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ADJUSTABLE SCREEN FOR HAMMER MILLS

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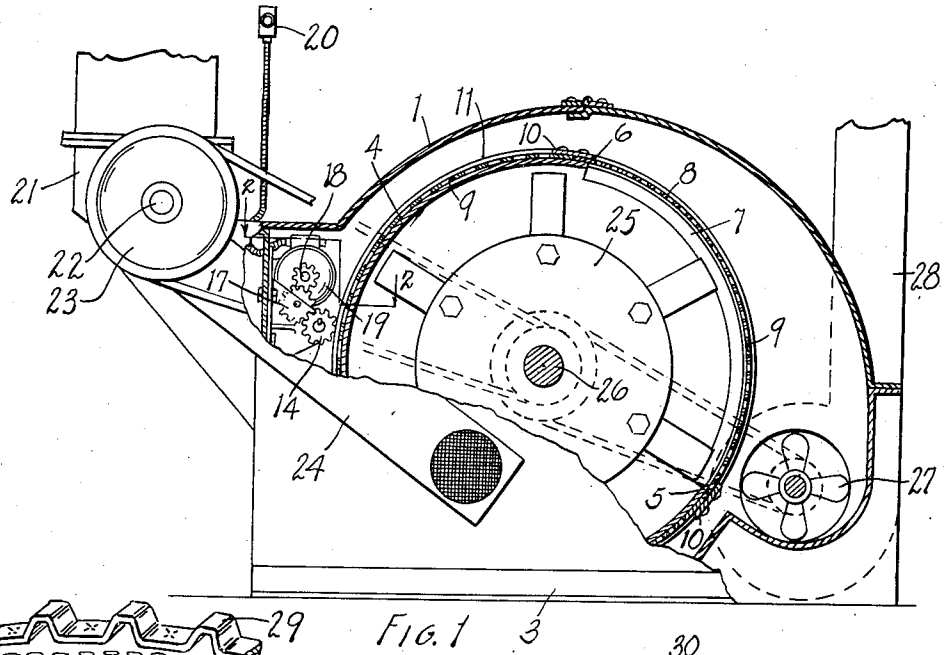


FIG. 1

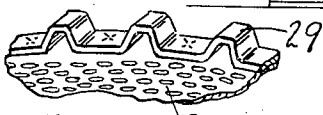


FIG. 7

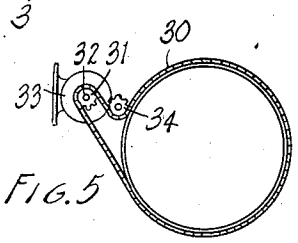


FIG. 5

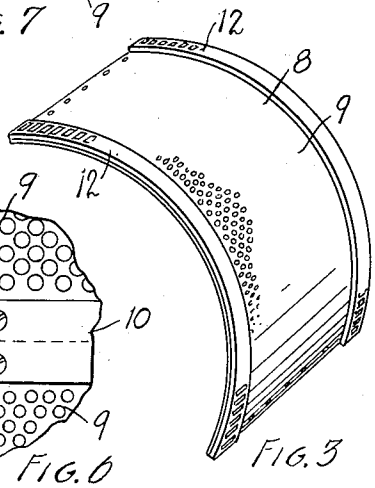


FIG. 3

FIG. 6

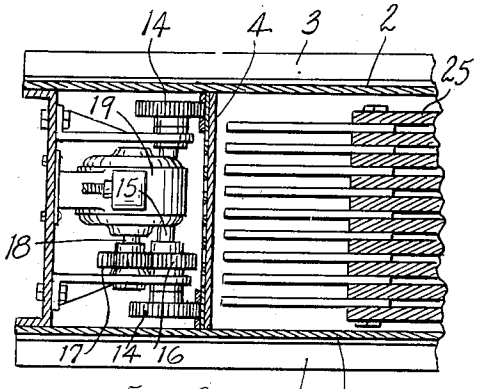


FIG. 2

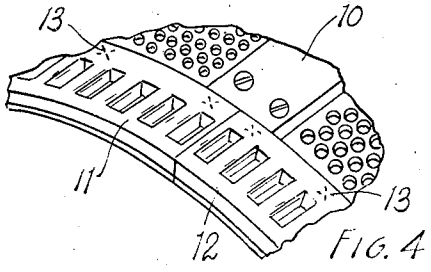


FIG. 4

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ADJUSTABLE SCREEN FOR HAMMER MILLS

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5 Claims. (Cl. 241—89)

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This invention relates to improvements in adjustable screen for hammer mills.

The main objects of this invention are:

First, to provide an improved adjustable screen for a hammer mill, which is highly efficient and may be readily adjusted by remote control, if desired, to vary the fineness of the product.

Second, to provide an improved adjustable screen for a hammer mill which is rotatably supported and comprises segments of different mesh in which all parts of the screen are effectively supported throughout the circumference thereof at all positions of adjustment.

Third, to provide an improved adjustable screen for hammer mills comprising sections of different mesh in which the screen is supported for free rotative adjustment and in a manner to prevent clogging.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary view of a hammer mill embodying my invention partially in vertical section, certain parts being shown conventionally.

Fig. 2 is an enlarged fragmentary view on a line corresponding to the broken line 2—2 of Fig. 1.

Fig. 3 is a perspective view of one of the screen segments.

Fig. 4 is an enlarged perspective view showing structural details of the screen and of the driven rack members.

Fig. 5 is a fragmentary perspective view of a modified form or embodiment of the screen and driving means therefor.

Fig. 6 is a fragmentary plan view of the screen of the embodiment of Fig. 5.

Fig. 7 is a fragmentary perspective view of the screen of the embodiment of Figs. 5 and 6.

