Nov. 12, 1929. C. A. HUFFMAN 1,735,823

YIELDING ANVIL KNIFE TABLE FOR MASTICATING HOGS

Filed May 14, 1928 2 Sheets-Sheet 1

Fig. 1.

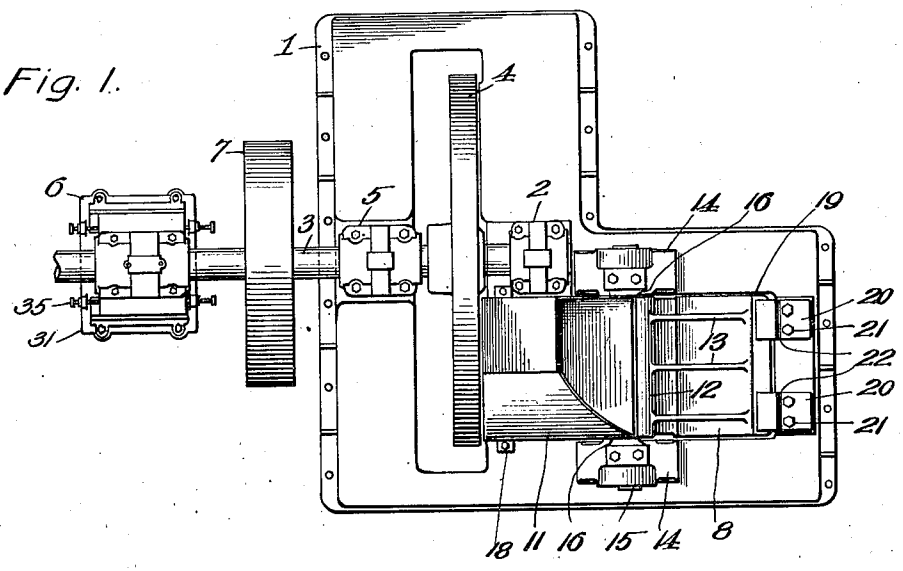


Fig. 2.

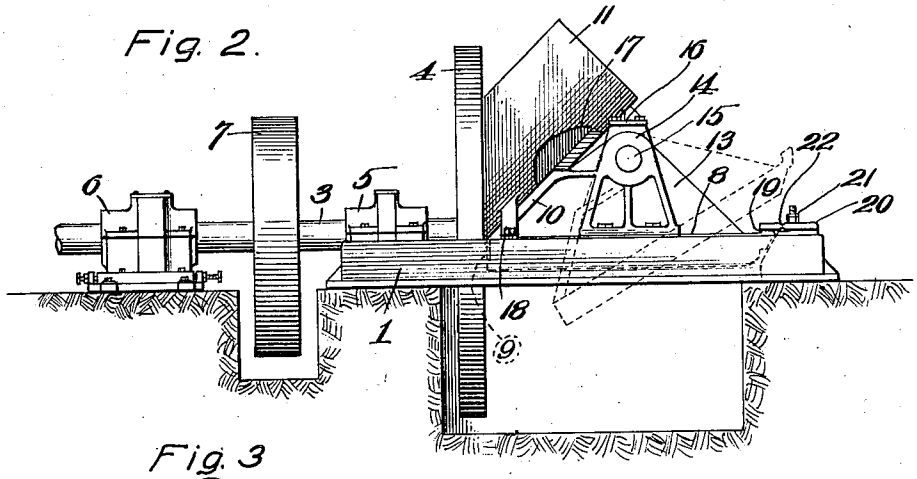
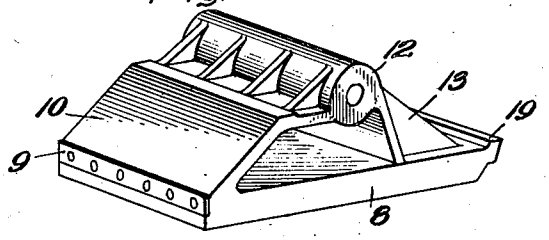


Fig. 3



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Fig. 4.

