

P. S. MITTS.
MACHINE FOR MAKING SAWDUST.
APPLICATION FILED APR. 20, 1914.

1,209,319.

Patented Dec. 19, 1916.

2 SHEETS—SHEET 1.

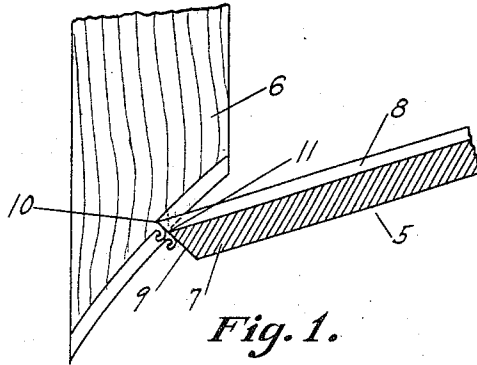


Fig. 1.

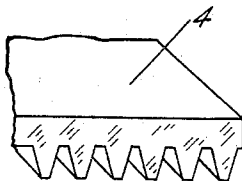


Fig. 8.

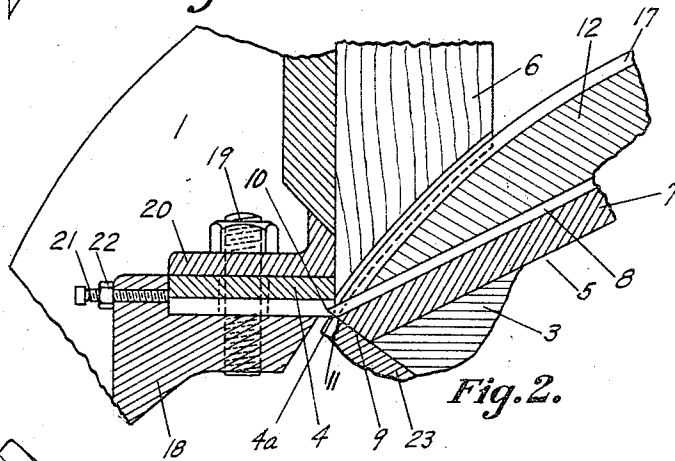


Fig. 2.

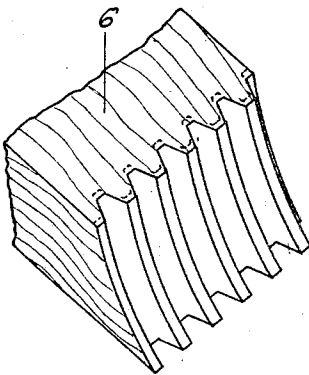


Fig. 3.

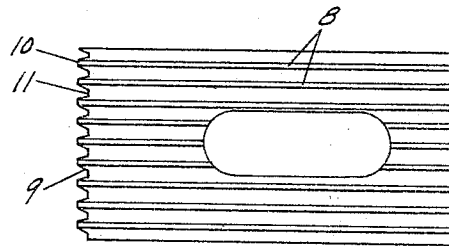


Fig. 7.

WITNESSES

Frank L. Martindale
Roy Wallis

Philip S. Mitts.

INVENTOR

BY

Geo. B. Wilcox

ATTORNEY

P. S. MITTS.
MACHINE FOR MAKING SAWDUST.
APPLICATION FILED APR. 20, 1914.

1,209,319.

Patented Dec. 19, 1916.

2 SHEETS—SHEET 2.

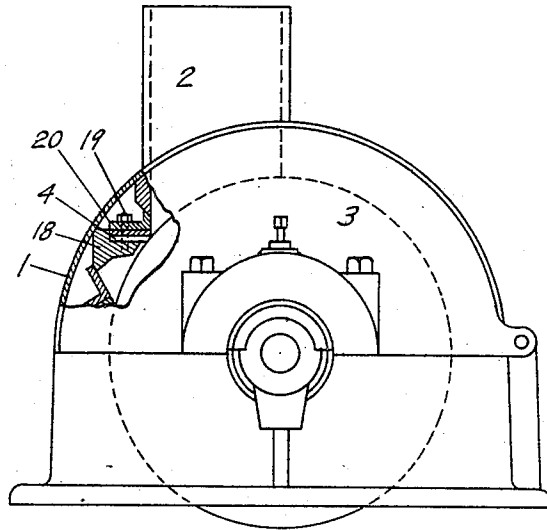


Fig. 4.

