April 14, 1925. 1,533,575

W. H. TOOLE

ADJUSTABLE CUTTER HEAD

Filed Aug. 26, 1924 2 Sheets-Sheet 1

Fig. 1.

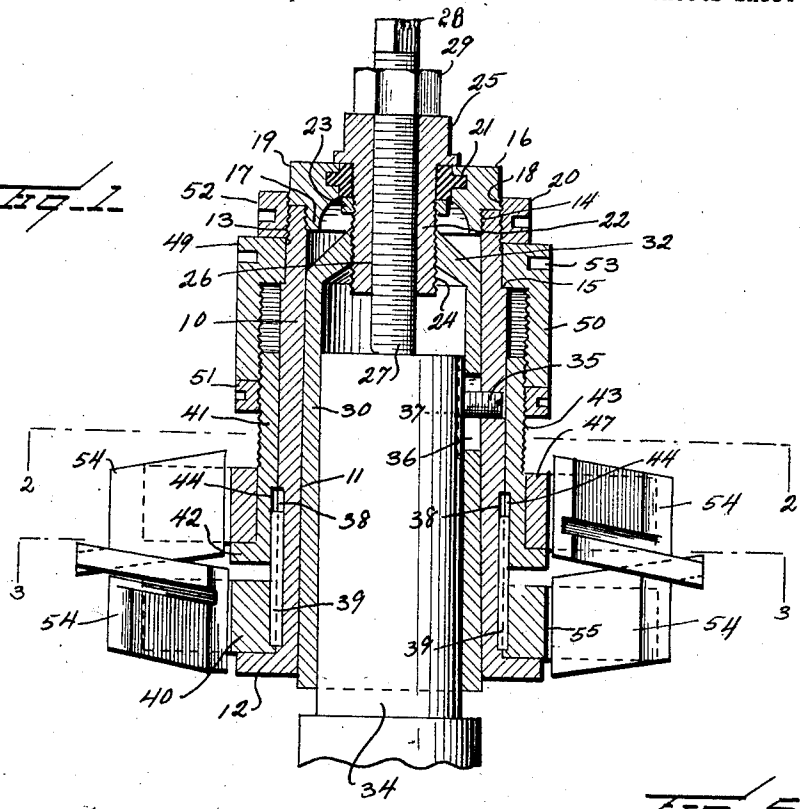


Fig. 7.

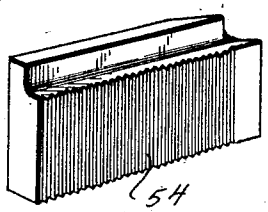


Fig. 5.

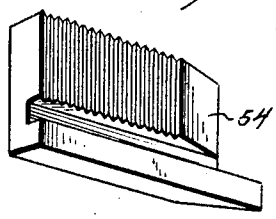


Fig. 6.

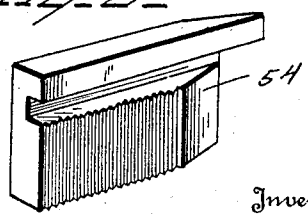
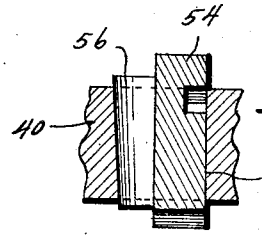


Fig. 4.



Inventor

W. H. Toole

By Watson E. Coleman

Attorney

April 14, 1925.

1,533,575

W. H. TOOLE

ADJUSTABLE CUTTER HEAD

Filed Aug. 26, 1924

2 Sheets-Sheet 2

Fig. 2.