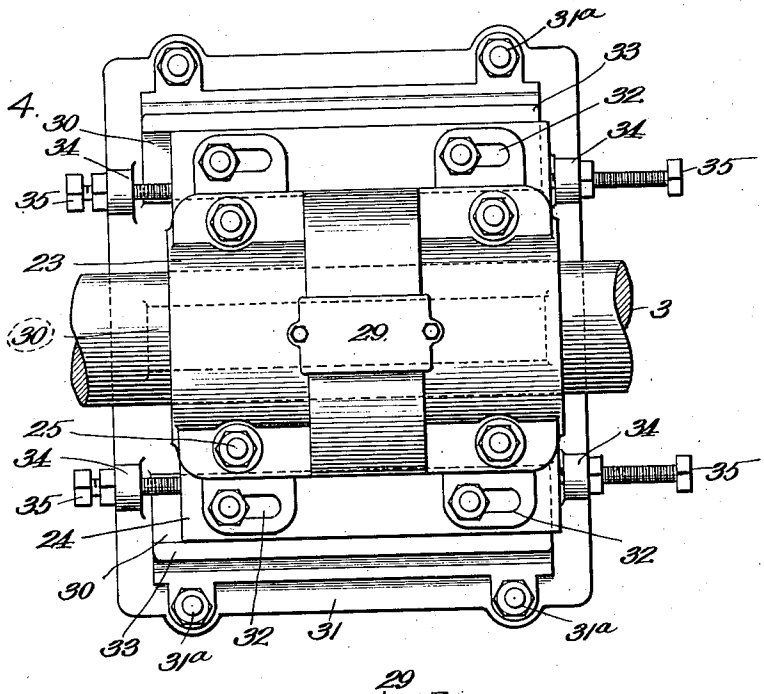
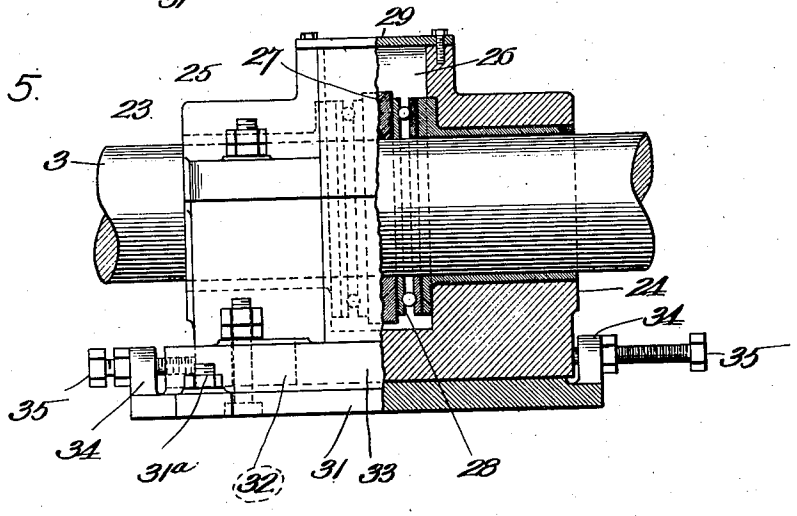


Fig. 5.



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UNITED STATES PATENT OFFICE

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YIELDING ANVIL-KNIFE TABLE FOR MASTICATING HOGS

Application filed May 14, 1928. Serial No. 277,469.

This invention relates to grinding or masticating hogs designed for grinding wood, cork, rubber and the like, of that class involving a fixed knife and a revolving disk or wheel carrying a plurality of knives cooperating successively with the fixed knife. As it frequently occurs that metal or relatively hard objects become accidentally mixed with the material to be ground and lead to the injury of the machine or grinding knives, means has heretofore been provided whereby the rotating knife could move away from the fixed knife and increase the space to permit such foreign materials to pass between the cutters without injury to the mechanism.

The object of this invention, however, is to provide a simplified construction whereby the fixed knife may move away from the rotating knives a predetermined maximum distance, for example, far enough to permit a metallic or other hard object of say 12″ x 12″ x 30″ to pass by without injury to any part of the machine, the complications in bearings for the rotating knife are entirely obviated.

Another object of the invention is to provide a machine which may be readily adjusted to grind coarse or fine particles by the provision of an adjustable double thrust-bearing for the rotating knife.

A further object of the invention is to produce a construction in which the fixed knife is so mounted that it will require a predetermined force or pressure on the knife before it will recede to permit the hard material to pass, it thus being possible to absolutely fix the maximum strain to which the parts of the machine may be subjected.

A still further object of the invention is to produce a strong, durable, efficient and inexpensive construction of the type outlined; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:

Figure 1 is a top plan view of a masticating hog embodying the invention.

Figure 2 is a side elevation of the hog as shown in Figure 1, parts being broken away to more clearly disclose the construction.

Figure 3 is a perspective view of the anvil knife table.

Figure 4 is an enlarged top plan view of the adjustable double thrust-bearing forming a part of the invention.