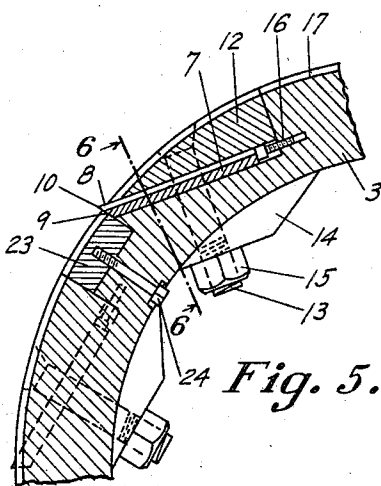


Fig. 5.

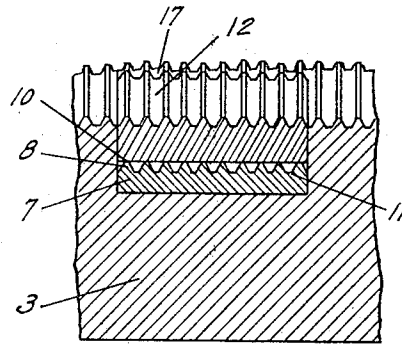


Fig. 6.

WITNESSES

Frank L. Martindale
Roy Waller

INVENTOR

Philip S. Mitts

BY

Geo. B. Willcox

ATTORNEY

UNITED STATES PATENT OFFICE.

PHILIP S. MITTS, OF SAGINAW, MICHIGAN.

MACHINE FOR MAKING SAWDUST.

1,209,319.

Specification of Letters Patent.

Patented Dec. 19, 1916.

Application filed April 20, 1914. Serial No. 833,124.

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 Machines for Making Sawdust; 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 is a disintegrating machine adapted to many uses in the arts, such for example as making sawdust, and in this specification I will describe this machine as a sawdust-making machine.

The improvement pertains more particularly to that class of machines in which a cylindrical drum, on which cutter knives are mounted, operates in conjunction with stationary cutter bars, the material being fed to the cutters along a hopper or equivalent device.

My invention pertains more particularly to the construction, arrangement and combination of the drum, the cutting knives and the stationary cutter bars, whereby the objects of my invention are attained.

These objects are, first, to provide a machine of the class described, with cutter bars and cutting knives adapted to operate upon a piece of wood in such a manner that the piece will be progressively severed and converted into sawdust of a substantially uniform degree of fineness.

My invention also includes means for controlling the degree of coarseness or fineness of the product by providing means for properly setting the relative positions of the knives and cutter bars.

A further object is to so construct the knife and the cutter bar, that the cutting edges of the knife will cut across the grain of the wood by a shaving or chiseling movement, shearing rather than tearing the fibers of the wood, the cutting action taking place partly at the end of the piece of wood and partly at the bottom of grooves or mortises formed in the wood, the mortises progressively advancing into the wood as the cutting action proceeds. Means is also provided for preventing the formation of splinters when a piece of wood passes sidewise through the knives.

Another object is to insure a clean shearing action between the cutting edges of

the knife and the corresponding edges of the cutter bars, so that as the knife emerges from the wood it will not tear the wood, but shear it clean, thus producing sawdust free from splinters and slivers.

A still further object is to provide a cutter-knife and cutter bar capable of performing the above functions and so constructed that both the knife and the cutter bar may be sharpened by grinding in the same manner that ordinary straight-edge knives are ground, thus reducing the cost of upkeep of the knives and cutter bars.

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

In the drawings: Figure 1 is a view showing the manner in which the sawdust is removed from the end grain of a piece of wood, the cutting action of the ribs and the roots of the knife being diagrammatically indicated. Fig. 2 is a similar view showing the cutting members of the knife and cutter bar in the relative positions they occupy when the knife is about to leave the wood. Fig. 3 is a perspective showing the end of such a piece of wood partly cut, the positions of the next succeeding cuts at the points and roots of the knife edges being indicated by dotted lines, the drawing being exaggerated for the purpose of illustration. Fig. 4 is a side view of the sawdust machine. Fig. 5 is a part sectional detail through a portion of the cylindrical drum, showing the means by which the knives are preferably mounted in the drum. Fig. 6 is an enlarged transverse section through the knife and drum taken on line 6—6 of Fig. 5. Fig. 7 is a top plan view of the knife. Fig. 8 is a part sectional view of a cutter bar.

