April 3, 1928. 1,664,806

R. O. BETTERLEY

CUTTER HEAD FOR WOODWORKING MACHINES

Filed Nov. 5, 1924 2 Sheets-Sheet 1

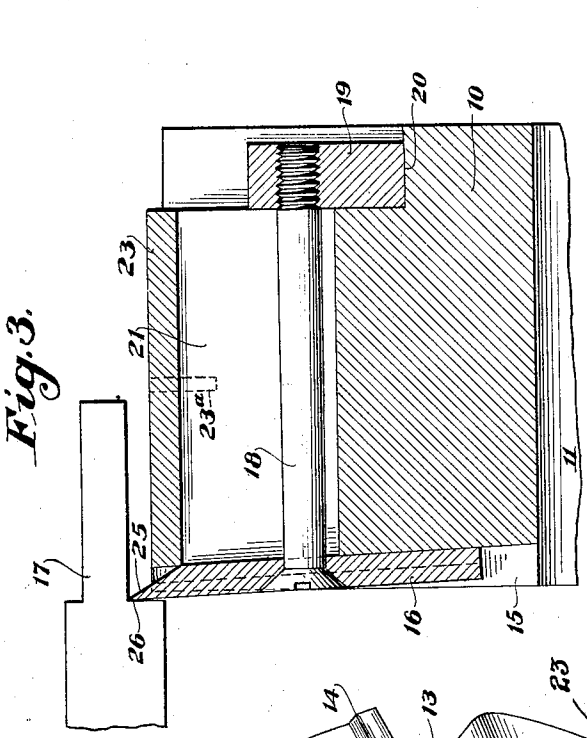


Fig. 3.

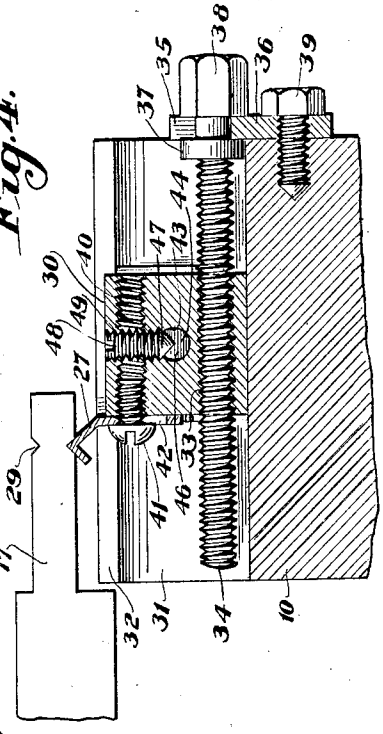


Fig. 4.

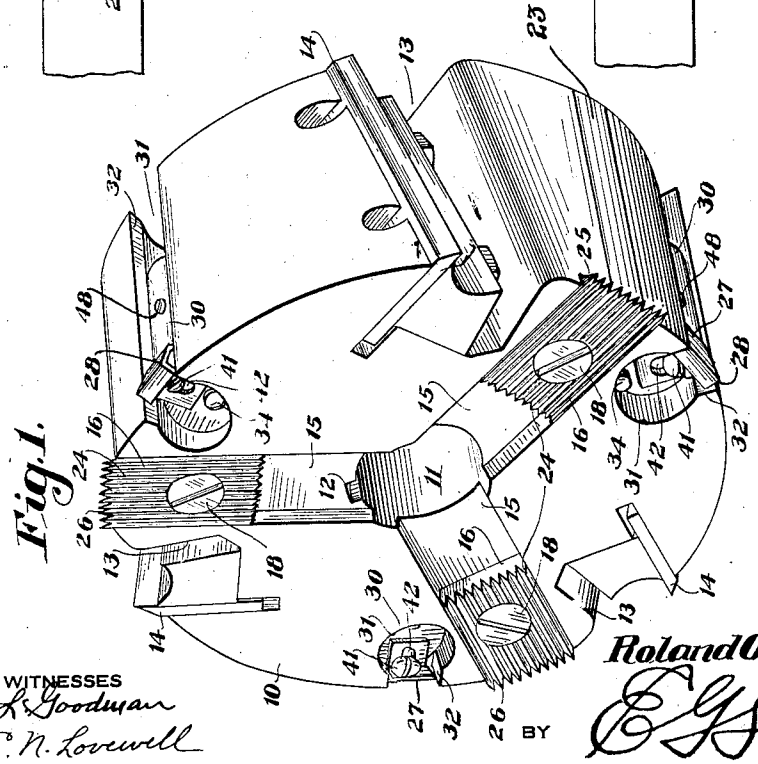


Fig. 1.

