Aug. 18, 1964 P. J. FONTAINE 3,144,995

WOOD CHIPPER

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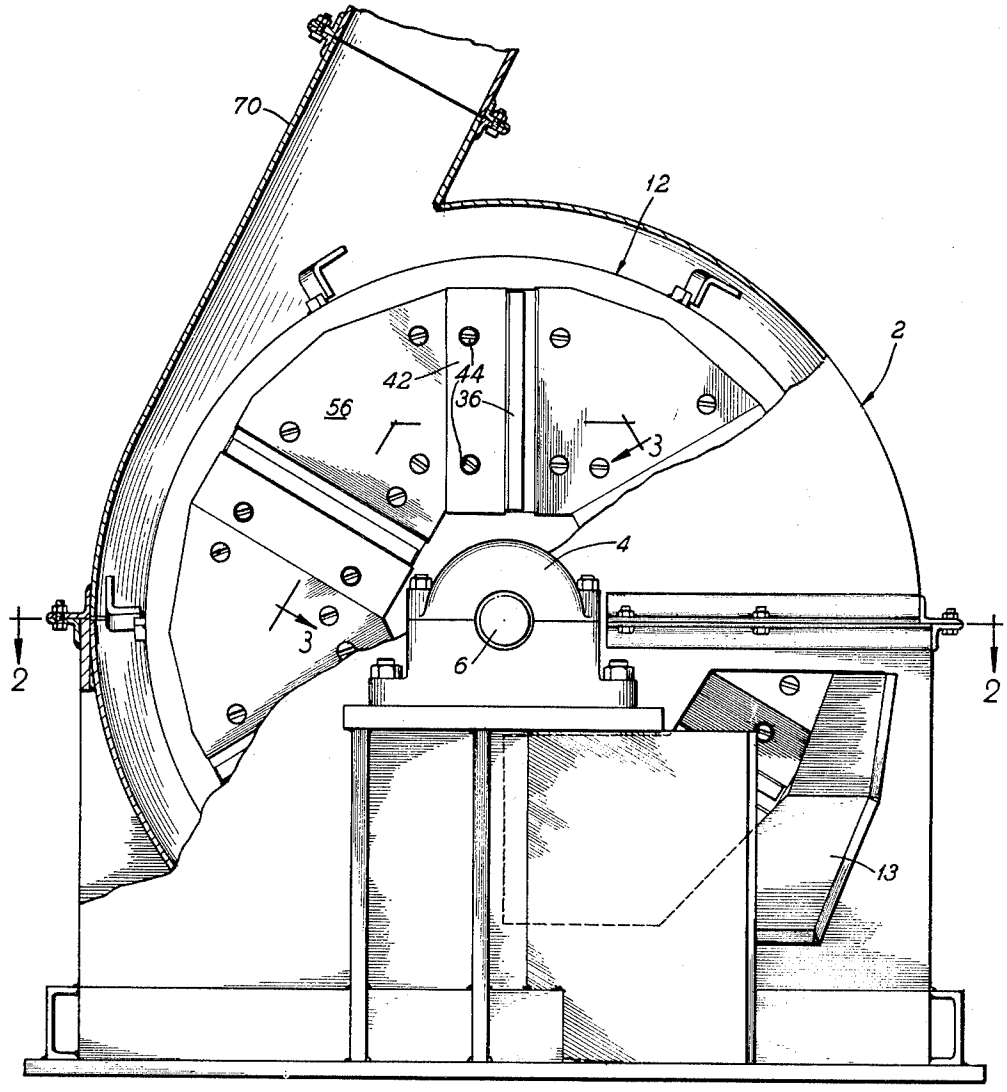


