Aug. 14, 1923. 1,464,690

D. C. ANDREWS

WOOD CHIPPER

Filed March 23, 1923

Fig. 1.

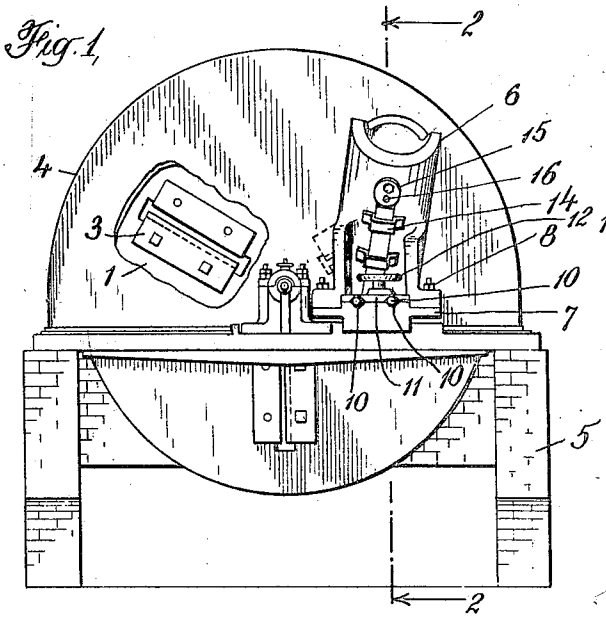


Fig. 2.

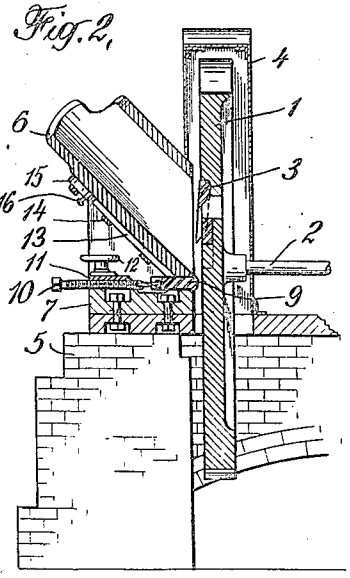


Fig. 3.

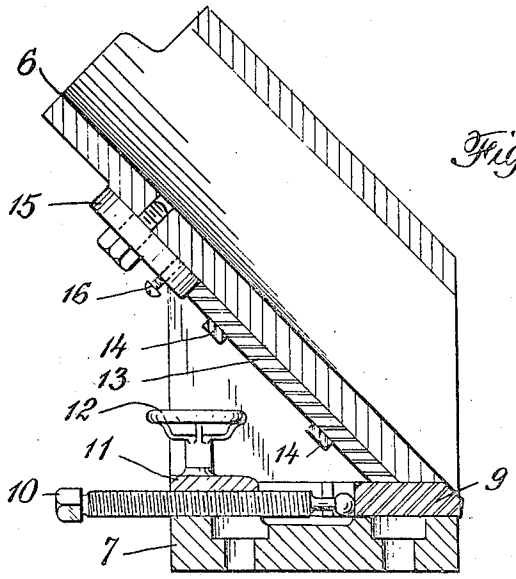
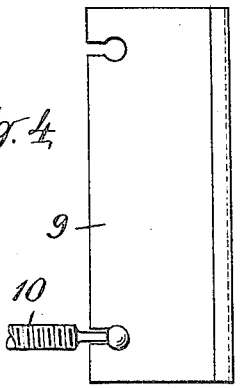


Fig. 4.



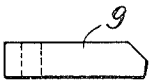


Fig. 5.

INVENTOR.
Dennis C. Andrews
BY
Dennis Davis Marvin & Edmonds.
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

DENNIS C. ANDREWS, OF CLOQUET, MINNESOTA.

WOOD CHIPPER.

Application filed March 23, 1923. Serial No. 627,008.