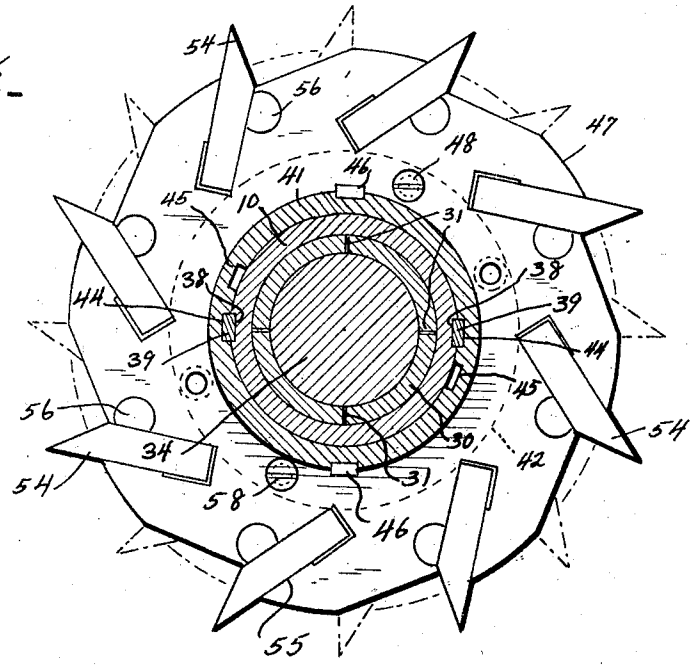
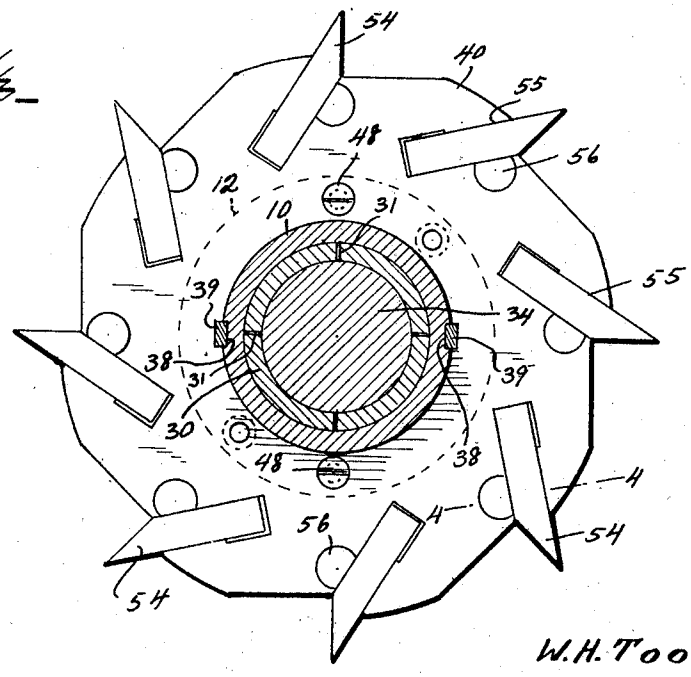


Fig. 3.



Inventor

W. H. Toole

By Watson E. Coleman

Attorney

Patented Apr. 14, 1925. 1,533,575

UNITED STATES PATENT OFFICE.

WILLIAM HUNTER TOOLE, OF LOCKHART, ALABAMA.

ADJUSTABLE CUTTER HEAD.

Application filed August 26, 1924. Serial No. 734,260.

To all whom it may concern:

Be it known that I, WILLIAM HUNTER TOOLE, a citizen of the United States, residing at Lockhart, in the county of Covington and State of Alabama, have invented certain new and useful Improvements in Adjustable Cutter Heads, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to cutter heads, and more particularly to a cutter head for use in woodworking machines in forming tongue and groove boards, such as used for floors, ceilings, partitions, and for similar operations.

An important object of the invention is to provide a device of this character which is readily adjustable to permit changes in the width of the tongue or groove formed and in which in operation the parts are securely locked against movement with relation to one another.

A further object of the invention is to generally improve the structure of the usual type of cutter head, rendering the operation of the same more facile and the production of the same more economical.

A still further object of the invention is to provide a cutter head so constructed that by a simple operation all of the cutters of the head may be placed in alignment with one another, as regards upper and lower cutters of the head, so as to enable rapid grinding thereof.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a vertical sectional view through a cutter head constructed in accordance with my invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is an enlarged detail section showing the wedge pin employed for holding the cutters in position;

Figures 5 and 6 are perspective views of upper and lower cutters for grooving and edging boards removed;

Figure 7 is a perspective of a single tongue forming cutter.

Referring now more particularly to the drawings, the cutter head consists of a main sleeve 10 which is provided interiorly with a tapered bore 11. This sleeve has at its lower end an outstanding horizontal flange 12 and has its upper end exteriorly threaded, as at 13, and interiorly threaded as at 14. Immediately below the upper end of the sleeve, the sleeve is reduced to provide an upwardly directed shoulder 15, the purpose of which will presently appear. Engaged with the upper end of the sleeve is a cap 16 having on its lower surface a depending exteriorly threaded flange 17 engaging the internal screw-threads of the upper end of the sleeve. The lower end of the cap is of the same diameter as the upper end of the sleeve and has a short section of external screw-threads 18 of the same size and pitch as the screw-threads upon the exterior of the upper end of the sleeve. Above these threads, as at 19, the cap is reduced in size so that a member 20 forming a locking ring, the purpose of which will hereinafter appear, may be removed thereover.

The cap 16 is provided with a central bore, the walls of which are rabbeted to provide a bearing, as at 21, in which is rotatably mounted an adjusting screw 22 having a shoulder seating upon the upper surface of the cap. Below the bearing, this adjusting screw is engaged by a collar 23 so that the screw is held against vertical movement with relation to the cap. The lower end of this screw is exteriorly threaded, as indicated at 24, while the upper end thereof is adapted for engagement by a wrench as at 25. This adjusting screw has an interiorly threaded bore 26 within which is mounted a set-screw 27, the upper end of which is squared for engagement by a wrench as indicated at 28, and this screw has mounted thereon a lock nut 29 by means of which it may be held in adjusted position.