Fig. 1

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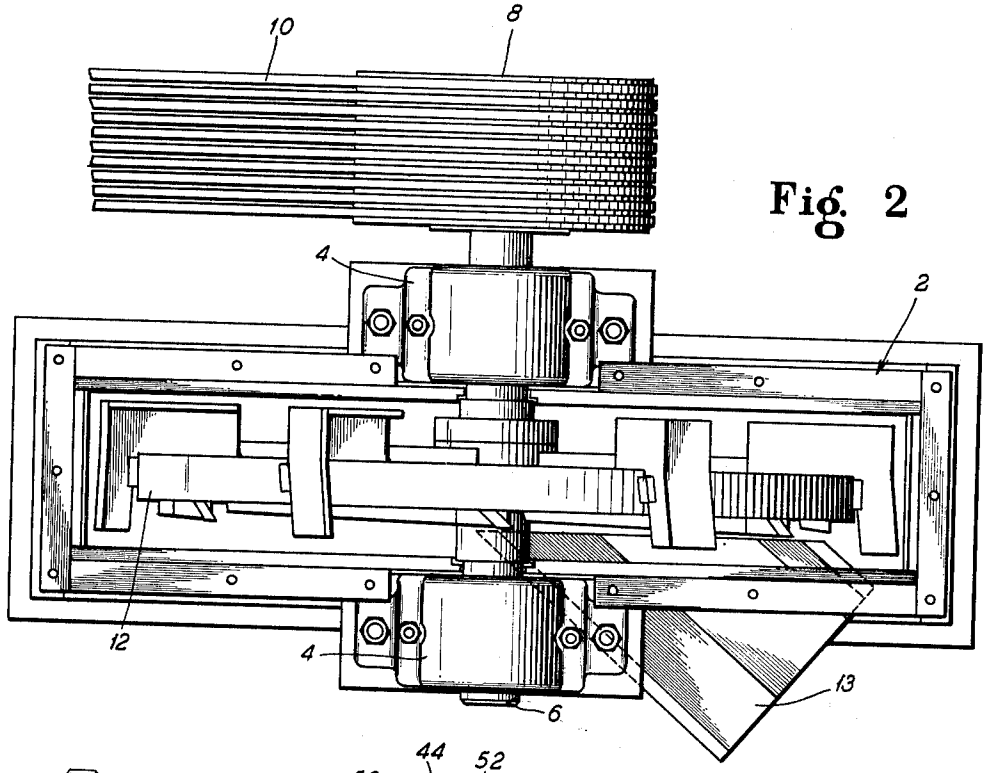


