

Oct. 17, 1944.

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2,360,562

DISINTEGRATOR ROTOR

Filed Sept. 24, 1943

2 Sheets-Sheet 1

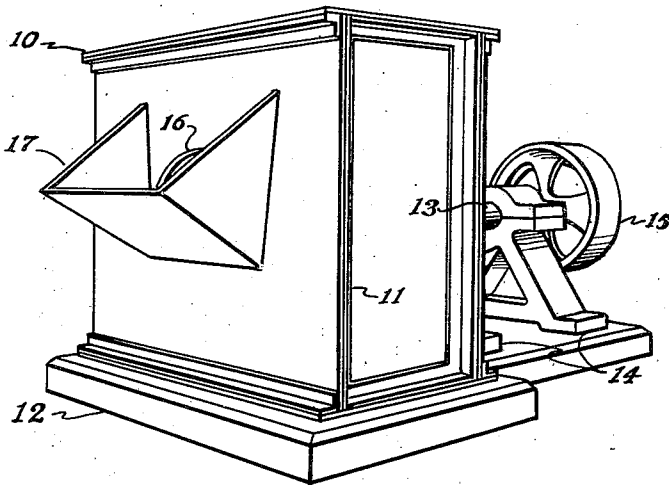


Fig. 1

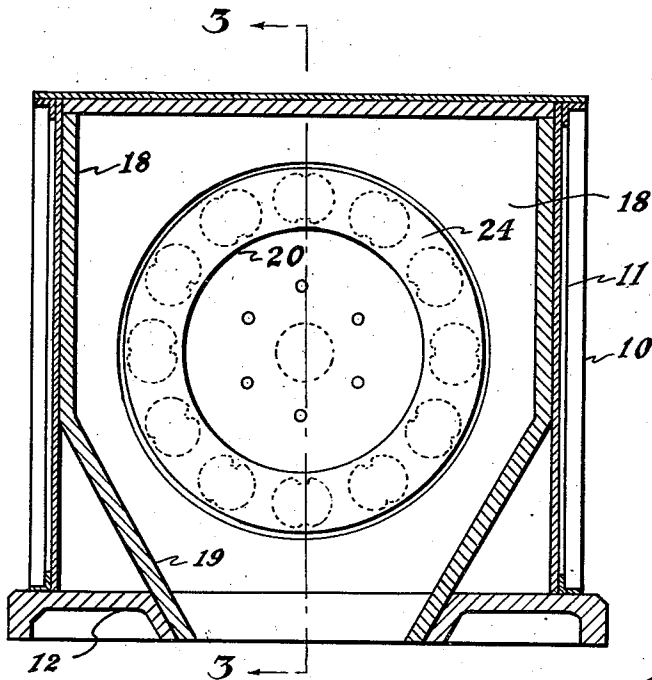


Fig. 2

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2 Sheets-Sheet 2

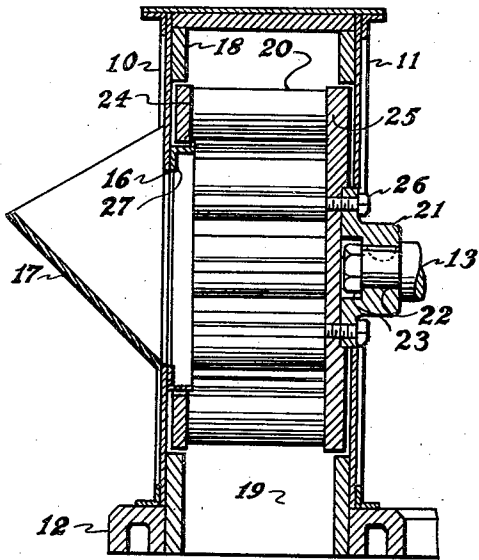


Fig. 3

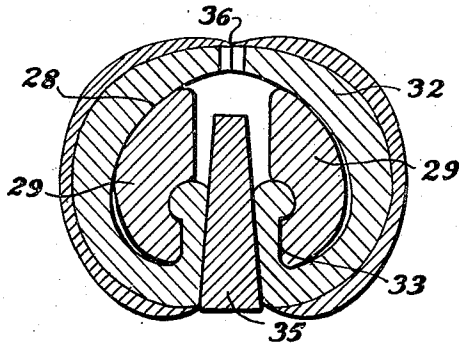


Fig. 5

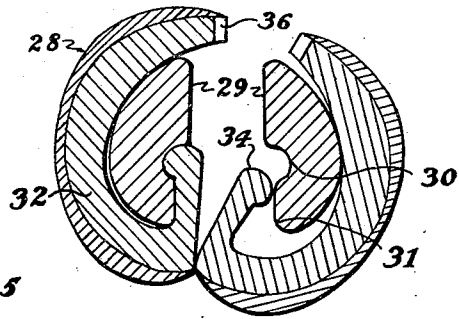


Fig. 6

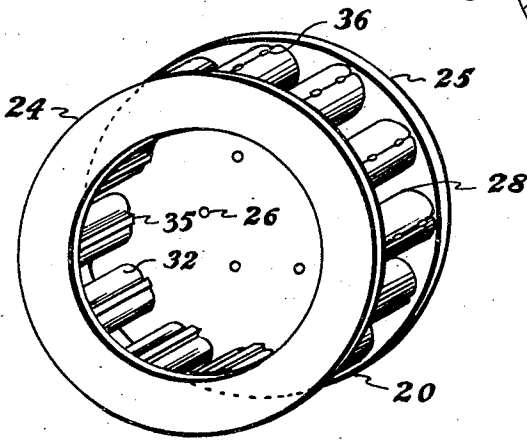


Fig. 4

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DISINTEGRATOR ROTOR

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Application September 24, 1943, Serial No. 503,611

8 Claims. (Cl. 83—11)

The invention relates to new and useful improvements in disintegrator rotors.

One object of the invention is to provide an improved disintegrator rotor having means removably mounted upon its impact pins or bars for protecting the latter from wear, the removability of the means permitting ready replacement thereof.

An important object of the invention is to provide an improved disintegrator rotor having its impact pins surrounded by wear members, whereby the pins are unexposed to frictional or contact wear and merely function to support the members.

A particular object of the invention is to provide an improved disintegrator rotor, of the character described, wherein the wear members are frictionally locked to the impact pins in such a manner that the impact of the material being disintegrated tends to assist the frictional locking of said members and to prevent accidental displacement thereof.

Another object of the invention is to provide an improved disintegrator rotor, of the character described, wherein each wear member includes semi-cylindrical segments and each impact pin is split longitudinally with its halves spaced apart for receiving portions of the segments, there being wedge means interposed between the adjacent portions of said segments for urging the same into snug engagement with the pin halves and each other, whereby the segments are prevented from being displaced by their coaction with each other and the wedge means.

