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W. A. RIDDELL

SEPARATING OR CLASSIFYING MACHINE

Filed Feb. 2, 1926

FIG. 1

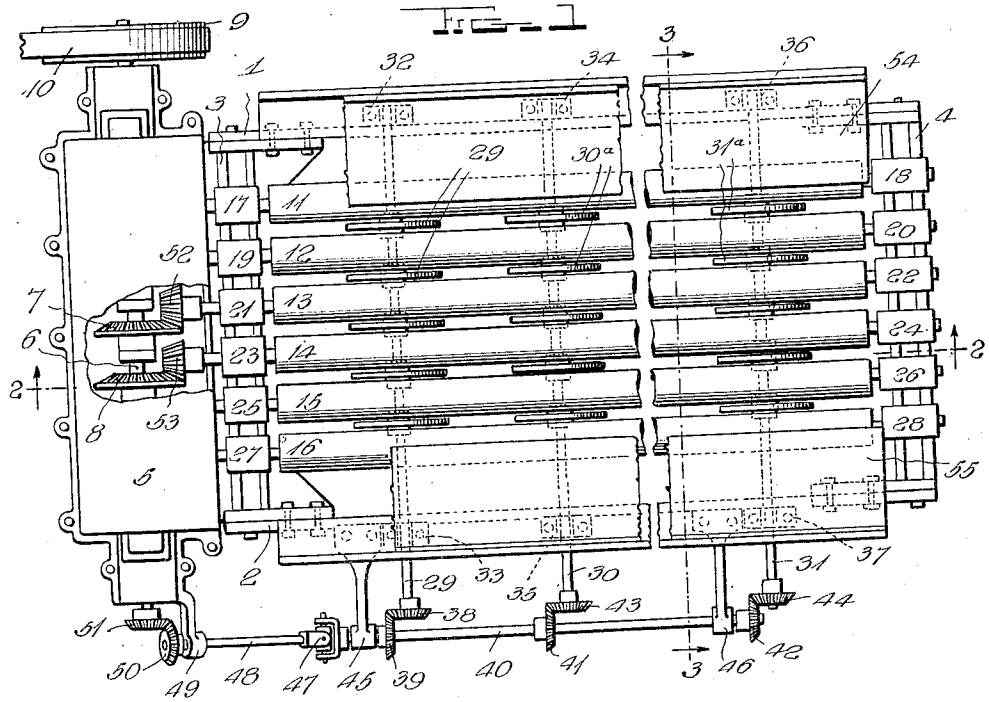



FIG. 2

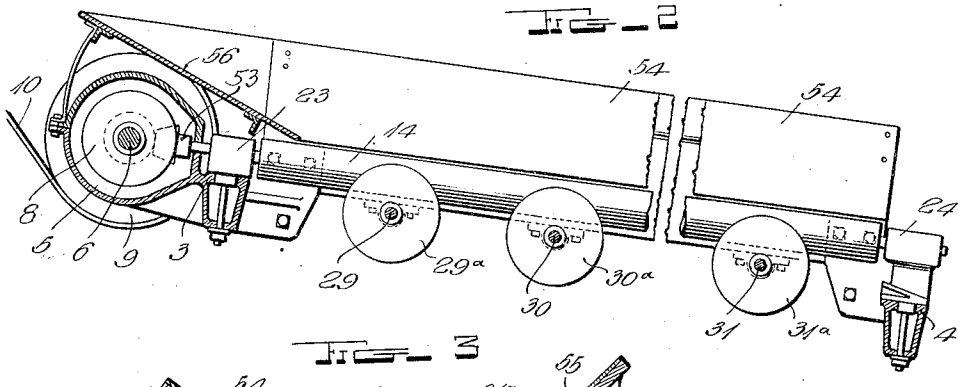
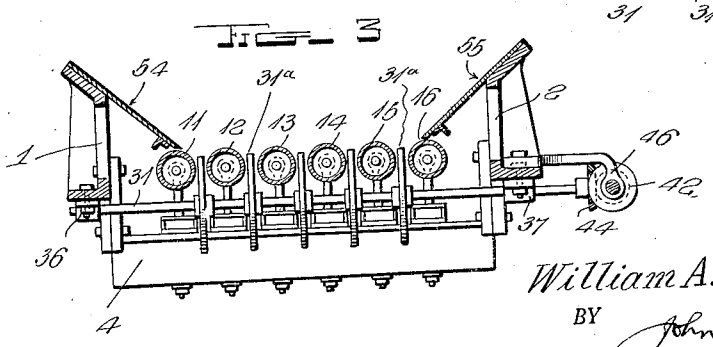



FIG. 3




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# UNITED STATES PATENT OFFICE.

