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P. S. MITTS

CYLINDER DRUM MECHANISM FOR CUTTING MACHINES

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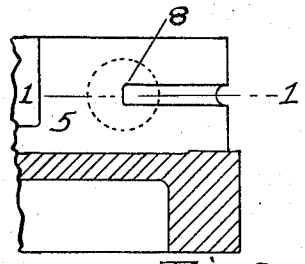


Fig. 3

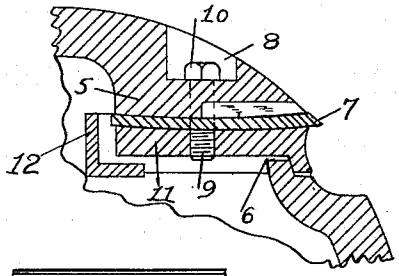


Fig. 5

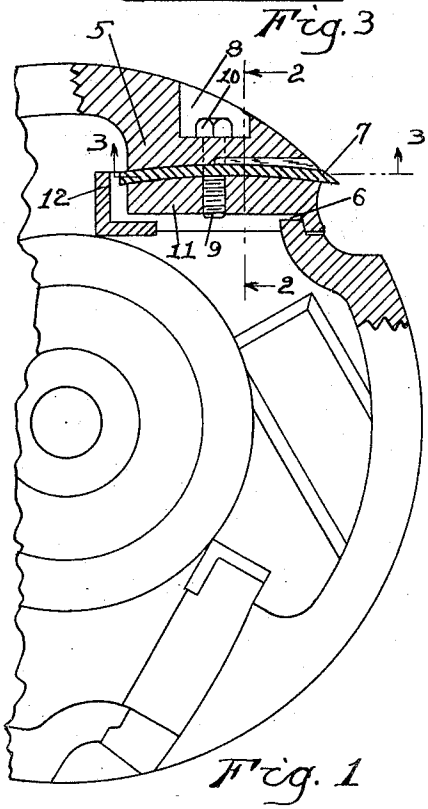


Fig. 1

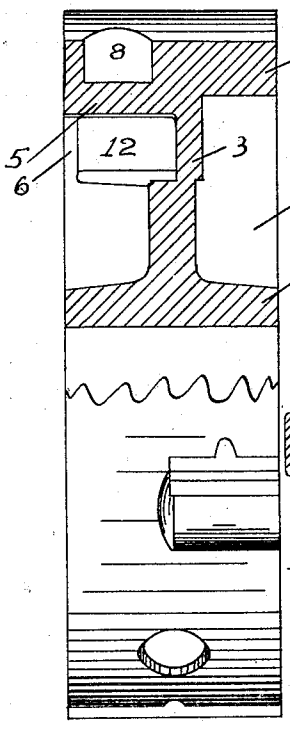


Fig 2

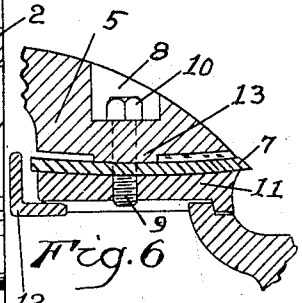


Fig. 6

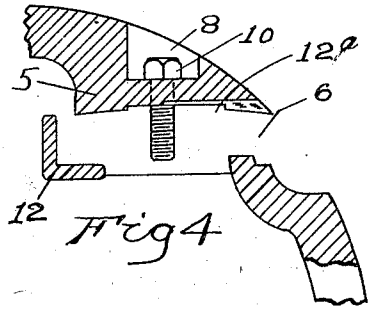


Fig 4

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BY

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UNITED STATES PATENT OFFICE.

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CYLINDER-DRUM MECHANISM FOR CUTTING MACHINES.

Application filed March 19, 1923. Serial No. 626,143.

To all whom it may concern:

Be it known that I, PHILIP S. MITTS, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Cylinder-Drum Mechanism for Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to cutting shredders and similar machines and pertains more particularly to an improved drum construction for that class of cutting shredders known in the trade as "sawmill hogs" and employing a cylindrical drum having cutting knives on its surface.