WITNESSES

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CUTTER HEAD FOR WOODWORKING MACHINES

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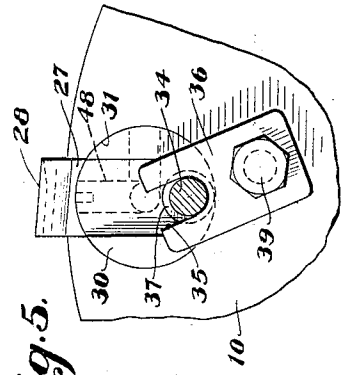


Fig. 5.

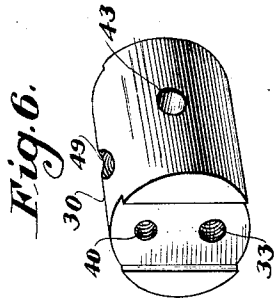


Fig. 6.

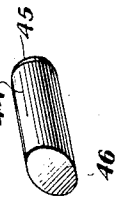


Fig. 7.

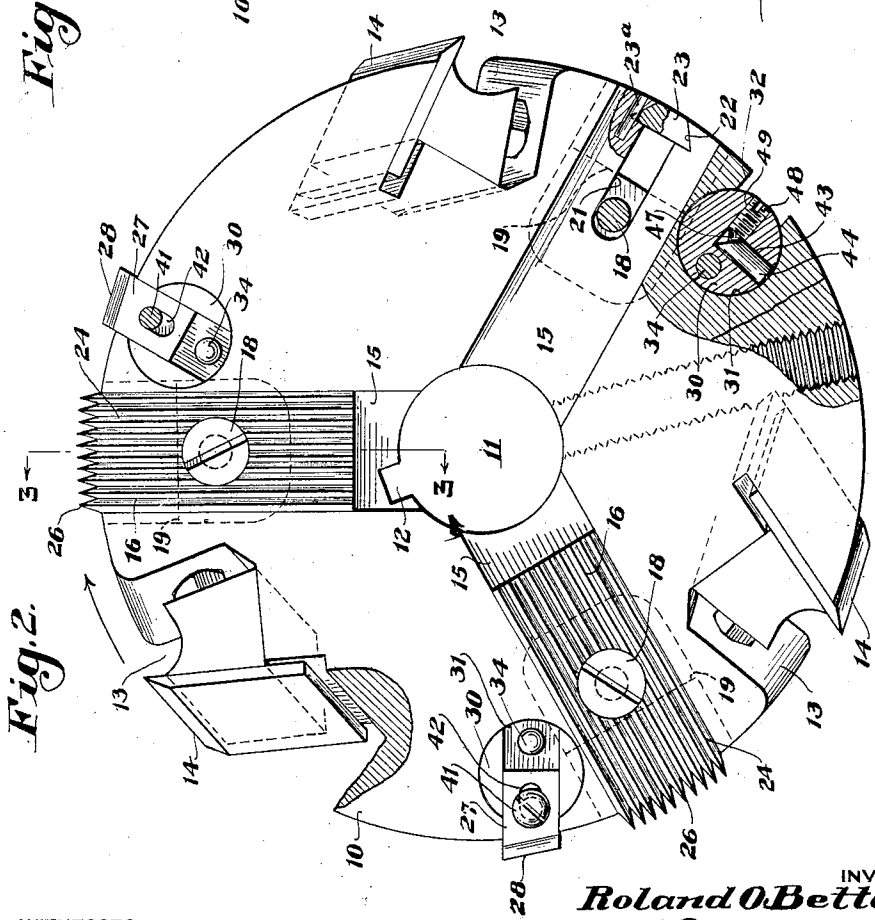


Fig. 2.

WITNESSES

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Patented Apr. 3, 1928. 1,664,806

UNITED STATES PATENT OFFICE.

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CUTTER HEAD FOR WOODWORKING MACHINES.

Application filed November 5, 1924. Serial No. 747,943.

This invention relates to a cutter head of the rotary type, designed primarily for attachment to the arbor of a tenoning machine or the like, the wood to be operated upon being moved transversely of the cutter while the latter rotates.

One of the objects of the invention is to provide a cutter head with a spur cutter of improved construction and secured in a novel manner for cleaning out the shoulders of the tenons, and which may be used on veneered stock without splintering or tearing the veneer.

Another object of the invention is to provide a cutter head of this type with a scoring or grooving bit of improved construction, and having improved means for adjusting the same both longitudinally and radially, and for locking it in its adjusted position.

