Jan. 31, 1961 W. S. GRUENDLER 2,969,820

SHREDDING HAMMERS

Filed Sept. 8, 1958

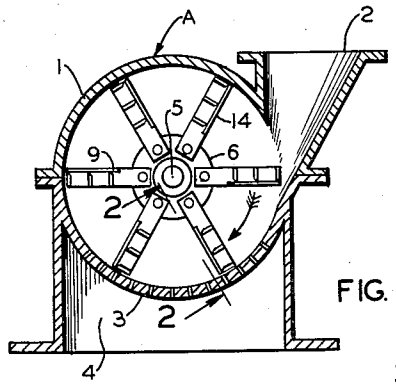


FIG. 1

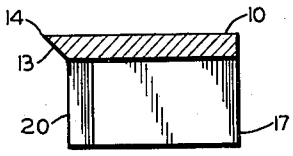


FIG. 4

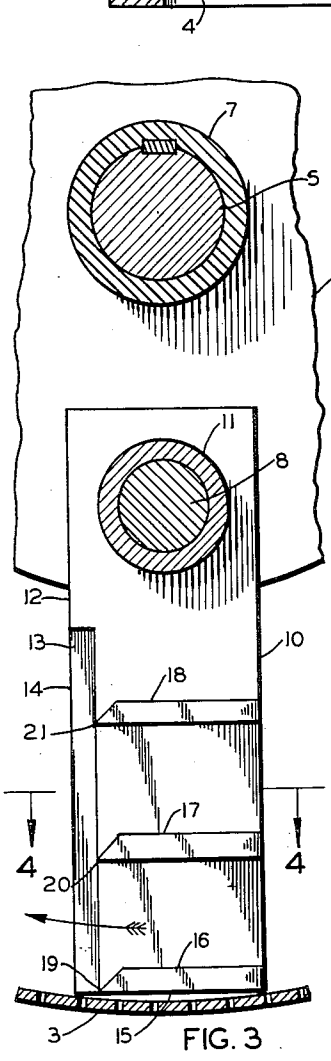


FIG. 3

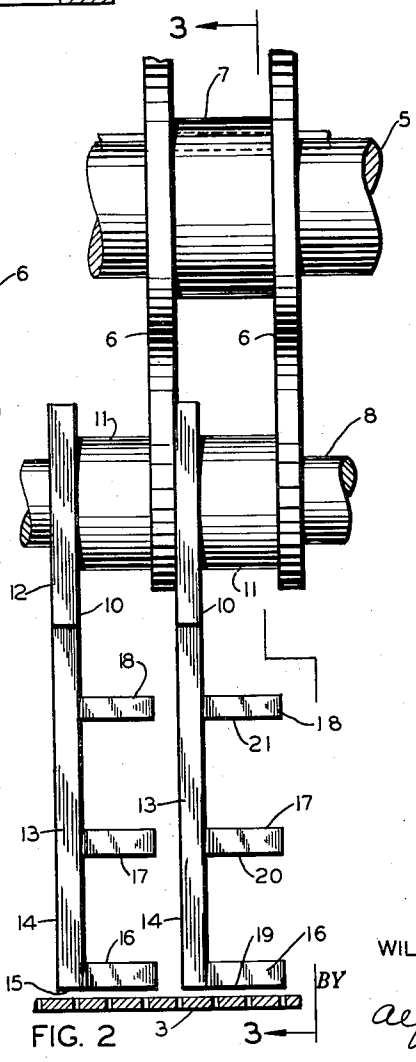


FIG. 2

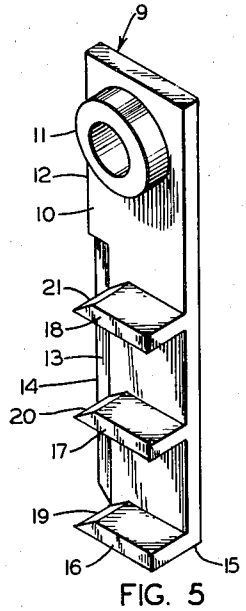


FIG. 5

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2,969,820

Patented Jan. 31, 1961

2,969,820

SHREDDING HAMMERS

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Filed Sept. 8, 1958, Ser. No. 759,662

2 Claims. (Cl. 146—123)

This invention relates to certain new and useful improvements in swing hammers for use in shredders of the hammer mill type.

