 4 taken on line 5—5 thereof; Fig. 6 is a view of one of the rollers partially broken away and in section illustrating a modified construction by which the wear resisting envelope may be secured over the roller member; and Fig. 7 is a cross-sectional view through the roller member of Fig. 6 taken on line 7—7 thereof.

I have found that the usual steel rollers of a separating or classifying machine, after having once been set in spaced relationship tend to wear away under the continued abrasive action of the material passing through the coal separator and ultimately it becomes necessary to replace an entire roller. These replacements are inherently expensive and inconvenient and where spares are not immediately available, result in undersired shut down of the machinery with resulting overhead expense. By my invention, I provide a plurality of removable sections which form envelopes for the rollers of the classifying machine and which may be readily replaced from time to time as they become worn. I construct the removable sleeve members of various materials according to the character of the substance upon which the classifying machine is being operated. I may employ white iron sections, graphited sections, vulcanized rubber or other tenacious forms of material may be used to secure the desired operation of the classifying machine according to the character of the substance under treatment. In using rubber as a covering for the rollers, I find an added advantage accruing in the operation of the machine by reason of the yieldable characteristics of the material, permitting passage of slightly oversize particles of the substance which is being operated upon by the classifying machine.

Referring to the drawings in more detail, reference character 1 designates a pair of side frames which have secured thereto, adjacent their extremities, front bearing carrier 2 and rear bearing carrier 3 by any suitable means such as bolts 4. The frame is provided at the front bearing carrier 2 with an

extension 5 for housing the dust and dirt proof shaft member 6 journaled in bearings carried by the frame of the classifying machine. The shaft member 6 is driven by a belt 8 which passes over the pulley 7 or any other suitable driving source may be provided where it may be more expedient. The shaft member 6 within the gear case housing 5 carries bevel gears 9 keyed thereon which mesh with bevel gears 10 on the extremities of rotatable shaft members 11. The rotatable shaft members 11 are journaled in bearings 12 in the front bearing carrier 2 and in bearings 13 in the rear bearing carrier 3. The shaft members 11 are provided with roughened or irregular shaped surfaces or with projections 14 extending therefrom in different directions along the length thereof. These projections 14 engage the inner surfaces of the sectional sleeve members 15 which form the longitudinally extending rollers 16. The rollers 16 are spaced apart throughout their length for distances determined by the setting of the sets of adjustable bearings 12 and 13 in the front bearing carrier 2 and the rear bearing carrier 3, in accordance with the desired grading or size of the material which is operated upon by the classifying machine. A hopper is provided over the rollers 16 by means of side plates 18 and the chute 17. The rollers are normally positioned in an inclined plane so that material which is distributed over the rollers tends to travel downwardly and be discharged into a concentrated mass in the lower end of the classifying machine. The undersize material drops between the rollers under the continued agitation and rotative movement thereof. In order to secure the wear resisting surface sections 15 on the longitudinally extending shaft members 11 various forms of retaining means may be provided between the shaft members and the rollers. In Fig. 4, I have shown a modified form of section for one of the shaft members where a polygonal cross-section 20 is provided with surfaces 21 which lock with correspondingly shaped inner surfaces of the wear resisting envelope 22. In Fig. 6 I have illustrated another method of constructing the longitudinally extending rollers where the shaft 28 is screw threaded adjacent its opposite ends and provided with a square cross-section 25 intermediate the screw threaded portions. A square sleeve member 26 fits over the square shaft member 25 and carries the wear resisting material 27 which is securely locked upon the shaft member by means of nut and washer members 29 and 30 engaging the screw threaded portions of the shaft 28.

It will be observed that white iron coverings for the rollers may be readily placed upon or removed from the rotatable shaft members by merely removing one of the shaft members from its bearings. Sections of the

rollers may therefore be renewed from time to time at slight expense and the efficiency of the separating machine may thereby be maintained at a high standard. The various sections of the wear resisting and yieldable surfaces may be interlocked in various ways.

The construction of classifying machine illustrated in the drawings has been found to be very practical in the separating of coal into selected sizes. While the apparatus as shown has been particularly designed for use as a coal separator it will be understood that the machine may be applied to the separation of various materials wherever it is necessary to selectively grade material into different sizes.

I have illustrated certain preferred embodiments of the invention, but I desire that it be understood that modifications may be made and that no limitations upon the invention are intended other than those imposed by the scope of the appended claims.

What I claim and desire to secure by Letters Patent of the United States is as follows:

1. A separating or classifying machine comprising in combination a frame, a plurality of rotatable shaft members journaled in said frame and extending longitudinally therein in spaced relationship, sleeve members having irregularly shaped surfaces and a plurality of wear-resisting tubular members having a plurality of independent aligned sections positioned over said sleeve members for directly engaging the material which is deposited upon the classifying machine.

2. In a separating or classifying machine the combination of a frame structure, a plurality of rotatable shaft members journaled longitudinally in said frame structure, a drive shaft journaled transversely in said frame structure for imparting rotative movement to said shaft members, sleeve members enveloping said shaft members and having exterior gripping surfaces thereon and a plurality of independent sections constituting removable wear-resisting surfaces secured upon said sleeve members for directly contacting with material to be classified during the passage thereof over said shaft members.

3. In a separating or classifying machine the combination of a frame structure, a plurality of members each polygonally shaped in cross-section journaled longitudinally in said frame structure, means for imparting rotative movement to said members, sleeve members extending over said aforementioned members and having inner bores corresponding to the shape of the external surfaces of said aforementioned members and wear-protecting surfaces extending over each of said sleeve members for preventing direct contact between the material which is to be classified and said polygonally shaped mem-

bers during the operation of said classifying machine.

4. In a separating or classifying machine the combination of a frame structure, a plurality of roller members journaled longitudinally in said frame structure, means for imparting rotative movement to said roller members, sleeve members having their inner bores keyed to said roller members and wear-protecting surfaces constituted by a plurality of independent sections extending over each of said sleeve members, said sections of said wear-protecting surfaces enveloping said roller members and having means between the inner surface of each of the sections thereof, and the outer surface of said roller members for preventing relative rotative movement between said wear-protecting surfaces and said sleeve members, said wear-protect-

ing surfaces preventing abrasive action of the material being classified against said roller members.

5. In a separating or classifying machine a frame structure, a plurality of longitudinally extending rotatable rod members journaled in said frame structure, each of said rod members being hexagonal in cross section, and a plurality of independent sections of wear resisting material enveloping said hexagonal shaped rod members, each of said sections having a substantially cylindrical surface arranged to form an extended cylindrical roller, said sections of material being aligned upon said rod members for presenting wear resisting surfaces to material deposited over said members.

In testimony whereof I affix my signature.

WILLIAM A. RIDDELL.