March 24, 1936. A. M. KIRKWOOD 2,034,908

LOG DEBARKING CUTTER HEAD

Filed Aug. 3, 1931 2 Sheets-Sheet 1

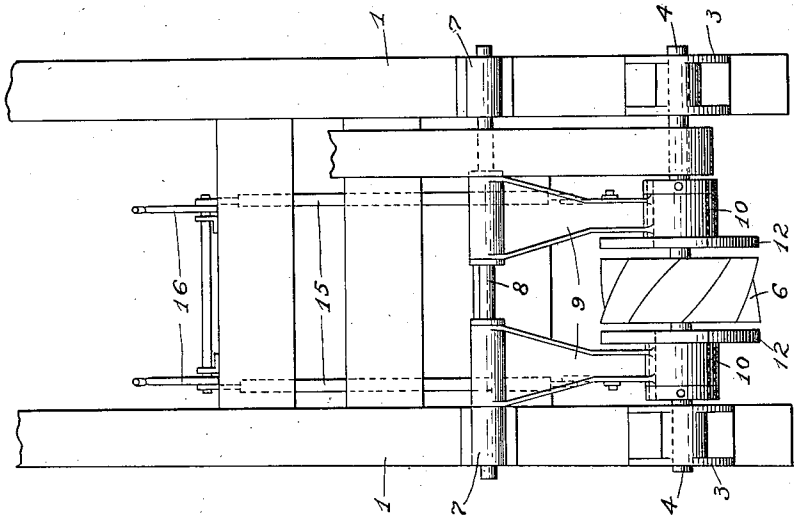


Fig - 2.

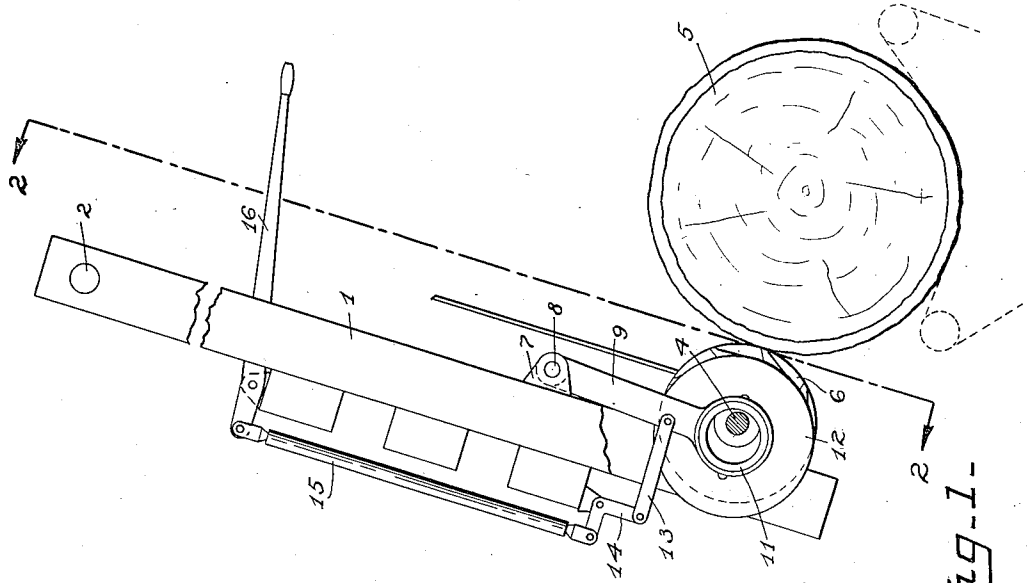


Fig-1.

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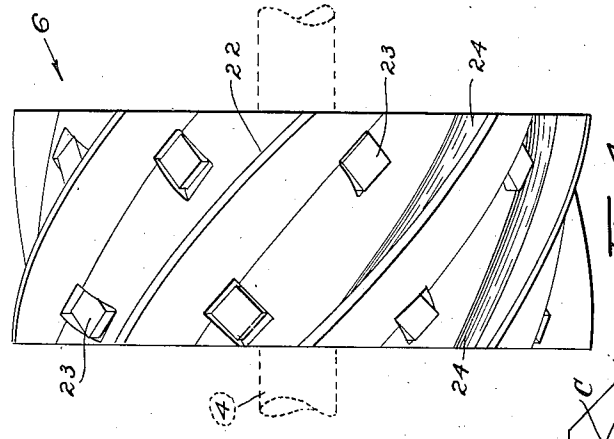


Fig. 4.

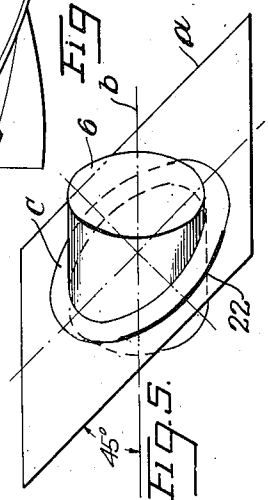


Fig. 5.