A further object of the invention is to provide an improved disintegrator rotor, of the character described, wherein the enlarged end of the wedge means is exposed to the interior of the rotor and the impact of the material being disintegrated whereby said means is constantly urged into and maintained in wedging position, there being access to the reduced end of the wedge means to facilitate the ready removal of the same.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is an isometric view of a disintegrator, Figure 2 is a transverse, vertical, sectional

view of the disintegrator showing a rotor, constructed in accordance with the invention, in elevation,

Figure 3 is a transverse, vertical, sectional view, taken on the line 3—3 of Figure 2,

Figure 4 is an isometric view of the rotor,

Figure 5 is an enlarged, transverse, sectional view of one of the impact pins of the rotor, showing the locking arrangement of the wear segments, and

Figure 6 is a view, similar to Figure 5, with the wedge member removed and one of the wear segments partially removed.

In the drawings, the numeral 10 designates a disintegrator which includes an upright, substantially rectangular housing or casing 11 mounted upon a suitable base 12 and secured thereto by bolts, welding or other means. A drive shaft 13 is journaled within blocks or brackets 14 carried by the base 12 and has a drive pulley or fly-wheel 15 mounted on one end thereof. If desired, the pulley 15, a V-belt pulley or sprocket (not shown), may be secured on the shaft 13 between the blocks 14. An opening 16, preferably circular, is formed in the forward or front wall of the housing and communicates with an inclined feed chute or trough 17 which is welded or otherwise secured to the exterior of said forward wall. The housing is lined internally with a plurality of relatively thick, heavy plates 18 which are bolted, welded or otherwise secured to the walls of said housing in the usual manner. As is clearly shown in Figure 2, the liner plates which are secured to the housing end walls converge at their lower end to provide a hopper 19 for discharging the disintegrated material through the open bottom of the housing and base. It is noted that the liner plates 18 extend below the housing into the base and may be secured thereto. The foregoing construction is more or less conventional and forms no part of the present invention.