This type of machine is adapted for grinding sawmill refuse and also for disintegrating other materials, for example, waste sheets of veneer and other wood refuse, such as the cores of veneer logs.

Grinding or disintegrating sheet veneer and such materials requires high speed drums of considerable length. The length for some purposes is as much as four feet, being approximately the width of some of the material fed to the machine.

The greatly increased length of drum required by sheet veneer and other wide materials has developed new problems in drum construction and the means formerly employed for securing the knives to the shorter drums is no longer adequate when employed on long drums, as will be explained.

Insomuch as this veneer shredding machine requiring a long drum is also adapted for shredding sawmill refuse, veneer log cores and the like and since these materials are very hard to cut, it has become necessary to anchor the cutting knives so firmly to the elongated drums above referred to as to make it impossible for the knives to shift their position on the drum under the impact of any below to which they may be subjected in ordinary use.

My improvement includes building up a long drum from a plurality of independent short drum sections so that from a number of such unit sections drums of any required length may be constructed. I provide each of these unit sections with a plurality of knives so mounted that the knives will be sprung or bent to curved form and will be clamped in that form against a shaped seat. The clamping of the knife is preferably accomplished by means of a bolt tightened from outside the drum. The springing or bowing of the knife when so clamped effectually prevents the knife slipping when subjected to unusually hard service. In my present application I shall describe and claim means for applying the knife-clamping device to an improved construction, namely, a drum comprising unit sections of narrow width, adapted to be built up into a drum of any desired length, the sections so constructed that the knives can be sprung and clamped from outside the periphery of the assembled drum.

The advantages of such construction both from an operating and production standpoint are apparent when it is observed that a set of, say, six knives is usually employed on each drum section, equally spaced around its periphery. The section, therefore, must be extremely strong and rigid to withstand the strains brought upon it by the six knives when in action on hard and large materials. I, therefore, provide each section with a radial web or with spokes. Such webs or spokes necessarily prevent access to the interior of a drum built up of several sections. If it were attempted to make a similar multi-webbed drum in a single casting, the presence of the webs would make it impracticable to properly machine the necessary curved faces of the knife seats on the drum; but by employing a plurality of identical and interchangeable short unit drum sections, their curved knife-seats may be easily and accurately machined or otherwise shaped to properly spring and bow the knife and to permit the knife to be tightened from outside the drum as previously mentioned.

With the foregoing and certain other objects in view which will appear later in the specification, my invention comprises the devices described and claimed and the equivalents thereof.

In the drawings, Fig. 1 is a part sectional side view, broken away, showing a unit section of a shredding machine drum embodying one form of my improvement and including a concave knife seat.

Fig. 2 is a part sectional edge view of the same with the knife and its clamping devices removed.

Fig. 3 is a horizontal section on line 3—3 of Fig. 1, viewed in the direction of the arrows.

Fig. 4 is a fragmetnary sectional view of a modified form of knife seat of the kind illustrated in Fig. 1, the knife removed.

Fig. 5 is a part sectional detail showing a convex knife seat.

Fig. 6 is a similar view of a modified form of knife seat such as is illustrated in Fig. 5.

As is clearly shown in the drawings, the invention consists in providing a unit drum section 1 having the usual hub 2, web 3 and rim 4. The rim is formed with a plurality of internal projections or lugs 5 with adjacent knife-receiving openings or pockets 6 through which the cutting knives are inserted as shown in Figs. 4 and 5. The knife when in place is clamped against the inner face of the lug 5, being the lower face as shown in Figs. 1, 5 and 6. In the periphery of the drum opposite the clamping face of the lug 5 is formed a bolt-receiving pocket 8 into which a clamping bolt 9 is inserted. The head 10 of bolt 9, or, if desired the nut instead of the head of the bolt, is rotatable, pocket 8 being large enough to receive a socket wrench or other tool for the purpose.