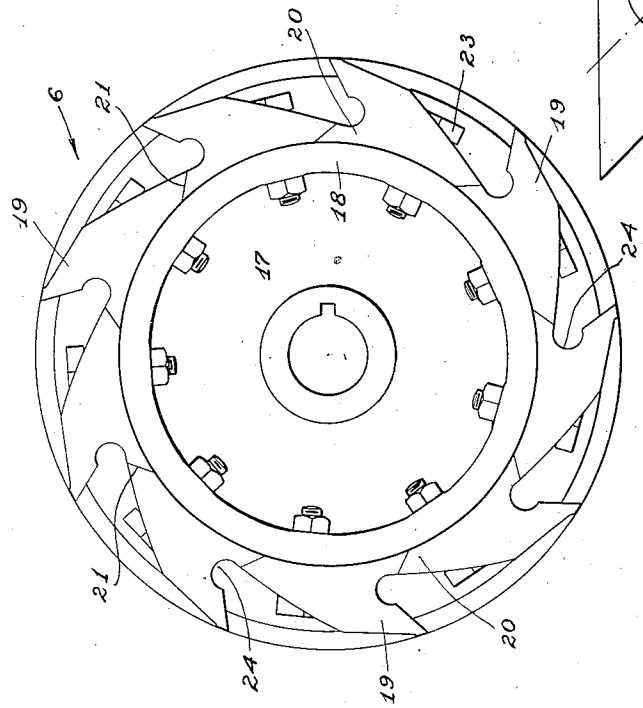


Fig. 3.

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UNITED STATES PATENT OFFICE

2,034,908

LOG DEBARKING CUTTER HEAD

Arthur M. Kirkwood, Portland, Oreg.

Application August 3, 1931, Serial No. 554,896

6 Claims. (Cl. 144—218)

My invention relates to improvements in log debarking cutter heads and it consists of the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide a log debarking cutter head in which the knives are formed integral with base portions and these base portions are curved and removably secured to a wheel, the base portions interlocking with each other when secured and therefore forming a complete band around the wheel. The bases are bolted through the rim of the wheel and therefore the strain from the knives will be distributed to all of the bolts. The cutting edges of the knives are inclined at approximately 45 degrees with respect to the axis of the cutter and the knives are spaced one from the other so that the point of one knife contacts with the log shortly before the heel of the preceding knife leaves the log.

The knives are provided with gullets disposed between each knife and this affords clearance for chips and the chips will be automatically expelled from the knife and in this way the knife is prevented from becoming clogged. The 45 degree angle of each knife gives a slashing cut and this same angle also aids in expelling the chips from the gullets because the first or loose end of each chip is pulled from the gullet before the last end is cut loose from the log.

I also provide novel means for gauging the depth at which the cutter enters the log so that only the bark of the log is removed. The gauging means is adaptable so that the cutter can move longitudinally in either direction along the log.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming a part of this application, in which

Figure 1 is a side elevation of the gauge and cutter showing parts of the supporting frame in section;

Figure 2 is a front elevation;

Figure 3 is a side elevation of the cutter;

Figure 4 is a front elevation of the cutter; and

Figure 5 is a diagrammatic view illustrating the disposition of the cutting edges of knives carried by the cutter.

In carrying out my invention I provide a frame 1 which is pivoted at 2 and which has bearings 3 for supporting a shaft 4. The structure of the frame 1 is set forth in my copending application, Serial No. 359,833, filed May 2, 1929, now Patent #1,855,577 issued April 26, 1932, and it is sufficient to state in the present case that the frame is swingable toward a log 5 by means of gravity.

A cutter 6 hereinafter described is mounted upon the shaft 4 and is rotated by the shaft. Any means for rotating the shaft may be used, as for example the means shown in my copending application above set forth.

The frame 1 carries brackets 7 which in turn support a shaft 8. Arms 9 are rotatably mounted on the shaft 8 and have ring shaped ends 10 for supporting a hub 11. The hub encloses portions of the shaft 4 and is large enough in diameter to permit lateral movement of the hub with respect to the shaft. This movement is caused by the swinging of the arm 9. A guide roller 12 is rigidly mounted on each hub 11 and can be moved relative to the cutter 6 by the following mechanism.

A link 13 is pivoted to the arm 9 and to a bell crank lever 14. The bell crank lever is carried by the frame 1 and has its free end connected to a link 15 which in turn is operatively connected to a lever 16. The lever 16 is manually actuated for moving the arm 9 and the roller 12 transversely with respect to the cutter 6. In the present form of the device I show two rollers and two separate levers 16 for moving the rollers laterally.

During the operation of the device the log 5 is rotated and the frame 1 is moved along the length of the log. During this movement the cutter is rapidly rotated and will remove the bark from the log in a spiral manner. The depth of the cut is determined by either one of the rollers 12. When starting the operation the roller bearing against the bark is moved away from the bark and into a position to expose sufficient cutting edge to remove the bark. After the log has been rotated through one complete revolution the roller 12 to the rear of the advancing cutter 6 can be moved into a concentric position with respect to the cutter so as to ride on the portion of the log already freed of bark and to determine the depth of cut made by the cutter during the rest of the operation. The roller 12 in advance of the cutter is swung into an out of the way position. The swinging of the rollers is accomplished by the manual operation of the levers 16.

