Jan. 20, 1931. R. B. ELDERKIN 1,789,583

FEED GRINDER

Filed May 13, 1929

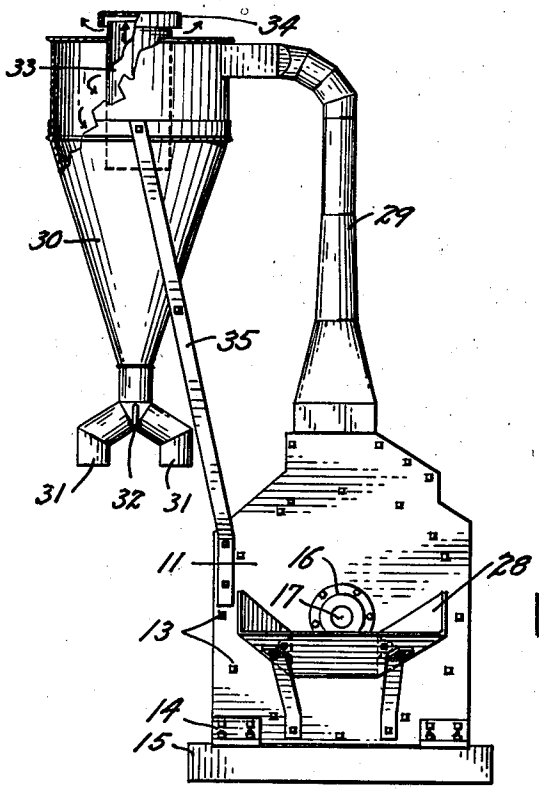


Fig 1

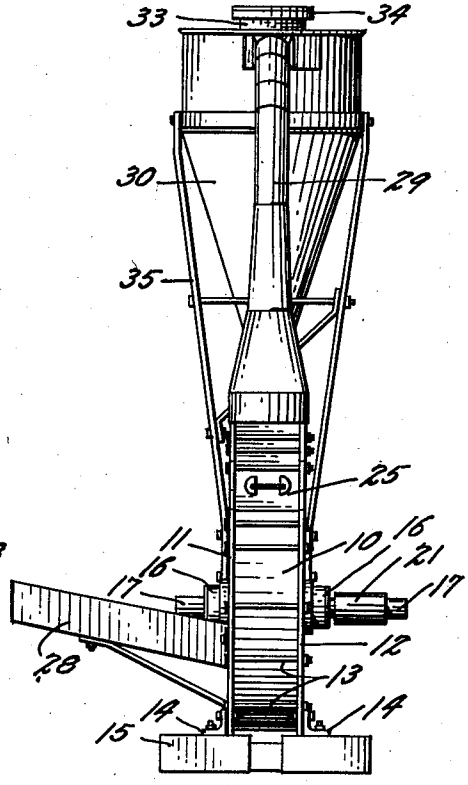


Fig 2

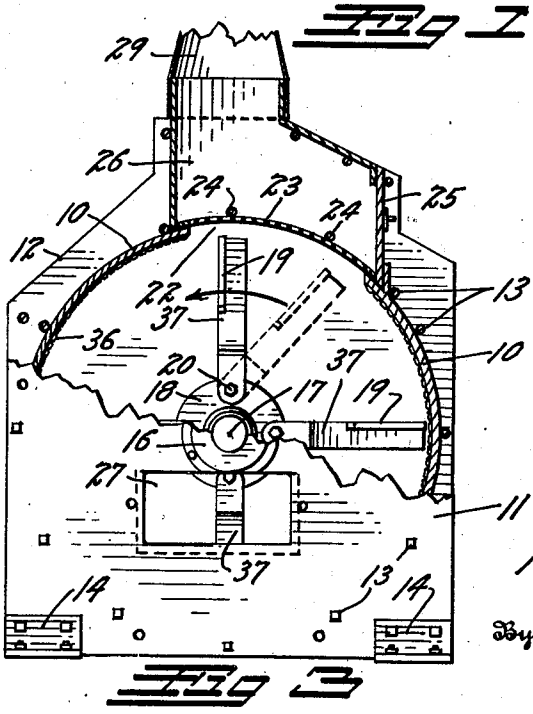


Fig 3

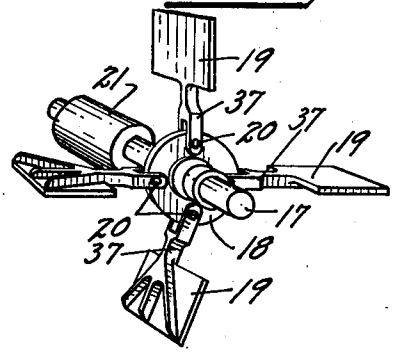


Fig 4

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UNITED STATES PATENT OFFICE

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FEED GRINDER

Application filed May 13, 1929. Serial No. 362,494.

This invention relates to a grinder for grinding live stock feed and the like and has for its principal object the provision of a simple grinding mechanism which will grind any type of grain or fodder, such as corn on the stalk, alfalfa, beans, etc., without it being necessary to shell or thresh the grain.

Another object of the invention is to so construct the grinder that it will automatically act as an elevator to elevate the ground feed or fodder into silos, storage bins, and the like without additional mechanism.

Still another object of the invention is to so construct the device that all fine material will be recovered and all atmospheric dust will be eliminated.

A further object of the invention is to provide grinding mechanism which will not be damaged should pieces of metal, rocks, etc., be accidentally introduced.

A still further object of the invention is to provide a grinder which can be quickly and easily adjusted to grind to differing degrees of fineness.

Other objects and advantages reside in the detail construction of the invention which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 illustrates a side elevation of the invention with the dust collector partially broken away.