As shown in Figure 3, the inner end of the shaft 13 projects through an opening in the rear wall of the housing and is secured to a rotor 20 of the cage type by means of an offset, flanged collar or hub 21. For fastening the hub to the shaft, the inner end portion of said shaft is reduced in diameter to provide a shoulder 22 and said hub is keyed or otherwise connected to this reduced portion in abutting relationship to the shoulder 22. A nut 23 is screw-threaded upon the extremity of the reduced shaft portion to confine the hub thereupon and in engagement

with the shoulder, the hub being recessed to receive the nut.

The rotor 20 is preferably a one-piece casting and includes a pair of flat, side plates 24 and 25 which are in axial alinement with each other and preferably with the shaft 13 and opening 16. The plate 24 is annular, while the plate 25 is preferably circular and is secured to the flange of the hub 21 by a plurality of stud bolts 26 so as to enclose and protect the nut 23 and the end of the shaft 13 from wear. It is noted that the liner plates 18 which are secured to the forward and rear walls of the housing are cut away to receive the plates of the rotor, which plates are disposed in close proximity to said walls. An annular deflecting ring 27, angular in cross section, telescopes within the annular plate 24 and is secured to the internal surface of the forward wall of the housing so as to surround the opening 16 thereof, whereby all of the material fed into the chute 17 and through said opening is directed into the interior of the rotor 20.

The plates 24 and 25 of the rotor are joined by a plurality of transverse impact pins or bars 28 preferably made integral therewith and disposed in parallel relationship at suitable uniform intervals about the circumference of said plates. As is clearly shown in Figures 5 and 6, each pin 28 includes a pair of identical, longitudinal sections 29 which are substantially semi-circular in cross-section. The sections are disposed in spaced, parallel relationship with their flat surfaces opposed in substantially radial alinement with the axis of the rotor. A longitudinal, co-extensive groove or channel 30, semi-circular in cross-section, is formed in the inner, flat surface of each section immediately below the center or axis thereof and the portion of said surface below the groove is offset outwardly as shown at 31 so as to reduce the transverse width of the lower portion of the section. It is also desirable to round or bevel the lower portions 31 to a greater extent than the upper portions of the sections.

A complementary, substantially semi-cylindrical segment or shield 32 is adapted to be engaged around each section of each pin 28, whereby a pair of the segments coact to enclose said pin. As is clearly shown in Figures 3 and 4, the segments are co-extensive with the pin sections and have their ends engaging the internal surfaces of the side plates 24 and 25 of the rotor. Each segment has its lower or inner end portion bent inwardly upon itself at substantially a right angle to provide an upstanding, longitudinal tongue or flange 33. When a segment is positioned upon one of the sections 29, its flange 33 will extend in an outwardly direction in the space between the pair of sections, which space is of sufficient width to accommodate the flange as well as insertion and removal thereof. The upper end portion of the flange is enlarged to form a longitudinal, rounded bed or key 34 which is complementary to and adapted to engage within the groove 30 of the section upon the proper positioning of the segment. A longitudinal, tapered wedge member 35 is adapted to be driven into the space between the flanges 33 of the segments so as to maintain the same in their engagement with the inner, flat surfaces of the sections and thereby lock said segments in position around said sections. When the segments are so positioned, the outer or upper edge portions thereof are engaged. It is pointed out that the upper portions of the inner, flat surfaces may only be spaced a sufficient distance

apart to accommodate the reduced end of the wedge member 35.

Upon installing the segments 32, the bead 34 of one segment is engaged within the groove 30 of one of the sections 29 by inserting the flange 33 of said segment through the lower or inner end of the space between said sections. The segment is then swung inwardly toward and around the section so as to assume the position shown at the right of Figure 6. After this positioning of one of the segments, the other segment is inserted in a similar manner as shown at the left of Figure 6 and is then swung inwardly toward and around the other section. The segments will now be in the position shown in Figure 5 with their outer edge portions in engagement with each other. By inserting the wedge member 35 between the flanges 33 and forcing the same into snug engagement with said flanges, the segments will be latched in position around the sections.

In order to facilitate the removal of the segments, several semi-circular recesses or openings 36 are formed in the outer edge portions of said segments to form circular openings when said edge portions are in engagement. A punch or other suitable tool (not shown) may be inserted through these openings and engaged with the outer reduced end of the wedge member for forcing the same from its engagement with the segments. After this displacement of the wedge member, the segments may be removed by swinging first one and then the other outwardly away from its respective section as illustrated in Figure 6. Manifestly, this arrangement facilitates the ready removal and replacement of the segments.