WILLIAM A. RIDDELL, OF FREDERICK, MARYLAND.

## SEPARATING OR CLASSIFYING MACHINE.

Application filed February 2, 1926. Serial No. 85,551.

My invention relates broadly to classifying or separating machinery and more particularly to a construction of classifying machine in which material is passed over a plurality of driven rollers which operate to pass material of a desired size while depositing material of oversize into a concentrated mass.

One of the objects of my invention is to provide a separating or classifying machine having a plurality of driven rollers adjustably spaced from one another with means for preventing clogging of the rollers by material lodging between the rollers in the course of the passage of the material over the rollers.

Another object of my invention is to provide a classifying machine having a plurality of spaced roller members with means located between the roller members at spaced intervals along the length therefor for continuously agitating material which may become wedged between the rollers of the classifying machine.

Still another object of my invention is to provide a construction of separating or classifying machine having a plurality of longitudinally extending agitator members located between the rollers for freeing the machine from any tendency of the material which is passed through the separating machine from clogging between the rollers.

A further object of my invention is to provide a construction of classifying machine having a frame for supporting a plurality of longitudinally extending roller members and a plurality of laterally extending shaft members with cutting disk devices which project upwardly between the rollers for clearing the gaps therebetween of material which may tend to clog the space between the rollers with means for driving the rollers and clearing disks from the same source of power.

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

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

Referring to the drawings in more detail, reference characters 1 and 2 designate longitudinally extending frame members which have laterally extending frame members 3 and 4 connected thereto. A gear case 5 is located at one end of the frame for housing a laterally extending drive shaft 6 and a plurality of bevel gear members keyed thereon as represented at 7 and 8. The laterally extending drive shaft 6 is journaled in bearings supported from the frame of the classifying machine and a drive pulley 9 is provided which may be driven from any suitable source of power such as belt member 10. The separating or classifying machine is provided with a plurality of longitudinally extending rollers represented at 11, 12, 13, 14, 15 and 16 which are journaled at opposite ends in bearing members which are adjustably positioned in the laterally extending frame members 3 and 4. As illustrated in the drawing, bearings 17 and 18 are provided for the opposite ends of the roller member 11. Bearings 19 and 20 are provided for the opposite ends of roller member 12. Similarly, bearings 21 and 22 are provided for the opposite ends of roller member 13. In a corresponding manner the roller member 14 is journaled at opposite ends in bearings 23 and 24. Roller member 15 is journaled in bearings 25 and 26 at opposite ends thereof and likewise roller member 16 is journaled in bearings 27 and 28 at opposite ends thereof. The manner of adjusting the bearing members at opposite ends of the rollers has been described more particularly in my copending application Serial No. 74,501, filed December 10, 1925. It will be sufficient to point out that the gaps between the roller members may be set by means of a suitable gauge and the bearings adjusted along the laterally extending frame members to a desired location dependent upon the size of the material which is to be passed through the separating or classifying machine. Extending laterally across the frame of the separating or classifying machine I provide a plurality of rotatable shaft members which have been illustrated in the drawings at 29, 30 and 31. While I have illustrated but three of these shaft members, it will be understood that any desired num-