Figure 5 is a side elevation of the bearing shown in Figure 4, substantially one-half thereof being in central vertical section.

In the said drawings, where like reference characters identify corresponding parts in all of the Figures, 1 indicates a substantially L-shaped base, on which is mounted an end bearing 2 for a shaft 3 carrying a rotating wheel 4 equipped with a plurality of cutting knives (not shown) on one of its faces. The shaft 3 is provided with a bearing 5 on the side of the wheel opposite from the end bearing 2, and at any convenient point in its length is equipped with an adjustable double thrust-bearing 6. The shaft carries a pulley 7 for engagement with a belt, or it may be driven by any other suitable means.

The frame 1, at one side of the longitudinal center of the cutting wheel, is formed with a rectangular opening normally closed by anvil knife table 8. The anvil knife table carries a fixed knife blade 9 at its front edge for cooperation with the cutting wheel, it of course being understood that the direction of rotation of the wheel is such as to shear downwardly toward the knife 9. The table 8 is formed integrally with a downwardly inclined web 10 forming a part of the bottom of a feed chute 11 to provide a yieldingly closed release opening as will hereinafter appear The web 10 also merging into a bearing 12 for the table, the rear portion of the table being connected to the bearing by webs 13 (see Figure 3).

Mounted upon the frame 1 at opposite sides of the anvil knife table are a pair of upright brackets 14 carrying a shaft 15 on which the table is oscillatably mounted. It will be noted that the center of gravity of said table is preferably nearer its knife bearing edge so that when unrestrained, the table will stand in the dotted line position shown in Figure 2, although this feature is not necessary to a proper operation of the table, as will hereinafter appear.

Mounted upon the upper ends of brackets 14 are plates 16 forming a support for the chute 11. The bottom 17 of said chute is flush with the web 10 of the anvil knife table and the lower sides of the chute are formed or provided with brackets 18 screwed to frame 1.

The rear end of the table is formed with an upwardly projecting flange 19 in abutment with a pair of overlying breakable straps or lugs 20 mounted on base 1 by clamp bolts 21. The straps or lugs 20 may be of such cross sectional area as to stand a predetermined strain, or may be transversely grooved as at 22 to provide a breaking line, as shown in Figure 2.

With a construction as above described, it will be evident that the cross sectional area of the straps or lugs 20 to withstand a predetermined load may be readily calculated, and that should a metallic or relatively hard object come between the fixed and rotating knives, and impose a downward strain on the front edge of the table greater than the breakable straps or lugs 20, will stand, that said lugs will break and the table will immediately oscillate to the dotted line position shown in Figure 2. It will be apparent that upon such movement of the table all strain between the knives is immediately released and the material in the chute will pass below the anvil knife table through the opening formed by the recession of web 10 on the table until the rotation of the rotating cutter has ceased.

In order to hold the rotating knife in any predetermined position of adjustment to cut fine or coarse particles, an adjustable double thrust bearing comprising upper and lower halves 23 and 24 respectively, is provided. The upper half 23 is held to the lower half by bolts 25. Each half of the bearing is recessed as at 26 to provide an operating space for a thrust collar 27 rigidly carried by the shaft 3. Mounted within the bearing for cooperation with the opposite faces of the collar 27 are a pair of roller bearings 28 (one only appearing), it being thus apparent that upon movement of the bearing it will effect endwise adjustment of the shaft in either direction. For convenience in lubricating the bearing, its upper half is provided with a removable cover plate 29.

The lower bearing member 24 is slidably mounted on three ribs 30 upstanding from a base plate 31 secured to a suitable foundation or support by bolts 31a, said lower bearing member being held against upward movement by a series of bolts 32 passing through slots 33 carried by base plate 31 and in the member 24. Formed integrally with the base and upstanding therefrom are a pair of guide ribs 33 between which the bearing member 24 slides as will be readily understood. In order to adjust the bearing and consequently the rotating cutter for a fine or coarse cut, a pair of ears 34 project from opposite edges of the base plate 30, and in threaded engagement with said ears are locking and adjusting bolts 35 which thrust against lower bearing member 24 to slide same in the desired direction.

From the above description it will be apparent that I have produced a masticating hog embodying the features of advantage set forth as desirable in the statement of the objects of the invention, and which is susceptible of modification in minor particulars without departing from the principle and scope of the appended claims.

I claim:

1. In a masticating or grinding hog, a rotating disk cutter, another cutter for cooperating with the face of the rotating disk cutter, and means for holding the last-named cutter against movement away from the rotating cutter under normal conditions of operation, but adapted to permit such cutter to move out of cooperative relation with the rotating cutter.