It is a primary object of the present invention to provide a swing hammer for use in shredders of the hammer mill type, which hammer provides combined shredding and impact disintegration which is particularly efficient in comminuting fibrous materials, such as hay, alfalfa, jutes, and the like.

It is also an object of the present invention to provide a swing hammer of the type stated which will operate without clogging.

It is a further object of the present invention to provide a swing hammer of the type stated having a plurality of cutting edges which are relatively positioned in such a manner that the hammer efficiently and completely shreds the fibers of the material charged into the shredder at improved throughput rates and lowered power consumption.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing (one sheet):

Fig. 1 is a vertical sectional view of a shredder provided with swing hammers constructed in accordance with and embodying the present invention;

Fig. 2 is an enlarged fragmentary sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view taken along line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional view taken along line 4—4 of Fig. 3; and

Fig. 5 is a perspective view of the swing hammer of the present invention.

Referring now in more detail and by reference characters to the drawing which illustrates a practical embodiment of the present invention, A designates a shredder of the so-called hammer mill type comprising a casing 1 provided with an upwardly presented intake hopper 2 and an arcuate perforated screen 3 which is disposed across a downwardly presented discharged opening 4. Rotatably mounted within the casing 1 is a main shaft 5 having a plurality of spaced parallel discs 6 keyed or otherwise rigidly mounted thereon and spaced apart by means of collars 7. The main shaft 5 may be driven in a conventional manner by a suitable prime mover (not shown). Mounted in the discs 6 radially outwardly of the main shaft 5 and in spaced parallel relation thereto is a plurality of rods 8 for pivotally supporting a plurality of spaced swing hammers 9, each including a flat, generally rectangular shank 10 which extends radially outwardly of its associated rod 8 and terminates in close proximity to the perforated screen 3. Integrally formed on the shank 10 and projecting laterally outwardly therefrom is a journal-forming spacer collar 11 which encircles the rod 8 whereby the combined widths of the collar 11 and shank 10 is approximately equal to the distance between the discs 6.

The forward or leading edge 12 of the shank 10 is beveled at 13 in the provision of a cutting edge 14 which extends from the outer edge 15 radially inwardly along a major portion of the length of the shank 10. Integrally formed on one face of the shank 10 and projecting laterally outwardly at right angles therefrom is a plurality of equally spaced plate-like parallel cutters 16, 17, 18, each of which is beveled along its forward margin to provide lateral cutting edges 19, 20, 21, the latter being rearward of the cutting edge 14 (the arrow in Fig. 3 indicates a forward direction). The cutting edge 19 is, furthermore, located in alignment with the outer periphery of the shank 10. Consequently, the cutting planes of the lateral cutting edges 19, 20, 21, will be disposed at right angles to the cutting plane of the edge 14.

In use, the main shaft 5 is rotated by the power source (not shown) whereupon material may be charged into the intake hopper 2 so as to be subjected to the action of the hammers 9 until the material is sufficiently reduced in size to pass through the perforated screen 3. As the material is charged into the intake hopper 2 the fibers thereof will be oriented at random, but since the cutting edge 14 is located in the plane of rotation while the cutting edges 19, 20, 21, are in planes at right angles thereto, the hammers 9 will provide cutting edges which will at all times be disposed transversely of the fibers of the material irrespective of their orientation within the casing 1. As a result, the frequency in which each fiber is struck by a cutting edge is significantly increased and, therefore, the time required for reducing the fibers to the desired size is shortened. Moreover, the shank 10 and lateral cutters 16, 17, 18, are relatively thin, and therefore, the fibers are cut with a minimum amount of power.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the shredding hammers may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

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

1. A cutter for a hammer mill type of comminuter comprising an elongated substantially rectangular shank having a collar type journal adjacent one of its ends, one of the longitudinal edges of said shank having a bevel, on one side only, forming a cutting edge, a plurality of substantially rectangular plate-like and substantially parallel cutters extending outwardly from one side of said shank, one of said cutters being located at the end of said shank opposite to said journal, and each of said cutters having a bevel, on one side only, forming a cutting edge facing in the same direction as the cutting edge of said shank and slightly inwardly with respect thereto.

2. A cutter of the type described in claim 1 wherein the cutting edges of the plate-like cutters lie in a common plane and said plane is perpendicular to the plane of the cutting edge of the shank.

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