Fig. 2 is an end elevation thereof.

Fig. 3 is a side elevation of the grinding portion of the device with the feed hopper removed and the side plate partially broken away to illustrate the interior mechanism.

Fig. 4 is a detail perspective view illustrating the rotor of the grinder.

Construction

The invention comprises a relatively narrow cylindrical housing 10 which is closed at its two sides by means of a front plate 11 and a back plate 12. The interior of the housing 10 is preferably roughened or toothed as indicated at 36, Fig. 3. The front and back plates 11 and 12 are clamped against the housing 10 with clamp bolts 13 which extend across the exterior of the housing 10 through the two plates 11 and 12.

The front and back plates are provided with base shoes 14 by means of which the entire device can be attached to any suitable foundation such as indicated at 15. Each of the plates 11 and 12 supports a bearing box 16 in which a drive shaft 17 rotates. The shaft may be driven from a pulley 21 or in any other desired manner.

The upper portion of the housing 10 is provided with a screen opening 22, the opening being covered by an arcuate screen 23 which completes the periphery of the housing 10. The screen 23 rests upon the housing 10 at the extremities of the opening 22 and is held in place therein by means of bolts 24 which pass across the screen 23 between the plates 11 and 12, as shown in Fig. 3. Access may be had to the screen through a removable door 25. The door 25 opens to a discharge compartment 26 formed between the plates 11 and 12 above the housing 10.

The grinding is accomplished by means of a series of radial arms 37, hinged to a rotor disk 18 upon pivot bolts 20, and provided with paddles 19. The rotor disk 18 is keyed to the shaft 17 within the housing 10. Material is fed into the housing 10 through a feed opening 27 in the front plate 11. The feed opening 27 opens to the housing immediately below the bearing box 16 and receives

material from an inclined feed hopper 28. The discharge compartment 26 is open to a vertical stack 29 which discharges into a ground feed receiver 30. The receiver 30 is supported from the plates 11 and 12 upon a suitable bracket 35.

The ground feed can be discharged from the receiver 30 through either one of two discharge spouts 31 by actuating a damper 32.

A cylindrical dust baffle 33 extends downwardly through the top of the receiver 30. The baffle 33 is open at both its top and bottom and is covered by means of a cap 34.

Operation

In use, the material to be ground is placed in the feed hopper 28 and the shaft 17 is rapidly rotated in the direction of the arrow in Fig. 3. This causes the device to act as a centrifugal fan or blower intaking through the feed opening 27 and discharging through the stack 29. The suction of the inrushing air draws the material from the feed hopper 28 through the opening 27 where it is subjected to a violent beating action by the paddles 19.

The centrifugal force of revolution will force the material against the grinding surface 36 of the housing 10 and rapidly grind and pulverize it. When the material has been ground sufficiently fine to pass through the meshes of the screen 23 it will immediately leave the housing 10, driven by the violent blast of air therefrom, and enter the discharge compartment 26. From here it will be blown upwardly in the stack 29 and deposited in the receiver 30. In the receiver 30 the air will swirl downwardly about the baffle 33 and deposit its solid material, thence it will flow upwardly through the baffle 33 and discharge under the edges of the hood 34 free from dust.

The mesh of the screen 23 accurately determines the fineness of the grind for the material will immediately leave the housing 10 when it has reached sufficient fineness to pass through the screen. Therefore, none of the material is subjected to unnecessary grinding. The screen is easily removable through the door 25 by removing the bolts 24 so that the device can be quickly adapted to grind differing materials to differing degrees of fineness.

It is desired to call attention to the advantages gained by hinging the paddle arms 37 upon the pivot bolts 20. First, the shock of starting the machine is absorbed in the hinges since the arms are not required to immediately follow the rotation of the sleeve 18; second, a safety device is provided for should any bolts, rocks, or other uncompressible and ungrindable material enter the housing 10, the blades will swing backwardly as indicated by the broken line position in Fig. 3, so as to pass over this material without damage to the machine until the operator can shut off the power and remove the obstruction; third, should the machine be overloaded by an unusually rapid feed the arms can swing backwardly until the amount of material has been reduced or until the inertia of the load has been overcome without damage to the machine.

It is also desired to call attention to the efficient construction of the paddle arms 37 and the paddles 19. It will be noted that the paddles 19 are relatively wide so as to occupy substantially the full width of the housing 10. Thus, they act to clear all material from the housing and prevent packing of material into the corners thereof. The paddles are also relatively narrow in a radial direction. This reduces head resistance, places the full width of the blade at the periphery only where all of the work is done and allows a free, unobstructed passage for the entrance of the feed material through the feed opening 37. The arms 37 are formed integrally with the paddles 19, strengthening ribs being provided on the rear faces of the paddles as illustrated. The arms 37 are bifurcated and pass upon each side of the disk 18 so that the paddles 19 are rigidly maintained parallel to the shaft 17.

Should it be desired to elevate the ground feed to a silo, barn, or other storage, the stack 29 may be disconnected from the receiver 30 and run to the desired point. The blast from the rotating paddles has been found amply sufficient to elevate fodder to a height of seventy-five feet.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied within the scope of the appended claim, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

A feed grinder comprising: a cylindrical housing; side plates closing the sides of said housing; clamp bolts clamping said side plates against said housing; a shaft mounted in said side plates; paddles carried by said shaft and arranged to rotate within said housing; said housing being provided with a feed opening adjacent its lower part and with a discharge opening in its upper periphery; an arcuate screen closing said discharge opening and completing the periphery of said housing; and a discharge compartment formed above said screen and a door opening to said compartment so as to allow removal of said screen.

In testimony whereof, I affix my signature.

RAYMOND B. ELDERKIN.