To all whom it may concern:

Be it known that I, DENNIS C. ANDREWS, a citizen of the United States, residing at Cloquet, in the county of Carlton, State of Minnesota, have invented certain new and useful Improvements in Wood Chippers; 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 improvements in wood chipping machines of the type commonly used for the purpose of cutting wood into chips preparatory to making pulp therefrom. Wood chipping machines of this general type comprise a rotatable disc carrying one or more knives, a feeding spout or trough adapted to bring the wood into contact with the rotatable disc, and a stationary knife arranged so that it may coact with the knife or knives on the rotatable disc to cut off or shear chips from the wood.

During the normal use of wood chipping machines of the type above described, considerable wear takes place in the immediate vicinity of the cutting knives and the lower end of the feeding spout. This wear is caused by the thrashing around or pounding of the wood within the spout, due to the rotating knives striking the wood. In order to prevent excessive wear of the feeding spout proper, it has been found advisable heretofore to provide a removable wear plate near the lower end of the feeding spout, this wear plate being secured to the spout by means of bolts passing through the plate and spout. After the plate has become considerably worn, it is necessary to remove the bolts in order to replace the wear plate with a new one. This operation of renewing the wear plate involves not only the expense of replacing the wear member with an entirely new one, but also the expense resulting from the interruption in the operation of the machine.

Another disadvantage of the wood chippers now in general use, lies in the fact that the wear plate and stationary knife form separate parts of the chipping machine. The wear plate extends into close proximity to the stationary knife in order that it may form a support for the wood in the feeding spout when the chipping or cutting is taking place; but no matter how nice the adjustment of the various parts, it is not possible to avoid the presence of at least a small gap between the wear plate and the stationary knife. When even a small gap is present at this point, a relatively large number of slivers and a considerable quantity of fine wood dust are produced. This is caused by the splitting of the wood adjacent to this gap, due to the lack of support at this point while the cutting is taking place. The presence of slivers and wood dust in the chips makes it impossible to produce pulp of the best grade, and it is therefore desirable to limit as much as possible the production of these undesirable constituents.

One of the principal objects of this invention is to provide a wood chipper wherein no gap at all is formed between the stationary cutting edge and the wear member. This object may be attained by providing a cutting tool of such construction that it has not only a cutting edge but also a portion adapted to serve as a wear member, and providing a spout having a continuous surface extending into direct contact with the cutting tool. The portion of the cutting tool or knife adapted to serve as a wear member takes the place of the wear plate now in common use.

This invention may be best understood by referring to the following detailed description which is to be considered in conjunction with the accompanying drawings in which:

Fig. 1 is an elevation of the improved wood chipping machine, certain parts being broken away to show the details of construction.

Fig. 2 is a longitudinal vertical section taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged section view of the feeding spout, stationary knife and associated parts, shown in Fig. 2.

Fig. 4 is a plan view of the improved stationary knife; and

Fig. 5 is an end elevation of the stationary knife shown in Fig. 4.

The embodiment of the invention shown in the accompanying drawing comprises a rotatable disc 1 mounted on a shaft 2 and driven by any suitable source of energy (not shown). This disc 1 is provided with one or more substantially radial slots, and a knife 3 mounted near each slot. The knife 3, shown in the drawing, projects out from

the surface of the disc 1, and the distance between the cutting edge of the knife and the disc 1 determine the thickness of the chips produced. A casing 4 encloses the upper portion of the disc 1, and the lower portion of this disc extends down into a pit such as that formed by the walls 5 of the substructure of the machine. A feeding spout 6, eccentrically located with respect to the axis 4 and inclined at an angle to the horizontal plane through this axis, projects through the casing 4 into close proximity to the disc 1. This spout 6 may be fixed to the bed plate 7 by means of suitable bolts 8. The particular spout illustrated in the drawing is circular, however, it is obvious that a spout of rectangular or other suitable cross-section may be employed.

The improved stationary knife 9 is supported at substantially right angles to the disc 1 by the bed plate 7, and is adapted to be advanced or retracted by means of adjusting screws 10, 10, which have a ball and slot connection with the knife. (See Fig. 4.) These screws 10 engage screw threads in the bed plate 7, and the screws may be fixed in any desired position by clamping the block 11 tightly against them. This block 11 may be clamped in place by means of a central bolt passing through this block and into the bed plate, this bolt being turned by means of the hand wheel 12. A wedging bar 13 is supported by keepers 14 fixed to the underside of the spout 6. This bar is adapted to be forced against the upper face of the stationary knife 9 by turning the eccentric 15, located at the upper end of the bar. This eccentric 15 is pivoted on a suitable support carried by the spout and it is adapted to be fixed in any desired position by means of the set screw 16.