The invention consists further in various details of construction and combinations of elements, the structure and function of which will be more fully explained in the following detailed description when read in connection with the accompanying drawings, illustrating the invention in its preferred form.

In the drawings:

Figure 1 is a perspective view of the improved cutter head.

Figure 2 is a side elevation thereof.

Figure 3 is a radial section through one of the spur cutters, the plane of the section being indicated at 3—3, Figure 2.

Figure 4 is a radial section through one of the scoring or grooving bits.

Figure 5 is a fragmentary view showing one of the scoring or grooving bits, the view being taken from the side opposite the view point of Figure 2.

Figure 6 is a perspective view of one of the blocks for holding the scoring or grooving bits.

Figure 7 is a perspective view of a locking pin used in connection with the block shown in Figure 6.

The invention is shown in connection with a cylindrical cutter head 10, having a central bore 11 adapted to receive the arbor of a tenoning machine, and having a keyway 12 for securing it thereto. The head 10 is provided, as usual, with a plurality of equally spaced channels 13, in which are secured cutting blades 14 for forming a tenon.

In carrying out my invention, a plurality of radial channels 15 are formed in one face of the head 10 between the channels 13, and each is provided with a spur cutter 16 fitting therein, and adapted to be adjusted radially for cleaning the shoulder formed at the base of the tenon 17. The cutter 16 is held in the channel 15 by a screw 18 having its head countersunk therein, and with its other end in threaded engagement with a rectangular plate or washer 19, seated in a channel 20 formed on the opposite face of the block 10. The screw 18 passes through a radial slot 21 formed in the outer portion of the head 10, and by loosening the screw, the cutter 16 is free to be adjusted outwardly or inwardly. The slot 21 is preferably cut inwardly from the periphery of the head 10, and its outer portion formed with opposed under-cut grooves 22 for receiving a cap plate 23, which is secured in position by a pin 23^a. Both the plate 23 and the pin 23^a have a close driving fit, so as to be permanently assembled in the cutter head.

It is to be particularly noted that the bottom of the channel 15 is slightly inclined with reference to the face of the head 10, so that the cutting spur 16, when seated therein, forms a small angle with the face of the cutter head 10, and with the face of the shoulder which it is designed to clean, as shown in Figure 3. The outer face of the spur 16 is formed with corrugations 24, and its outer or cutting edge is bevelled, as at 25, so as to form sharp pointed cutting teeth 26. The sides of these cutting teeth are substantially equal like an isosceles triangle, and form equal angles with the center line of the tooth, thus giving the same cutting effect as that of a cross cut saw, while in spurs as heretofore used, the front cutting edge has usually been vertical or nearly so, approximating the effect of a rip saw.

The inclination of the spur cutter to the face of the shoulder results in a smoother cut than could be obtained if it were perpendicular to the axis of the arbor, since the spur will cut itself clear at all times without burning or scoring the work. The angle of inclination may be varied within certain limits, but I have obtained the best results with an inclination of approximately one-half inch per foot. The shape of the teeth is also important, since the greater

part of the cutting is across the grain of the wood, and by making them in this shape a smooth cut is assured. In cutting veneered stock, this construction entirely prevents splintering or tearing of the veneer.

Mounted also on the cutter head 10 between the channels 13 are a plurality of scoring or grooving bits 27, each having a cutting edge 28 adapted to cut a groove or chamfer 29, transversely across the face of the tenon 17. Each bit 27 is mounted on a block 30, which slidably fits within a channel 31 formed across the outer portion of the head 10 parallel to its axis. The shape of the channel 31 is not essential, but it is preferred to make it substantially cylindrical with a slot 32 connecting it with the outer surface of the head 10, through which the bit 27 projects. The block 30 is formed with a longitudinal bore 33 at one side of its center, which is in threaded engagement with an adjusting screw 34 mounted in a slot 35 formed in a plate 36, which is secured to the face of the head 10 at one end of the channel 31 by a bolt 39 or the like. The screw 34 is held against longitudinal movement by a collar 37 formed thereon at the inner side of the plate 36 and a polygonal head 38 engaging the outer face of the plate. The screw 34 may be rotated to adjust the block 30 longitudinally, and is held against lateral displacement by the block itself. For securing the bit 27 to the block 30, a second threaded bore 40 is formed therein for receiving a screw 41 which passes through a slot 42 in the bit 27, whereby the latter may be adjusted radially. The bore 40 preferably extends throughout the length of the block 30, so that a bit 27 may be attached to either or both ends of the block.