ber may be provided at spaced intervals along the length of the roller member 11, 12, 13, 14, 15, and 16. These shaft members are journaled in bearings carried by the longitudinally extending frame members. For example, the shaft member 29 is journaled in bearings 32 and 33; shaft member 30 in bearings 34 and 35; and shaft member 31 is journaled in bearings 36 and 37. Each of the shaft members extends beyond the frame of the classifying machine and is provided with means for rotatably driving the several shafts from the source of power delivered by the drive pulley 9. Shaft 29 is provided with a bevel gear 38 which meshes with a bevel gear 39 keyed on longitudinally extending shaft 40. The shaft 40 also carries bevel gears 41 and 42 meshing with bevel gears 43 and 44 respectively for imparting rotative movement to the laterally extending shafts 29, 30 and 31. The shaft 40 is journaled in bearings 45 and 46 which project from the longitudinally extending frame member 2. The end of shaft 40 is coupled through a universal joint 47 with a rotatable drive shaft 48 journaled in bearing 49 and provided on its extremity with bevel gear 50 which meshes with the bevel gear 51 carried by drive shaft 6. By this arrangement power delivered at pulley 9 is utilized to drive each of the rollers 11, 12, 13, 14, 15 and 16 through bevel gear connections with bevel gears 7 and 8 as has been illustrated by way of example at 52 and 53 at the same time that shafts 29, 30 and 31 are rotating. The shaft members 29, 30 and 31 carry agitator members or sets of cutting disks $29^a$, $30^a$ and $31^a$, respectively. The cutting disks project between the longitudinally extending gaps which separate the roller members and serve to maintain the space between the rollers free from clogging of material which is being operated upon by the classifying machine which might otherwise tend to wedge between the rollers and impair the operation of the machine. The sets of disks $29^a$, $30^a$, and $31^a$ may be provided with cutting side surfaces or edges to more adequately cut away material which may clog between the rollers.

I provide a hopper supported from the frame members consisting of the inclined longitudinally extending plate members 54 and 55 and an end plate member 56 for directing the material which is to be classified in a downward direction over the rollers. As illustrated in the drawings the classifying machine is disposed on an incline permitting material of desired size to be passed through the rollers and oversize material is discharged over the end of the machine into a concentrated mass. I have found this invention particularly applicable for the separation of coal, but I desire that it be understood that the machine may be used for any purposes where it is desired to classify material into different predetermined sizes.

While I have described my invention in a certain preferred embodiment, the agitator members may be varied in size and shape and I desire that it be understood that other modifications of the structure may be made without departing from the spirit of my invention as set forth in the appended claims.

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

1. In a separating or classifying machine, the combination of a frame, a plurality of longitudinally extending rollers journaled in said frame, means for driving said rollers, a plurality of rotatable means positioned laterally with respect to the axes of said rollers and arranged to prevent the clogging of material between said rollers, said plurality of means being driven from said first mentioned means in timed relation to the rotation of said rollers, whereby material to be separated may be deposited over said rollers and material of a predetermined size passed between said rollers, while the gaps between the rollers are maintained free from clogging of said material.

2. A separating or classifying machine comprising in combination a frame structure, a plurality of longitudinally extending roller members journaled in said frame structure, driving means at one end of said frame structure for imparting rotative movement to said roller members, a plurality of laterally extending shaft members journaled in said frame structure, means extending from said driving means at the end of said frame structure for imparting rotative movement to said laterally extending shaft members and agitator devices carried by said laterally extending shaft members and arranged to pass between said roller members for maintaining the space therebetween free from clogging of material which is being classified, said agitator members being operative in timed relation to the rotation of said roller members.

3. A separating or classifying machine comprising in combination a frame structure, a plurality of longitudinally extending roller members journaled in bearings adjustably positioned in opposite ends of said frame structure, driving mechanism located at one end of said frame structure for imparting rotative movement to said roller members, a plurality of laterally extending rotatable shaft members journaled in said frame structure, means for imparting rotative movement to said shaft members from said driving mechanism, a plurality of agitator disks carried by said rotatable shaft members and arranged to be moved between said longitudinally extending roller members for maintaining the space between said roller mem-

bers free from clogging by material which is being classified, said disk being operated in timed relation with respect to the rotation of said rollers.

4. A separating or classifying machine comprising in combination a frame structure, a plurality of longitudinally extending roller members journaled in bearings adjustably positioned in opposite ends of said frame structure, driving mechanism located at one end of said frame structure for imparting rotative movement to said roller members, a plurality of laterally extending rotatable shaft members journaled in said frame structure, means for imparting rotative movement to said shaft members from said driving mechanism, and means actuated by rotation of said shaft members for maintaining the gaps between said roller members free from clogging of material which is being classified, said means operating in timed relation to the rotation of said roller members.

5. In a separating or classifying machine, the combination of frame, a plurality of longitudinally extending rollers journaled in said frame, means for driving said rollers, said rollers being spaced apart throughout their length, and agitator members arranged to project between said rollers and substantially fill the gaps therebetween and rollers operating to maintain the gaps between said rollers longitudinally of the length thereof, free from clogging by material which is being classified, said agitator members operating in timed relation to the motion of said rollers.

In testimony whereof I affix my signature.

WILLIAM A. RIDDELL.