The particular construction of the cutter is shown in Figures 3 and 4 and it will be noted

that the cutter 6 comprises a wheel 17 having a rim 18 and receiving a shaft 4.

Around the rim 18 I mount a plurality of knives 19 and these knives have integral bases 20 that in turn have their inner surfaces curved to conform with the rim 18. The front and back edges of the bases 20 are inclined as at 21 so as to interlock with each other and to form a rigid band around the wheel. The knives 19 have cutting edges 22 that extend at approximately 45 degrees to the axis of the shaft 4 and the front and back edges 21 of the bases 20 are inclined at approximately the same angle. The bases 20 have openings for receiving bolts 23 and Figure 3 shows how these bolts are secured to the rim 18 of the wheel 17.

The bases 20 interlocking with each other form a band around the wheel which is strong enough to be driven at high speeds and to move the knives 19 through knurls and hard knots. The interlocking of the base segments also distributes the strain from the knives to all of the bolts 23. Due to the fact that one knife contacts with the work slightly before the preceding knife leaves the work, there will be a continuous contact of one or more cutters on the work and this will aid the cutter in cutting to the desired depth at all times. The formation of the gullets 24 between each knife prevents the knives from becoming clogged with chips. The cutting edges of the knives 19 are not spiral, but are on a 45 degree angle and are equi-distant from the axes of the cutter. More specifically and by reference to Figure 5 it will be seen that the cutting edge 22 of any one of the knives 19 lies parallel to a flat plane *a* obliquely intersecting the axis *b* of the cutter 6 at 45°. The cutting edge actually forms a portion of an imaginary ellipse *c* lying in the plane *a* and having its center coinciding with the axis of the cutter, all as clearly shown in this figure. The angle at which the frame 1 extends with respect to the log 5 causes the cutter to be forced into the bark by gravity and the pendulum action of the frame 1 provides a more perfect cut regardless of the size of the log. The knives 19 also prevent the work from moving into the cutter so as to strike the base portions 20, because the cutting edge of at least one knife is always in engagement with the work. This prevents the log from becoming gouged from time to time during the cutting operation.

Although I have shown and described one embodiment of my invention it is to be understood that the same is susceptible of various changes and I reserve the right to employ such changes as may come within the scope of the claims hereto annexed.

I claim:

1. A cutter comprising a wheel having a rim, a plurality of knives having base portions with front and back edges extending at an angle to the axis of the wheel, the cutting edges of the knives extending at the same angle and being long enough so that the heel of one knife will still be engaging with the work when the toe of the succeeding knife comes into contact with the work, the front and back edges of each base being bevelled and contacting the complementary edges of the next base so that the bases will interlock with each other and form a band around the rim, and bolts securing the bases to the rim.

2. A cutter comprising a wheel having a rim, a plurality of knives having curved base portions beveled at their front and rear edges in the same direction so as to interlock with each other and to form a continuous band around the rim coextensive with the width of the rim, and means for securing the bases to the rim.

3. A cutter comprising a wheel having a rim, knives on the rim and having bases with beveled edges, the base edges contacting with each other for forming a continuous, wide and rigid band around the rim, and means for removably securing each knife to the rim, the cutting edges of the knives extending longitudinally of and at an angle to the axis of the wheel and spaced one from the other so that the cutting edge of at least one knife will always be in engagement with the work during the cutting operation.

4. A cutter comprising a wheel having a rim, knives disposed around the rim and having bases with beveled edges, the base edges abutting each other to form a continuous, wide and rigid band around the rim, and means for removably securing each knife to the rim, the cutting edges of the knives extending longitudinally of and at an angle to the axis of the wheel and spaced one from the other so that the cutting edge of at least one knife will always be in engagement with the work during the cutting operation, said knives having gullets disposed between their cutting edges and their bases and being coextensive with the lengths of the latter.

5. In a log debarking device, a cylindrical cutter head having a circumferential series of knives arranged on the periphery thereof, the knives being angularly disposed so that the length of the cutting edge of any one knife will lie parallel to a flat plane obliquely intersecting the axis of the head and forming a segment of an ellipse the prolongation of the length of such cutting edge of said head completing the ellipse and defining a circle when viewing the cutter head axially, so that the cutting edge will be equi-distant from the axis of the head along the length of the knife.

6. In a log debarking device, a rotary cutter head having a circumferential series of knives on the periphery thereof, the lengths of their cutting edges extending obliquely relative to the axis of the cutter head, the effective lengths of the cutting edges in a direction axially of the cutter head being less than the diameter of a circle through which the cutting edges move during rotation of the cutter head, and the obliquity of the knives being such as to obtain a relatively short cutting contact with the periphery of a log to be debarked and to effect slashing cuts upon the log in order to cleanly remove shavings from the log, the front face of each knife having a gullet therein coextensive in length with the knife and from which the shavings are ejected at the heel end of the knife as the shavings are removed from the log whereby to prevent the shavings from packing in front of the knife with the attendant failure of the knife to cut.

ARTHUR M. KIRKWOOD.