When the stationary cutting tool 9 has become worn or dull it may readily be removed by merely loosening the eccentric 15 and the clamping block 11 and withdrawing the tool by means of the adjusting screws 10. The tool may then be ground so as to sharpen the cutting edge and to give the beveled upper blunt edge the desired inclination so that when the tool is again placed in position in the machine this edge will form a continuation of the feeding spout. It is therefore evident that the improved wood chipper may be kept in excellent working condition with a minimum of expense. The wear member does not have to be replaced by a new part as is the case with the wood chippers now in common use and the operator may be certain that as long as the cutting edge is sharp, the portion of the tool serving as a wear member is also in proper condition.

The improved cutting tool or stationary knife 9 preferably comprises a single piece of tool steel ground so that it has what may be termed an obtuse tool angle—that is, the tangent of the angle between the lower active face of the tool and the disc 1 is one-sixteenth. Good results may be obtained by using a tool having a clearance angle or bottom rake of 1:16. The upper active face of the cutting tool or knife 9 is ground so that when the tool is placed in the chipping machine this face is parallel with and forms a substantially continuous extension of the inner face of the feeding spout, this being clearly shown in Fig. 3. The point of contact between the inner face of the spout and the cutting tool or knife 9 is at considerable distance from the cutting edge of the knife. Therefore, the thrashing or pounding of the wood in the feeding spout does not have a tendency to produce a gap between these parts; and even if such a gap were produced it would have no effect on the cutting of the wood, for the wood is firmly supported at the point of cutting by the upper active face of the cutting knife.

I have found that wood may be reduced to chips much more efficiently when my improved wood chipper is used, than when an ordinary wood chipper is employed. In fact, when the improved chipper is used, the amount of waste produced is only one-fifth of that ordinarily produced,—the amount of wood dust being approximately one-quarter of the amount of dust produced by the ordinary wood chipper. Therefore, when the improved wood chipper is used, it is possible to produce wood pulp of much superior quality to any pulp which can be made from chips produced by the ordinary chipper.

It is to be understood that the size and proportions of the various parts may be varied without departing from the principle of the invention which is not confined to the particular embodiment shown and described, but is intended to include such modifications thereof as fall within the scope of the appended claims.

I claim:

1. A cutting knife for a wood chipper of the class described, said knife being adapted to cooperate with a knife rotated in a plane at substantially right angles to said cutting knife, and said cutting knife having its upper front edge beveled to serve as a continuation of the feeding spout.

2. In a wood chipper having a feeding spout and a cutting knife attached to a rotatable disc, a stationary knife having an obtuse tool angle and having a portion thereof forming a continuation of the feeding spout, said stationary knife being arranged at substantially right angles to said disc.

3. In a wood chipper having a feeding spout and a cutting knife attached to a rotatable disc, a unitary member having a cutting edge and a portion forming a continuation of the feeding spout, said member

being removably and adjustably mounted at the delivery end of the feeding spout at substantially right angles to said disc.

4. In a wood chipper having a cutting knife attached to a rotatable disc, a stationary cutting knife arranged at substantially right angles to said disc and having its upper front edge beveled, and a feeding spout having the inner surface thereof extending into direct contact with said stationary knife, the upper beveled edge of said stationary knife forming a continuation of said feeding spout.

5. In a wood chipper having a cutting knife attached to a rotatable disc, a stationary cutting knife arranged at substantially right angles to said rotatable disc, a bed plate supporting said stationary knife and arranged at substantially right angles to said rotatable disc, a feeding spout having the inner surface thereof extending into direct contact with said stationary knife, and means for adjusting said stationary knife toward and away from said disc, said stationary knife having a beveled edge forming a continuation of said feeding spout.

In testimony whereof I affix my signature.

DENNIS C. ANDREWS.