Fig. 2

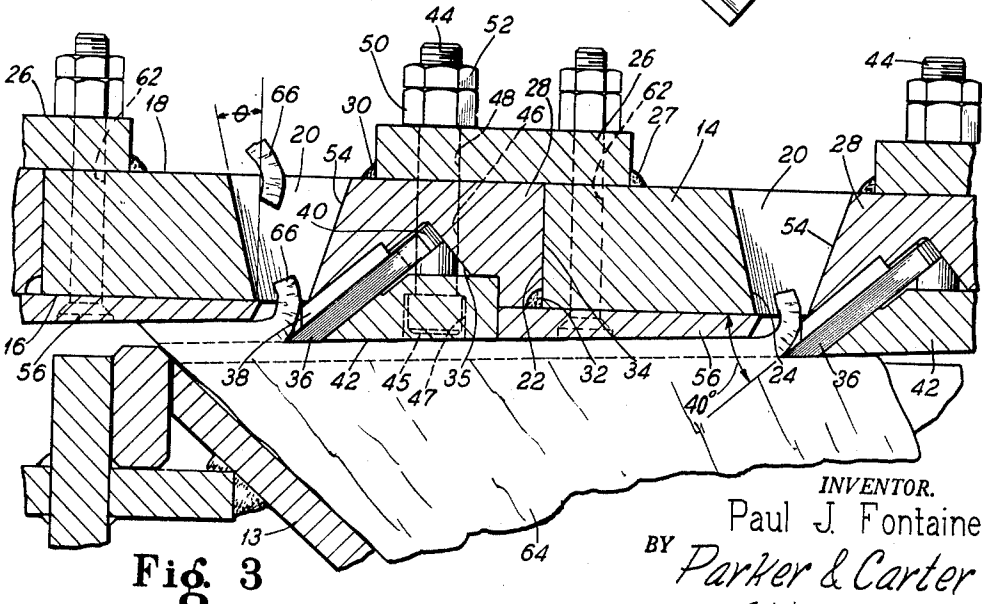


Fig. 3

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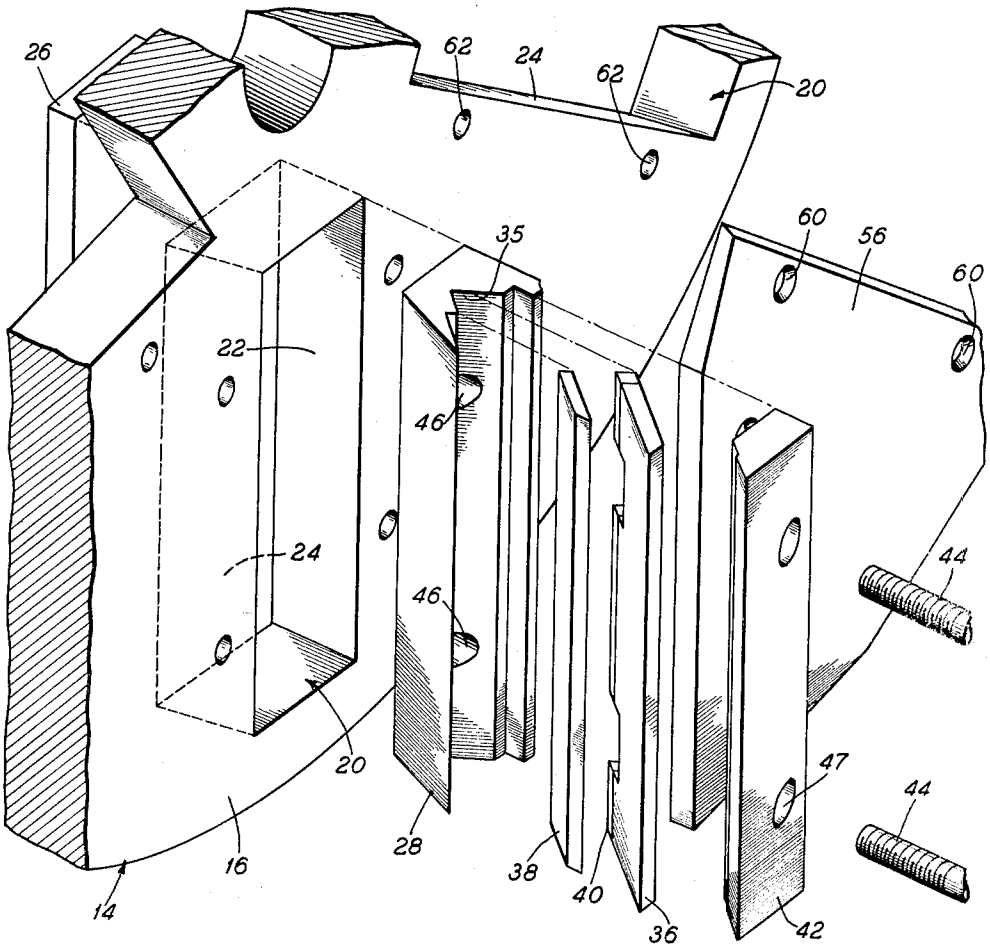


Fig. 4

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WOOD CHIPPER

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This invention relates in general to improvements in mechanism for cutting waste wood into usable size chips for pulp production and it relates more especially to various improvements in the construction of mechanism of this particular type having a series of revolving chipping knives carried by a rotating disc, cooperating with the wood delivered into engagement with the rotating disc to produce chips or pieces.

