Aug. 8, 1950 M. N. DRESSEL 2,517,990

ROTOR FOR HAMMER MILLS

Filed June 5, 1946 2 Sheets-Sheet 1

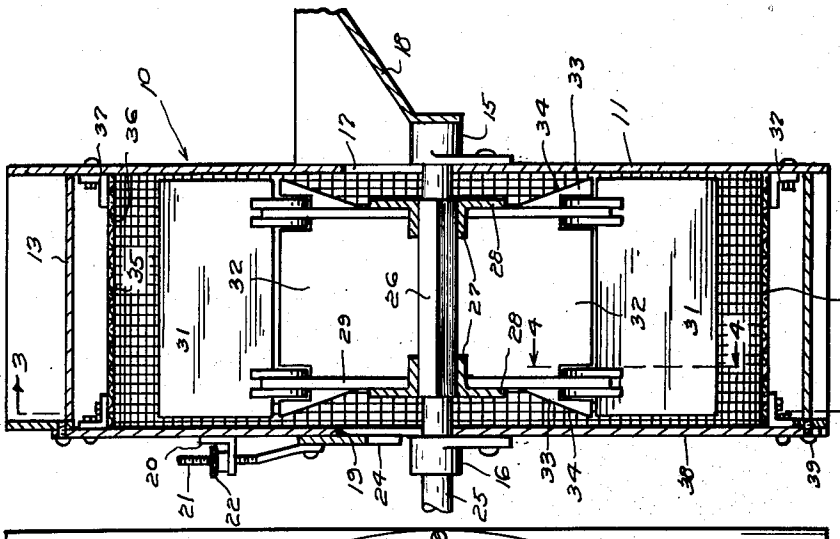


Fig. 2.

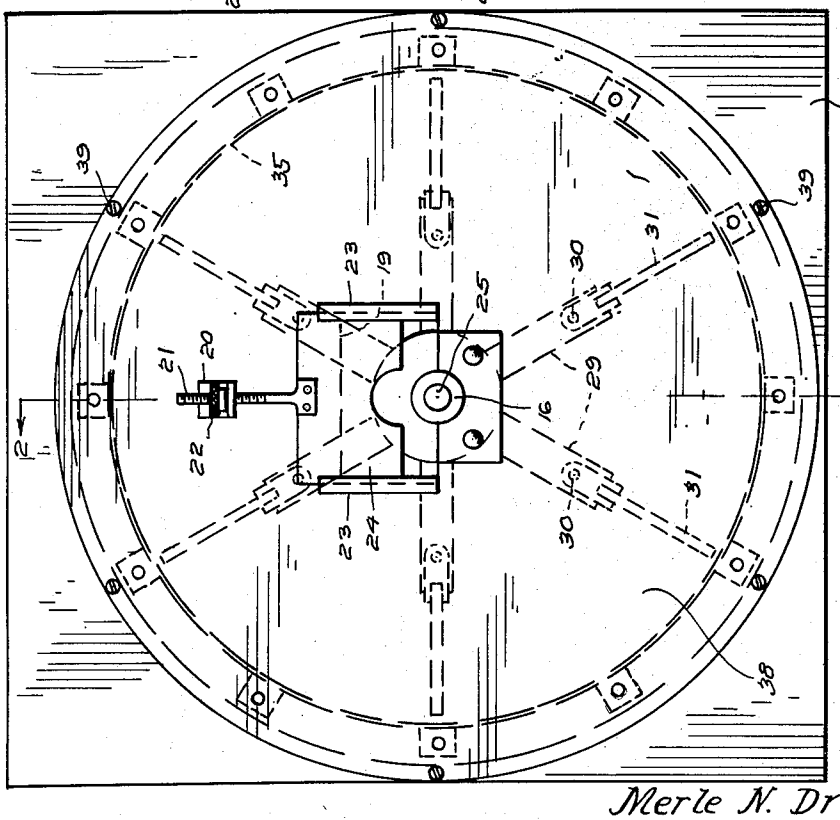


Fig. 1.