The embodiment of my invention illustrated in Figs. 1 to 4 inclusive comprises a casing designated generally by the numeral 1 and having end walls 2 which also constitute end walls for the cylinder. This casing is provided with a suitable base 3.

Within the casing I mount a segmental cylindrically curved cylinder side wall member 4, the details of connection to the end walls not being illustrated. The space between the ends 5 and 6 of this cylinder wall member is bridged by the segmental cylindrically curved screen supports 7

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which are preferably of angle section and secured to the end walls of the casing.

The screen designated generally by the numeral 8 comprises a plurality of segmental sections 9 of different mesh secured together in end to end relation by the tie plates 10 and constituting a complete annular cylinder which embraces the side wall 4 and is supported thereby and by the support members 7 throughout the circumference of the screen, the screen being a rotatable sliding fit on the cylinder.

The screen is provided with annular racks 11 at each edge, these racks being made up of segments 12, the segments being spot welded as indicated at 13 to the screen sections. This results in a substantially rigid annular screen rotatably slidable upon the cylinder and without binding thereon.

The screen is adjusted by means of driving gears 14 meshing with the racks 11, the shaft 15 of the gears being connected by the gears 16 and 17 to the shaft 18 of the motor 19. The motor and this driving connection are preferably arranged within the casing as shown in the drawing. The motor is controlled from the switch 20 which may be remotely located.

The feed hopper 21 is provided with a feed means having a shaft 22 provided with a pulley 23. Feed chutes 24 extend from the feed hopper to each side of the casing, delivering through the end walls of the casing to the cylinder.

The hammer rotor 25 is provided with suitable hammers, this being mounted on the shaft 26.

The casing is provided with a discharge fan 27 delivering to the discharge chute 28.

With this arrangement of parts, the screen may be quickly and easily adjusted to control the fineness of the product. The screen of the embodiment illustrated has three screens of different mesh.

In the embodiment shown in Figs. 5, 6 and 7, driven sprocket members 29 are provided instead of the racks 11. The sprocket chains 30 coact with these sprockets 29, the sprocket chains being driven from the driving sprockets 31 on the shaft 32 of the motor 33. An idler sprocket 34 holds the sprocket chain in effective mesh with the sprocket gears.

I have illustrated and described my invention in practical embodiments thereof. I have not attempted to illustrate or describe other embodiments or adaptations which I contemplate as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a hammer mill, the combination of a casing comprising parallel end walls, a cylinder comprising a segmental cylindrically curved side wall member mounted between said end walls and constituting a screen support, cylindrically curved screen support members mounted on said end walls to bridge the space between the ends of the cylinder side wall and complement said wall member, a substantially rigid cylindrical screen embracing and rotatably supported on said cylinder side wall member and said support members, said screen comprising a plurality of complementary segmental sections of different mesh connected end to end, annular racks at the edges of said screen, rack driving gears mounted within said casing to coact with said racks, said cylinder side wall member supportingly engaging the cylindrical screen inside thereof substantially opposite from said gears to support the screen against thrust away from said gears, a motor having driving connection with said gears, a control switch for said motor, and a hammer rotor mounted within said cylinder, said end walls being provided with inlets for said cylinder.

2. In a hammer mill, the combination of a casing comprising end walls, a segmental cylindrically curved cylinder side wall member extending between and secured to said casing end walls which constitute cylinder end walls, segmental cylindrically curved screen support members secured to said end walls to bridge the space between the ends of said cylinder side wall member, a substantially rigid cylindrical screen rotatably slidable on said cylinder side wall member and supports, said screen being rotatably slidably supported on the cylinder wall member on the side thereof diametrically opposite from said screen support members to facilitate rotatable slidable engagement of said screen with said support members, said screen comprising a plurality of segmental complementary sections of different mesh secured together end to end, annular driven members at the edges of said screen, driving members coacting with said driven members, manually controlled means for driving said driving members, and a hammer rotor within said cylinder.

3. In a hammer mill, the combination of a casing comprising end walls, a segmental cylindrically curved cylinder side wall member extending between and secured to said casing end walls which constitute cylinder end walls, segmental cylindrically curved screen support members secured to said end walls to bridge the space between the ends of said cylinder side wall member, a substantially rigid cylindrical screen rotatably slidable on said cylinder side wall member and supports, said screen being rotatably slidably supported on the cylinder wall member on the side thereof diametrically opposite from said screen support members to facilitate rotatable slidable engagement of said screen with said support members, said screen comprising a plurality of segmental complementary sections of different mesh secured together end to end, means for rotating said screen, and a hammer rotor within said cylinder.

4. In a hammer mill, the combination of a casing, a cylinder comprising a segmental cylindrically curved side wall member constituting a screen support member, segmental cylindrically curved screen support members bridging the space between the ends of the cylinder side wall member, a cylindrical screen embracing and rotatably supported on said cylinder side wall member and said support members, said screen comprising a plurality of segmental sections of different mesh connected end to end, annular racks at the edges of said screen, rack driving gears coacting with said racks, said cylinder side wall member supportingly engaging the cylindrical screen inside thereof substantially opposite from said gears to support the screen against thrust away from said gears, and a hammer rotor within said cylinder.

5. In a hammer mill, the combination of a casing, a cylindrical cylinder disposed in said casing and having a discharge opening at one side, a cylindrical screen, bearing means including said cylinder disposed within and rotatably supporting said screen, said screen comprising a plurality of segmental sections of different mesh to be selectively positioned over said discharge opening, annular racks at the edges of said screen, rack driving gears mounted within said casing to coact with said racks, said bearing means engaging the screen inside thereof substantially opposite from said gears to support the screen against thrust away from said gears, a motor having driving connection with said gears, a control switch for said motor on the outside of said casing, and a hammer rotor within said cylinder, said cylinder being provided with an inlet at an end thereof.

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