As shown in the Payzer Patent No. 1,906,486, issued May 2, 1933, and in the Durkee Patent No. 2,712,904, issued July 12, 1955, it is old in the art to reduce waste wood into chips with the aid of a rotary disc having an annular series of knives mounted thereon in cavities or recesses as shown in the Payzer patent or on knife mounting means secured to the surface of the disc as shown in the Durkee patent. While both of these knife mounting means have been found generally satisfactory in operation, each has innate characteristics which present problems in either manufacture, both economical and practical, or problems in operation due to the nature of the construction. In the type of chipping unit shown in the Payzer patent, operation is generally satisfactory; however, it is very costly to manufacture the rotors due to the confinement of the knife assemblies within recesses which have to be formed by laborious machining operations within solid steel discs of great diameter and thickness. While the Durkee device was developed intially to obviate this problem, the resulting chipping knife mounting structure is complicated in nature and far from rugged in construction.

Accordingly, the primary object of the present invention is to provide a wood chipper of the above described general type which is efficient in operation, durable in construction and simple and economical to manufacture.

Another object of this invention is to provide an improved disc mounting for the rotating knives of the rotary chipper whereby machining operations of a gouging nature are eliminated and a more economical manufacturing operation results.

Another important object of this invention is to provide various improvements in the construction of the rotary chipper discs whereby parts of the knife mounting may be easily removed and adjusted with a minimum effort and at a moderate cost.

Still another object of my invention is to produce a unit which is extremely durable in construction and able to reduce large quantity of waste wood material of substantial size to wood chips without damaging the rotary disc or its associated knife mounting means.

These and other objects of this invention will be apparent from the following description, wherein it will be noted that generally the improvement is the provision of rotating heavy steel disc mounted on a horizontal shaft, said disc having an annular series of radial knives mounted in unitary knife mounting means which are easily received in recesses in the disc.

A clear, concise picture of the improvements in rotary wood chipping discs and their associated cutting or chipping knives and mounting means may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference numerals designate the same parts in the various views.

FIGURE 1 is a front view of the wood chipping rotor and its associated housing and driving means having part of the housing broken away to show the upper half of the rotary chipping disc and the unitary mounting means and chipping knives thereon.

FIGURE 2 is a top view of the machine as shown in FIG. 1 having the housing removed above the line 2—2 of FIG. 1 and showing the associated wood feed chute and disc drive means.

FIGURE 3 is an enlarged view in developed section along line 3—3 of FIG. 1 with said line in straight line relationship and wherein a portion of the wood feed chute is shown adjacent thereto to illustrate the feeding and chipping operation.

FIGURE 4 is an exploded view in perspective to a portion of the rotary chipper disc and its associated knife mounting means, knife and face plate.

While the invention shown and described herein has been termed a wood chipping cutter, it is not intended to unnecessarily restrict the uses of the invention to the manufacture of wood chips by virtue of this limited description.

Referring to the drawings, the wood chipping unit comprises an upright housing 2 adapted for mounting on a horizontal surface. Bearings 4 are integrally associated with opposite sides of said housing and a shaft 6 is rotatably mounted in said bearings and adapted to rotate about a horizontal axis transverse to said housing. One end of shaft 6 extends beyond one bearing and has mounted adjacent its end a series of pulleys 8. Driving pulleys 8 are a series of belts 10 which derive their power from a source not shown. A circular chipping rotor 12 is mounted on shaft 6 within housing 2 for rotation with shaft 6 in a plane perpendicular to the axis of shaft 6. Adjacent a lower quadrant of rotor 12 and extending through housing 2 is a wood stock feed chute 13.

The chipping rotor comprises a disc 14 fashioned of heavy steel stock having first and second planar faces 16 and 18, and a series of annular, radially extending slots 20 through disc 14 connecting the first and second faces. Slots 20 have first and second radial sides 22 and 24.

As seen in FIG. 3, sides 22 and 24 diverge in extending between faces 16 and 18, side 22 diverging at an angle approximately perpendicular to the first face 16 and side 24 diverging at an angle θ of approximately 15° from a plane parallel to the aforementioned plane. Secured by weld 27 to the second side 18 of disc 14 adjacent each radial slot is a backing plate 26 which extends partially over the slot. Blade mounting block 28, as shown in disassembled relation in FIG. 4, and seated in its operative position in FIG. 3, has side 34 providing a snug and solid fit between side 34 of mounting block 28 and side 22 of disc 14. Weld 30 secures block 28 to backing plate 26 and weld 32 secures block 28 to disc 14 at the juncture of side 22 and face 16.