Inventor

Merle N. Dressel,

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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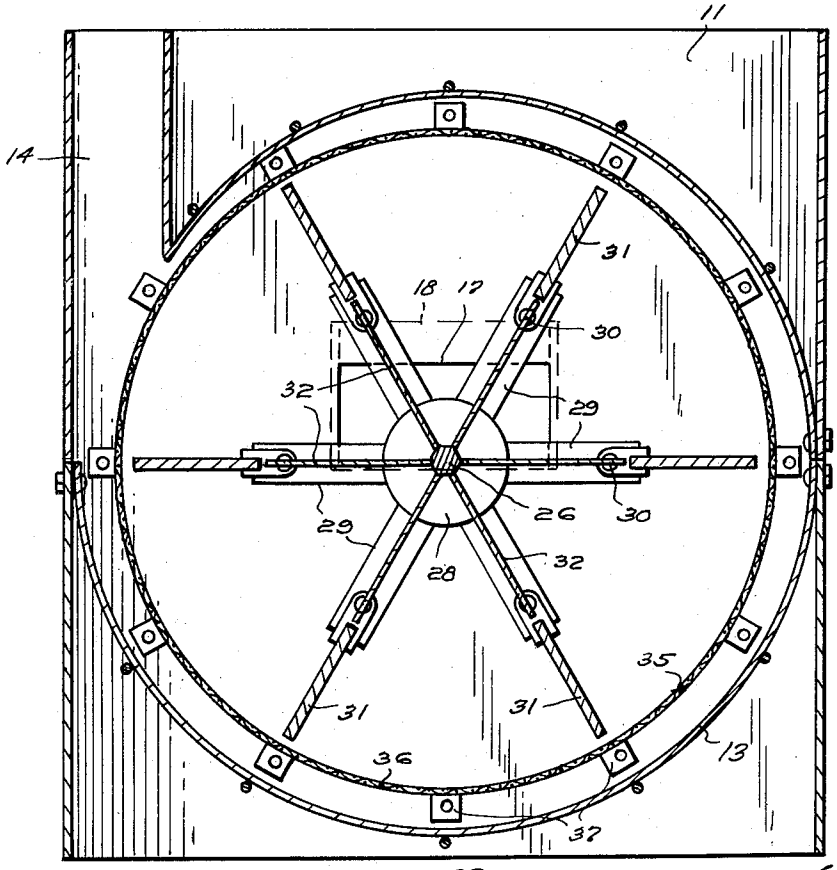


Fig. 3.

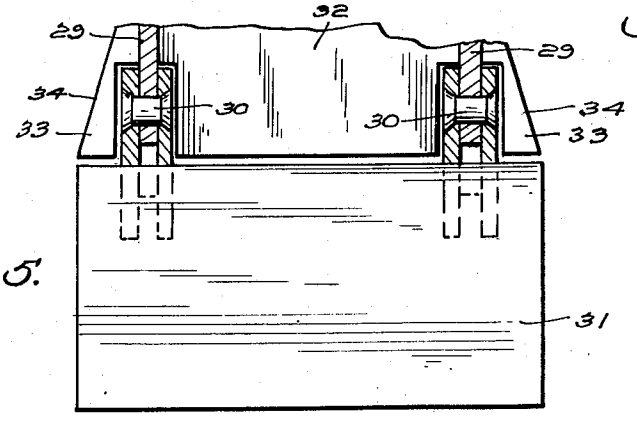


Fig. 5.

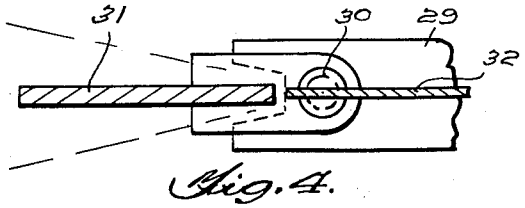


Fig. 4.

Inventor

Merle N. Dressel,

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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UNITED STATES PATENT OFFICE

2,517,990

ROTOR FOR HAMMER MILLS

Merle N. Dressel, St. Cloud, Minn., assignor of one-half to Clarence A. Trossen, St. Cloud, Minn.

Application June 5, 1946, Serial No. 674,528

1 Claim. (Cl. 241—194)

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This invention relates to a hammer mill and more particularly to an improved hammer mill of the type disclosed in my prior patent, No. 2,013,378, issued September 3, 1935.

The primary object of the invention is to pulverize and reduce material to a desired fineness.

Another object is to enable the same device to be employed for producing various grain sizes of the pulverized material.

The above and other objects may be attained by employing this invention which embodies among its features a vertically disposed convolute drum having a peripheral discharge opening and an inlet opening in at least one side wall near the center thereof, a shaft mounted in said drum to rotate about a horizontal axis, a circular cylindrical screen removably mounted in said drum concentric with the shaft, arms radiating from the shaft in the screen and blades pivoted to the arms for cooperation with the screen in pulverizing material introduced into the drum through the inlet opening, said blades also cooperating with the drum casing in creating an air blast through the discharge opening whereby the pulverized material will be ejected from the drum.

Other features include providing the drum with an air intake opening in the side opposite the inlet opening through which the material is introduced, means to regulate the amount of air entering the drum through the air intake opening, and a hopper to feed the material to the drum through the inlet opening.

In the drawings:

Figure 1 is a side view of a hammer mill embodying the features of this invention,

Figure 2 is a vertical sectional view taken substantially along the line 2—2 of Figure 1,

Figure 3 is a vertical sectional view taken substantially along the line 3—3 of Figure 2,

Figure 4 is an enlarged fragmentary sectional view taken substantially along the line 4—4 of Figure 2, and

Figure 5 is a fragmentary elevational view, parts being shown in vertical section, illustrating the relation between the pivoted and fixed blades.