The block 30 is also provided with a smooth transverse bore 43, which slidably receives a locking pin 44. The latter is formed on its outer end with a rounded face 45 for engagement with the face of the channel 31, and is formed at its inner end with a bevelled face 46, which is engageable by the tapered end 47 of a screw 48 for forcing the pin outwardly to lock the block 30 in its adjusted position. A threaded bore 49 is formed in the block 30 at right angles to the bore 43 for receiving the screw 48, which actuates the locking pin 44.

In most cases where two pieces of wood are fastened together by means of a mortise and tenon joint, the tenon is pressed or driven into the mortise. To facilitate this assembly, it is common practice to bevel the end of the tenon. This bevel is also of great value when the joint is fastened by gluing, since it prevents the glue from being scraped from the walls of the mortise. It also insures a stronger and better job if an intermediate groove, as shown at 29, is cut across the face of the tenon. With the construction above described, the bits may be quickly adjusted both radially and longitudinally to groove or score the tenon at the exact length and depth desired. The bits also cut equally well when used to bevel the end of the tenon, or to form other shapes at this point by means of variously shaped bits.

While I have shown and described the specific details of what is at present regarded as the preferred embodiment of the invention, it is of course obvious that the same may be modified in various ways without sacrificing any of its essential features, and it is my intention, therefore, to include all such modifications within the scope of the appended claims.

What is claimed is:

1. The combination of a rotary cutter head having a longitudinal slot extending from end to end thereof and extending from the peripheral surface of the head inwardly toward its axis, said slot having near said surface undercut faces, a cap plate disposed between said faces and closing the outer side of the slot, means for securing the cap plate in position, a cutting spur mounted for radial adjustment at one end of the head, a screw extending longitudinally through said slot, and means cooperating with said screw for clamping the spur in its adjusted position.

2. The combination of a rotary cutter head having a longitudinal slot extending from end to end thereof and extending from the peripheral surface of the head inwardly toward its axis, said slot having near said surface undercut faces, a cap plate disposed between said faces and closing the outer side of the slot, a pin permanently securing the cap plate in position, a cutting spur mounted for radial adjustment at one end of the head and slightly inclined so that the spur projects at a slight inclination to the plane of rotation, a screw extending longitudinally through said slot, means cooperating with said screw for clamping the spur in its adjusted position, and peripheral cutters extending across the surface of the head whereby to cut a tenon.

3. The combination with a rotary cutter head having parallel radial channels in opposite faces thereof connected by a longitudinal slot, of a cutting spur seated in one of said channels and normally projecting beyond the surface of the head, a plate seated in the other channel, and a clamping screw extending through said slot parallel to the axis of the head and connecting the spur and plate, said plate, screw and spur being adjustable radially as a unit to vary the distance which the spur projects beyond the surface of the head.

4. The combination with a rotary cutter

head having parallel radial channels in opposite faces thereof connected by a longitudinal slot, of a cutting spur seated in one of said channels and normally projecting beyond the surface of the cutter head, the bottom of said channel being slightly inclined so that the spur projects at a slight inclination to the plane of rotation, a plate seated in the other channel, and a clamping screw extending through said slot parallel to the axis of the head and connecting the spur and plate, said plate, screw and spur being adjustable radially as a unit to vary the distance which the spur projects beyond the surface of the head.

5. The combination of a rotary cutter head having parallel radial channels in opposite faces thereof connected by a longitudinal slot, said slot extending from the peripheral surface of the head inwardly and having near said surface under cut faces, a cap plate disposed between said faces to close the outer side of the slot, means for securing the cap plate in position, a cutting spur seated in one of said channels and normally projecting beyond the surface of the head, a plate seated in the other channel, a clamping screw extending through the slot and connecting the spur and plate, said plate, screw and spur being adjustable as a unit to vary the distance which the spur projects beyond the periphery of the head.

6. The combination of a rotary cutter head having parallel radial channels in opposite faces thereof connected by a longitudinal slot, said slot extending from the outer surface of the head inwardly and having near said surfaces under cut faces, a cap plate disposed between said faces to close the outer side of the slot, a pin permanently securing the cap plate in position, a cutting spur seated in one of said channels and normally projecting beyond the outer surface of the head, the bottom of the channel in which said spur is seated being inclined slightly so that the spur projects at a slight inclination to the plane of rotation, a plate seated in the opposite channel, and a clamping screw extending through said slot and connecting the spur and plate, said plate, screw and spur being adjustable as a unit to vary the distance which the spur projects beyond the outer surface of the head.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

ROLAND O. BETTERLEY.