The operation of the rotor is conventional, with the material to be disintegrated being fed into the interior of the rotor or cage 20 through the chute 17 and opening 16. As has been hereinbefore set forth, the deflecting ring 27 directs the material from the opening into the interior of the rotor. The shaft 13 drives the rotor at the desired speed and the material is struck by the impact pins 28, or rather by the segments 32, until reduced or disintegrated to a sufficient fineness to permit escape thereof through the spaces between adjacent pins. The material is further disintegrated by striking the liner plates of the housing and is finally deflected to one of the end walls from where it is dropped through the discharger hopper 19.

Since the wedge members 35 are exposed to the interior of the rotor so as to be subjected to the impact of the material being disintegrated, it is manifest that said wedge members are urged into firmer engagement with the flanges 33 of the segments 32. Due to the opening formed by the recesses 36, the wedge members may be readily displaced in order to permit the removal and replacement of the segments. The latter is an important feature of the invention, because the segments are subject to the greatest amount of abrasive wear. If desired, the segments may be coated with a wear resistant metal, such as "Stellite," in order to increase the wear resistant qualities of the same. It is also possible to remove and replace the liner plates 18 when the same become worn. Thus, it is manifest that the disintegrator may be reconditioned or rebuilt at a minimum expense and within a very short period of time.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the de-

tails of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A disintegrator rotor including, a cage formed of side plates joined by a plurality of spaced transverse members, each member being formed of a pair of spaced longitudinal sections, the sections being substantially semi-circular in cross-section and having substantially flat inner surfaces disposed in adjacent parallel relationship, a complementary impact segment overlying each section and coacting with the overlying segment of the other section to enclose the member, and means for frictionally and removably fastening the segments in position around said sections.

2. A disintegrator rotor including, a cage formed of side plates joined by a plurality of spaced transverse members, each member being formed of a pair of spaced longitudinal sections, the sections being substantially semi-circular in cross-section and having substantially flat inner surfaces disposed in adjacent parallel relationship, a complementary impact segment overlying each section and coacting with the overlying segment of the other section to enclose the member, each segment having a portion interposed between said sections and engaging the flat inner surface of its respective section, and wedge means inserted between the sections and engaging the interposed portions of the segments for urging said segments into snug engagement with their respective sections.

3. A disintegrator rotor including, a cage formed of side plates joined by a plurality of spaced transverse members, each member being formed of a pair of spaced longitudinal sections, the sections being substantially semi-circular in cross-section and having substantially flat inner surfaces disposed in adjacent parallel relationship, a complementary impact segment overlying each section and coacting with the overlying segment of the other section to enclose the member, a flange made integral with each segment and engaging the flat inner surface of its respective section so as to be interposed between said sections, and wedge means inserted between and engaging the flanges to urge the same into snug

engagement with the flat inner surfaces of the sections so as to frictionally latch the segments in position.

4. A disintegrator rotor as set forth in claim 1 wherein the impact elements are formed with openings to permit access to the wedge means for removal thereof.

5. A disintegrator rotor including, a cage formed of side plates joined by a plurality of spaced transverse members, each member being formed of a pair of spaced longitudinal sections, the sections being substantially semi-cylindrical in shape, a complementary impact segment overlying each section and coacting with the overlying segment of the other section to enclose the member, each segment having a portion interposed between said sections and engaging the inner surface of its respective section, coacting means formed on each inner surface and each interposed portion for holding the segments in position, and wedge means disposed between and engaging the interposed portions for frictionally locking said segments in such position.

6. A disintegrator rotor including, a cage formed of side plates joined by a plurality of spaced transverse members having spaced longitudinal sections, impact elements formed of segments mounted upon each member and overlying its sections so as to surround the member, each segment having a portion thereof interposed between said sections, and wedge means engaging the interposed portions of the segments to urge the same into snug engagement with the sections and thereby frictionally latch the elements in position.

7. A disintegrator rotor as set forth in claim 6 wherein the material to be disintegrated is fed to the central portion of the cage, the wedge means being exposed to the interior of said cage and subjected to the impact of the material being disintegrated so as to be constantly urged into frictional latching position.

8. A disintegrator rotor as set forth in claim 1 wherein the material to be disintegrated is fed to the central portion of the cage, the wedge means being exposed to the interior of said cage and subjected to the impact of the material being disintegrated so as to be constantly urged into frictional latching position.

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