Referring to the drawings in detail, my improved hammer mill designated generally 10 comprises substantially square side plates 11 and 12 held in spaced parallel relation by a convolute wall 13 having a peripheral discharge opening communicating with a discharge duct 14 arranged between the walls 11 and 12, and extending upwardly as illustrated in Figure 3. The side

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wall 11 is provided with a journal bearing 15 which aligns with a journal bearing 16 carried by the side wall 12 and in which the shaft to be more fully hereinafter described is mounted to rotate. Formed in the side wall 11 adjacent the journal bearing 15 is an inlet opening 17 through which the material to be pulverized is introduced into the interior of the drum 10. A suitable hopper 18 is attached to the side wall 11 to direct the material into the inlet opening 17. Formed in the wall 12 opposite the inlet opening 17 is an air intake opening 19 which is valved in a manner to be more fully hereinafter explained.

Attached to the wall 12 above the opening 19 is an angle bracket 20 supporting a vertically movable externally screw threaded shaft 21 carrying a nut 22 by means of which the shaft 21 may be adjusted vertically. Attached to the lower end of the shaft and riding in suitable guides 23 carried on the wall 12 adjacent opposite ends of the opening 19 is a plate 24 by means of which the area of the opening 19 may be varied.

Mounted in the bearings 15 and 16 to rotate about a horizontal axis is a drive shaft 25 which is formed between the bearings 15 and 16 with an area 26 of hexagonal cross section. Driven onto opposite ends of the hexagonal area 26 are hubs 27 carrying adjacent their outer ends flanges 28, and fixed to the hubs 27 and flanges 28 are radial arms 29 carrying adjacent their outer ends pivots 30. Pivotally supported on the pivots 30 are blades 31 which are adapted to cooperate with the screen to be more fully hereinafter described in reducing and pulverizing the material introduced into the interior of the drum. Fixed between each pair of arms 29 is a radial blade 32 and carried on the outer side of each arm 29 is a radially extending knife 33 having an outwardly disposed inclined sharpened edge 34. These knives serve to cut fibrous material introduced into the device and prevent its collection between the arms 29 and the walls 11 and 12, while the radial blades 32 not only serve to create a blast of air through the device but also to prevent the lodging of fibrous material in the space between the arms 29 and the consequent clogging of the machine.

The screen previously referred to is designated generally 35 and comprises a cylindrical foraminous member 36 concentrically disposed with relation to the shaft 25 within the drum 10, and in close proximity to the extreme outer edges of the blades 31. Carried by the foraminous body

36 are spaced radially extending ears 37 which are pierced to receive attaching bolts arranged to extend through an annular row of spaced openings formed in the side wall 11, in order detachably to secure the screen 35 in proper position within the mill.

In the preferred form of the invention the side wall 12 is preferably formed with an enlarged circular opening of diameter to permit the passage of the screen 35 therethrough, and this opening is closed by a cover plate 38 which is removably secured to the wall 12 by spaced screws 39.

In operation, it will be understood that the material is introduced into the drum from the hopper 18 through the passage or inlet opening 17 and the shaft 25 rotated in its bearings 15 and 16. The centrifugal force created by the rotation of the arms 29 and blades 31 will cause the blades to tend to move against the material into a radial position, thus forcibly driving the material against the screen 35 so as to hammer the material until it attains a fineness which will permit it to pass through the foraminous wall 33 and into the passage formed between the convolute wall 13 of the drum and the screen. The rapid rotation of the blades 31 also serves to create a draft of air through the opening 19 to the interior of the drum and thence out through the discharge passage 14. The blast of air thus created is ladened with the pulverized material which enters the passage through the screen 35 and in this manner the pulverized material is also discharged through the passage 14 from whence it may be delivered for storage or packaging and shipment.

From the foregoing it will be obvious that I not only utilize the centrifugal force of the blades 31 to pulverize the material introduced into the drum, but also these blades serve in the capacity of the impellers of a blower so as to pick up the pulverized material and discharge it from the device. Obviously screens 35 of varying degrees of fineness may be employed and by the simple

expedient of removing the bolts from the ears 37 it is apparent that the screen readily may be changed.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination, and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

I claim:

In a hammer mill, a rotor comprising a rotatable shaft, circumferentially spaced pairs of longitudinally spaced arms on said shaft, blades pivotally connected to each pair of arms, laterally extending blades carried by each of said arms disposed beneath said pivoted blades and inclined outwardly and radially from the axis of rotation, and radial blades fixedly secured to and disposed between each pair of arms beneath said pivoted blades.

MERLE N. DRESSEL.

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