2. In a masticating or grinding hog, a rotating disk cutter, another cutter for cooperating with the face of the rotating disk cutter, and breakable means for holding the last-named cutter against movement away from the rotating cutter under normal conditions of operation, but adapted to permit such cutter to move out of cooperative relation with the rotating cutter.

3. In a masticating or grinding hog, a rotating disk cutter, a fixed cutter for cooperating with the face of the rotating disk cutter, an oscillatable means carrying the fixed cutter, and means for preventing the oscillatory means from withdrawing the fixed cutter from cooperation with the rotating cutter under normal conditions.

4. In a masticating or grinding hog, a rotating disk cutter, a pivotally suspended table, a fixed cutter carried by the table for cooperation with the face of the disk cutter, and breakable means engaging the table for holding the fixed cutter in cooperative relation to the rotating cutter.

5. In a masticating or grinding hog, a rotating disk cutter, another cutter for cooperating with the face of the rotating cutter, a pivotally-suspended table carrying the fixed cutter at one side of the pivotal point and of preponderating weight at the same side, and breakable means engaging the table for normally preventing action thereof tending to withdraw the fixed cutter from cooperative relation with the rotating cutter.

6. In a masticating or grinding hog, a rotating cutter and a cooperating cutter, a feed chute for supplying material to the cutters and being formed with a bottom opening, a table carrying the cooperating cutter, and means holding the table in position as a closure for said bottom opening of the chute and

the cooperating cutter adjacent the rotating cutter.

7. In a masticating or grinding hog, a suitable frame, a rotating cutter therein, a chute for feeding material to the cutter and being formed with a bottom opening, a table underlying the cutter and closing said bottom opening, and a fixed cutter carried by the table for cooperative relation with the rotating cutter below the feed chute; said table being capable when an unyielding object comes between the cutters, of yielding to withdraw the fixed cutter from operative position and permit material in the feed chute to freely pass between the cutters.

8. In a masticating or grinding hog, a suitable frame, a rotating cutter therein, a chute for feeding material to the cutter, a movable table underlying the chute and forming a portion of the discharge end of the bottom thereof, a fixed cutter carried by the table for cooperative relation with the rotating cutter below the feed chute, and breakable means for holding the table in operative relation to the feed chute and the fixed cutter in operative relation to the rotating cutter.

9. In a masticating or grinding hog, a pair of cooperating cutters capable of separating movement, a feed chute therefor having a bottom opening and a table having a portion normally closing said bottom opening, and means actuated by engagement of an unyielding object fed to the cutters by the chute, of effecting the withdrawal of said bottom closing portion to permit material to escape from the chute without being operated on by the cutters.

10. In a masticating or grinding hog, a rotating cutter and a cooperating fixed cutter, a feed chute for supplying material to the cutters and having a release opening, a table normally closing the release opening and carrying the fixed cutter in proximity to the rotating cutter and yielding means adapted at times to permit the table to uncover the release opening and withdraw the fixed knife from cooperative relation with the rotating knife.

11. In a masticating or grinding hog, a rotating cutter and a cooperating fixed cutter, a feed chute for supplying material to the cutters and having a release opening, a table normally closing the release opening and carrying the fixed cutter in proximity to the rotating cutter, and breakable means adapted at times to break and permit the table to uncover the release opening and to withdraw the fixed knife from cooperative relation with the rotating knife.

12. In a masticating or grinding hog, a rotating cutter, a second cutter for cooperation with said rotating cutter and pivotally mounted in a plane above its line of cooperation with the rotating cutter, for movement out of cooperative relation with the rotating cutter and means for normally maintaining the fixed cutter in position for cooperation with the rotating cutter.

13. In a masticating or grinding hog, a rotating cutter, a second cutter for cooperation with said rotating cutter and pivotally mounted in a plane above its line of cooperation with the rotating cutter, for movement out of cooperative relation with the rotating cutter and yielding means for normally maintaining the fixed cutter in position for cooperation with the rotating cutter.

14. In a masticating or grinding hog, a rotating cutter, a second cutter for cooperation with said rotating cutter and pivotally mounted in a plane above its line of cooperation with the rotating cutter, for movement out of cooperative relation with the rotating cutter and breakable means for normally maintaining the fixed cutter in position for cooperation with the rotating cutter.

In testimony whereof I affix my signature.

CHARLES A. HUFFMAN.