As is clearly shown in the drawings, the machine consists in the housing 1 having a feed hopper or equivalent 2, a cylindrical drum 3 revolvably mounted in the housing and adapted to be revolved by any suitable means, and fixed cutter bars 4 mounted on the housing 1 and adapted to co-act with knives 5 carried by the cylindrical drum, the cutting edges of the knives projecting beyond the periphery of the drum.

6 represents a piece of wood to be reduced to sawdust. This wood is fed to the knives through the hopper 2 in any suitable manner, as by gravity, or by any suitably-con-

trolled feed (not shown). That part of the mechanism which has to do particularly with my present invention will now be described.

5 First, referring to the diagrammatic views, Figs. 1, 2 and 3—in Fig. 1, numeral 7 represents the body of the knife 5; and 8 represents a plurality of longitudinal ribs formed on the upper face of the knife. The
10 construction of these ribs and the serrations between them are clearly shown in Figs. 6 and 7. 9 indicates the lower beveled cutting end of the knife. 10 indicates the cutting points of the ribs, and 11 the bottoms of the
15 serrations, or as I prefer to designate them, the roots of the ribs.

It will be seen from Fig. 1 that the knife as it shears down across the end of the work 6, severs simultaneously not only at the points
20 of all the ribs 10, but also at their sides and at their roots 11, the roots being arranged to project a short distance outward beyond the body of the grooved cylindrical drum 3, as shown in Fig. 2, to enable the points to shear
25 off the same thickness that is sheared by the roots.

The fineness or coarseness of the product may be controlled in either of two ways—
30 First, by allowing the bottoms of the grooves in the drum to act as the gage against which the work rests before a knife reaches the work, in which case the size of the piece cut off will be determined by the amount that the root of the knife projects beyond the
35 bottom of the groove of the drum; or second, by making the grooves of the drum deeper and allowing the tops of the ribs on the drum to act as the gage against which the work rests, in which case the size of the
40 piece cut off will be determined by the amount that the points of the knife project beyond the top of the ribs on the drum.

It will also be observed that the advancing
45 points 10 of the ribs 8 and their roots 11 are preferably straight, while the sides of any two adjacent ribs are preferably divergent, to more effectively sever the particles of wood, these particles being shaped as indicated by the dotted lines in Fig. 3.
50 The severed pieces are easily broken up by the action of the rapidly traveling knives.

When the knife is about to leave the work, as shown in Fig. 2, it will be seen that the
55 points of the ribs 10 traverse the corresponding serrations in the inner face of the cutter bar until the knife leaves the cutter bar. In entering the serrations of the cutter bar the inclined sides of the knife ribs shear close to the sides of the adjacent ribs of the cutter
60 bar, operating with a shearing action to cleanly sever the last fibers from the bottom of the work 6.

To insure proper cutting action between the knife 5 and the bar 4, I prefer to form
65 the ribs and serrations on the cutter bar and

the knife by milling them so that the ribs on the knife shear close to the complementary ribs of the bar.

To prevent the formation of slivers when a piece of wood passes through the machine
70 sidewise, *i. e.*, with the direction of the grain parallel with the axis of the drum, I preferably groove the periphery of the drum, as at 17, and permit the points of the ribs of the cutter bars to project into the grooves of the
75 drum, as indicated at 4^a in Fig. 2. Any sliver lodging under the projecting roots 11 of the knives and against the periphery of the cylinder will not pass unbroken through the machine, but will be immediately
80 chopped into lengths equal to the width of the ribs 8. Slivers are thus eliminated from the finished product.

When it is desired to sharpen the knife, the lower beveled cutting edge 9 may be
85 ground in the same way as a planer-knife, and to sharpen the cutter bar 4, the end of the bar may be ground in the same manner. The ribs and grooves or serrations of both the cutter bar and the knife retain their
90 original shape regardless of the number of times the knife and bar are sharpened.

The knife may be mounted on the drum 3 in any suitable manner, as by being
95 clamped by means of the filler-plates 12 that have bolts 13 passing through suitable lugs 14 formed on the cylindrical drum, the bolts being held by means of nuts 15, as shown in Fig. 5.

Various means may be employed for hold-
100 ing the knife against endwise movement. One such means is shown in Fig. 5, where 16 is a set screw threaded into the drum, the head of the screw bearing against the butt of the knife, the flat face of the head of the
105 screw lying about flush with the upper surface of the knife, so that the screw will be prevented from turning when the filler-plate 12 is in place.