Seated in a triangular shaped recess in mounting block 28 are adjustably mounted knife 36 and chipper wear plate 38, both extending at an angle of approximately 40° to the first face 16 of disc 14. Knife 36 is adjustably mounted in said recess, having shims 40 or equivalent structure adapted to position blade 36 relative to the first face 16 of the rotating disc and provide a knife wear compensating means. Clamping each knife 36 in its correpsonding recess is a knife clamping plate and face plate 42 which has a bolt 44 with head 45 recessed in well 47 extending therethrough and through bolt holes 46 in the mounting block and 48 in backing plate 26 to be locked in blade holding relation by nut 50 and locknut 52. A chip delivery recess remains between face 54 of

mounting block 28 and side 24 of disc 14. Adjacent side 24 is face plate 56 which is removably secured to disc 14 by means of bolts extending through holes 60 and 62 of the face plate and the disc respectively. Varying sizes of face plates 56 are interchangeably mounted on the first face 16 of disc 14 to provide control of the chip size being cut by blade 36.

The construction, operation and functions of my invention are generally as follows:

Radial slots 20 are drilled or cut in heavy steel disc 14 and machined to specifications. Backing plates are welded adjacent to and overlapping the slots and a unitary mounting block 28, easily pre-machined to size is seated against the backing plate and side 22 of the slot. The block is welded to the disc at 32 and to the backing plate at 30. A chipping knife 36 and chipper wear plate 38 then can be clamped in the recess 35 in the block and bolted through a knife clamping plate 42 and the block to the backing plate. Face plate 56 is then bolted to the disc 14 and the plate overlies the chip delivery recess on one end and the blade mounting block 28 at its other end. This construction is rugged, allowing high chipping disc speeds and large size wood block feed and it is economical to manufacture as it eliminates the use of costly deep milling machinery. As seen in FIG. 3, in operation, wood stock is fed in chute 13 where it engages the rotating knives successively, yielding chips 66 which are delivered through disc 14 via the chip delivery recess remaining between block 28 and side 24 of slot 20. Lines of force developed as the blade 36 cuts through the wood stock 64 are transmitted directly through block 28 to the heavy metal disc 14 eliminating possible weak points inherent in surface mounted knives wherein the shear forces on the knife mounting structure as shown in Durkee necessarily limit the size of wood stock fed to the chipper and the speed of operation possible. Thus, my invention combines the strength and performance characteristics of a solid disc having a blade mounting recess deep milled therein and the economy and ease of manufacture of a rotary woodcutting disc having the blade mounting and blade structure mounted on one of its planar faces.

I claim:

1. A chipping rotor comprising a disc body having spaced planar faces, a radially disposed slot extending inwards from a planar face into the body of the disc, said slot enclosed by spaced top and bottom planar walls and spaced side walls connecting the top and bottom walls, a knife mounting block seated in said slot within the body of the disc against at least some of the enclosing walls of the slot, the front of said block not projecting substantially beyond a planar face of the disc, means securing said block in said slot, a recess in said block, and a chipper knife mounted in said recess and extending out of said slot.

2. A chipping rotor comprising a disc having spaced first and second planar faces perpendicular to the axis of rotation of said disc, a radially disposed slot extending inwards from the disc faces, said slot having top, bottom and side planar walls connecting said disc faces, a unitary knife mounting block within said slot secured at the juncture of a planar face and a planar side wall, said block extending entirely through said slot and occupying a portion thereof, a backing plate removably secured to the second planar face of the disc and to the block, a recess in said block, a chipping knife adjustably mounted in said recess and extending out of said slot, and a removable face plate mounted on said first disc face and overlapping a portion of the slot for adjusting the length of the chips cut by said knife, said chips adapted to pass through the portion of the slot not occupied by said block.

References Cited in the file of this patent

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