Beneath the knife 7 is a clamping plate 11 or its equivalent preferably threaded to the bolt 9 and adapted to clamp knife 7 rigidly against the clamping face of lug 5 when bolt 9 is tightened.

As already explained, the knife is held against shifting when subjected to unusual impacts, not only by being clamped to the face of lug 5, but also by being forcibly bowed or sprung in the act of clamping.

The knife may be sprung to concave form on its upper face, as shown in Fig. 1, or it may be sprung to convex form on its upper face as shown in Figs. 5 and 6 and this springing or bowing of the knife may be accomplished either by drawing the clamping plate 11, or its equivalent, upward by bolt 9 so that the knife is forced against the concave face of lug 5 as shown in Fig. 1, or it may be similarly clamped by bowing the knife against a face formed as in Fig. 4, where the lower face of the lug is cored or recessed as at 12^a. Similarly the knife may be bowed into downwardly concave form as shown in Fig. 5 by being clamped against the downwardly convex face of lug 5, or it may be bowed by providing the plate 11 with a concave upper surface, as shown in Fig. 6 and clamping the knife against the lower face of lug 5, which in that case may be formed with a central projection 13.

In all of these forms, however, it will be noted that each unit section 1 has its knives 7 so mounted that those knives are sprung and clamped in place against the lower face of lug 5 by means of bolt 9, which is tightened from outside the cylinder, so it is not necessary to reach into the cylinder to tighten the clamping bolt as heretofore.

In long cylinders, that is, cylinders made up of several unit sections 1, it is not possible to reach the clamping bolts of the sections toward the middle of the length of such cylinder on account of the webs 3. The present improvement provides both for inserting the knife into each unit section from outside after the drum is assembled and for tightening the bolt 9 by means of its head or nut 10 from a position outside the cylinder.

Furthermore in each instance the knife is not only clamped, but curved or bowed either convex or concave upwardly, thereby insuring extremly rigid clamping.

To prevent the knife slipping back and dropping into the cylinder when the knife is unclamped I prefer to form a projection 12 on the drum and in the rear of the knife, as shown in Fig. 1.

By the means above described I have produced a unit section for shredding machines that adapts itself readily to building up of long cylinders in which the knives are readily insertible and rigidly clamped from outside by being curved or bent in the act of clamping.

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

1. A short cylindrical section for built-up multiple section cutting drums of the class described, said section formed with a knife-receiving opening in its periphery, a lug integral with said section, a face of said lug formed to provide a slightly curved knife-receiving seat, extending from the periphery of the drum inwardly, and means adapted to forcibly spring said knife into contact with said seat.

2. A short cylindrical section for built-up multiple section cutting drums of the class described, having a central web and a rim, said section formed with a knife-receiving opening in its periphery, a lug integral with said rim, a face of said lug formed to provide a slightly curved knife-receiving seat extending from the periphery of the drum inwardly, a recess in said rim, a bolt in said recess extending through said curved seat, and a knife-clamping plate secured to said bolt and adapted to forcibly spring said knife into contact with said seat.

3. In combination, a short cylindrical section for built-up cutting drums, a knife-clamping device comprising a knife-receiving pocket in the periphery of said section, a wall of said pocket curved, a clamping plate having a curved face, a shredding knife received between the curved wall of said pocket and the curved face of said clamping plate, a bolt socket formed in the exterior periphery of said drum, a bolt in said socket,

an end of said bolt engaging said clamping plate, said bolt adapted when tightened from within said socket to bend and clamp said knife, and a projection on said drum in the rear of said knife, for the purposes set forth.

4. A short cylindrical section for built-up cutting drums, said section formed with a knife-receiving opening arranged across the periphery of each section, a lug integral with said section, a face of said lug formed to provide a slightly curved knife-receiving seat extending inwardly from the periphery of the drum, said seat shaped and adapted to cause said knife to bow or spring when forcibly clamped against said face, and means for clamping said knife.

In testimony whereof, I affix my signature.

PHILIP S. MITTS.