A means of supporting the stationary cut-
110 ter bars and a means for adjusting them toward or from the knives is shown in Fig. 2, where 18 is a cutter bar support carried by the housing or frame of the machine. A cutter bar 4 is mounted on support 18, being
115 held by the stud and nut 19 and the angle iron clamp 20. The stud passes through an elongated hole in the cutter bar. The position of the bar may be adjusted by means of the set screw 21 threaded in support 18
120 and locked by the lock-nut 22.

Since most of the wear on the drum occurs just ahead of the cutting point of the knife, I prefer to make this part of the drum re-
125 newable, increasing its durability, by setting a block 23 of hard steel into the periphery of the drum, as shown in Fig. 5, fastening it in place by means of a cap-screw 24, or in any other suitable manner. The outer face of the block 23 is corrugated the same as the
130

periphery of the drum. In fact, the block normally forms a part of the drum periphery, but is renewable when its face becomes worn. The side of the block forms a shoulder against which the advancing end of the knife may be forcibly clamped by the set screw 16.

By the means above described, I have produced a machine for making sawdust that delivers a uniform product and has a high rate of production. The degree of fineness of the product may be fixed as desired, by the amount that the knife is permitted to project beyond the body of the drum, by the speed with which the work is fed to the knives, by the rotating speed of the drum, and by the size of the grooves and corrugations in the knives, cutter bar and cylinder.

I claim:

1. In a machine of the class described, the combination of a revoluble drum, knives secured to and projecting beyond the periphery of said drum, said knives comprising plates having longitudinal ribs and grooves formed on their outer faces, the ends of said knives being beveled to form cutting points and cutting roots, said roots projecting slightly beyond the periphery of the drum; stationary cutter bars having longitudinal ribs and grooves formed in the inner faces thereof, said bars disposed with their ends presented to the path of travel of said knives, the grooves of said bars adapted to receive the said cutting points of the knives.

2. In a machine of the class described, the combination of a revoluble drum having its periphery formed with ribs and grooves, knives secured to and projecting beyond the periphery of said drum, said knives comprising plates having longitudinal ribs and grooves formed on their outer faces and alined with the ribs and grooves of said drum, the ends of said knives being beveled to form cutting points and cutting roots, said roots projecting slightly beyond the periphery of the drum; stationary cutter bars having longitudinal ribs and grooves formed on the inner faces thereof, said bars disposed with their ends presented to the path of travel of said knives, the grooves of said bars adapted to receive the said cutting points of the knives.

3. The combination of a revoluble drum, knives secured to and projecting beyond

the periphery of said drum, said knives comprising plates having longitudinal ribs and grooves formed on their outer faces, the ends of said knives being beveled to form cutting points and cutting roots, said roots projecting slightly beyond the periphery of the drum; wearing blocks inserted in said drum in advance of the cutting edges of said knives, retaining means for said blocks; stationary cutter bars having longitudinal ribs and grooves formed in the inner faces thereof, said bars disposed with their ends presented to the path of travel of said knives, the grooves of said bars adapted to receive the said cutting points of the knives.

4. The combination of a revoluble drum, knives secured to and projecting beyond the periphery of said drum, said knives comprising plates having longitudinal ribs and grooves formed on their outer faces, the ends of said knives being beveled to form cutting points and cutting roots, said roots projecting slightly beyond the periphery of the drum; a wearing block sunk into the periphery of said drum in advance of the cutting edge of said knife, means for forcing the end of said knife against said wearing block, means for clamping said block to said drum, and means for clamping the knife to the drum.

5. In a machine of the class described, the combination of a revoluble drum having its periphery formed with ribs and grooves, knives secured to and projecting beyond the periphery of said drum, said knives comprising members having ribs and grooves formed on their outer faces and alined with the ribs and grooves of said drum, the ends of said knives being beveled to form cutting points and cutting roots, said roots projecting slightly beyond the periphery of the drum; stationary cutters having ribs and grooves formed on the inner faces thereof, said cutters disposed with their ends presented to the path of travel of said knives, the grooves of said bars adapted to receive the said cutting points of the knives.

In testimony whereof, I affix my signature in presence of two witnesses.

PHILIP S. MITTS.

Witnesses:

NELLIE M. ANGUS,
ROY WALLIS.