The bore 11 of the main sleeve 10 tapers upwardly and has fitted therein a split locking sleeve 30, the exterior face of which is tapered to correspond with the taper of the bore 11. This sleeve is longitudinally split so that it is compressible, as indicated at 31, and the upper end of the sleeve is provided with an interiorly directed flange 32, the inner face of which is screw-threaded for coaction with the adjusting screw 22. By rotating this adjusting screw it will be seen that the tapered sleeve 30 may be shifted longitudinally within the sleeve 11 and by

this shifting will have its interior diameter varied so as to clamp it in adjusting positions upon the end of the cutter shaft 34. The vertical position of the sleeve 10, with relation to the cutter shaft 34, may be determined by adjustment of the set-screw 27 which abuts the upper end of the shaft as shown. Threaded in the sleeve 10 is a set-screw 35 preferably blunt pointed, the inner end of which is directed through a slot 36 formed in the tapered sleeve 30 and engages in a vertical groove or key-way 37 formed in the shaft 34 to assist the tapered clamping sleeve 30 in holding the head against rotation.

The exterior of the sleeve 10, above the flange 12 thereof, is provided with a pair of diametrically opposed keyways 38 in which are mounted keys 39. Seated upon the upper surface of the flange 12 and fitting the exterior of the sleeve 10 is a disk 40 having key-ways receiving the keys 39, this disk being of less thickness and length than the keys. Slidably mounted upon the outer surface of this sleeve 10 is an adjusting sleeve 41, the lower end of which is formed with an outturned flange 42 and the upper end of which is exteriorly threaded as at 43. The lower end of the interior of this sleeve is formed with two pairs of diametrically opposed key-ways 44 and 45 adapted for interchangeable engagement with the keys 39 for a purpose presently to appear. Seated upon the flange 42 of the sleeve 41 and keyed to the sleeve, as at 46, is a second or upper disk 47. To hold the disks 47 and 40 against their respective flanges flush headed screws 48 are employed.

The numeral 49 designates a ring rotatably engaging the sleeve 10 immediately below the threads at the upper end thereof and having its lower face seated upon the upwardly directed shoulder 15 of this sleeve. This sleeve is provided with a depending flange 50, the interior of which is screw-threaded for engagement with the screw-threads shown exterior of the sleeve 41. Upon the sleeve 41, below the lower end of this flange 50, which together with its ring 49 provides an adjusting sleeve, a locking ring 51 is threaded. Above the ring 49 a second locking ring 52 is employed which is of a width greater than the distance between the upper end of the ring and the upper end of the sleeve 10, so that it engages not only the threads at the upper end of the sleeve 10 but also the threads upon the lower end of the cap 16. Each of the locking rings 51, 52, and the ring 49 have formed therein sockets 53 for engagement by the tang of a spanner wrench.

Each of the disks 40 and 47 is adapted for the reception of a plurality of cutters 54, these cutters being of the usual construction which is illustrated in Figures 5, 6 and 7. As a means of retaining these cutters in position in the respective slots 55 of the heads, I preferably employ tapered pins 56 as more clearly shown in Figure 4. The arrangement of the cutters as illustrated is that by means of which the tang of the lower cutter forms the upper side of the groove in tongue and groove cutting, while the lower cutter is dressing the lower edge of the board below the groove, while the upper cutter performs a reverse of this operation. In the normal relative positions of the disks 47 and 40 the knives or cutters are staggered with relation to one another, the knives of one disk being midway between the knives of the other disk. It will be obvious that if the knives be ground in position not only will it require a greater length of time to grind the knives but it will furthermore be seen that there is liability of adjacent cutters being injured during grinding of any one of the cutters. It is for this reason that the two sets of key-ways in the sleeve 41 have been provided. When the sleeve 41 is elevated by the adjusting sleeve or flange 50, this elevation may be continued to a point at which the lower end of the sleeve is disengaged from the upper ends of the keys 39, at which time the sleeve may be rotated through a portion of its circumference to align the key-ways 44 with the keys 39 and the cutter again moved downwardly. This places all of the cutters, upper and lower, in alignment for grinding.

It will be obvious that the structure hereinbefore set forth is capable of a considerable range of change and modification without materially departing from the spirit of my invention, and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In a cutter head for woodworking machines, a main sleeve, means for attaching the main sleeve to a shaft, a pair of cutter disks carried by the main sleeve and having cutter heads, means upon the main sleeve for maintaining the cutter disks stationary with relation to the main sleeve with the cutters thereof in staggered relation, one of said cutter disks being adjustable toward and from the other of said cutter disks upon the main sleeve, and means for shifting the last named cutter disk to align the cutters thereof with the cutters of the other cutter disk.

2. In a cutter head for woodworking machines, a main sleeve, means for attaching the main sleeve to a shaft, a pair of cutter disks carried by the main sleeve and having cutter heads, means upon the main sleeve for maintaining the cutter disks stationary with relation to the main sleeve with the cutters thereof in staggered relation, one of said cutter disks being adjustable toward and

from the other of said cutter disks upon the main sleeve, and means for shifting the last named cutter disk to align the cutters thereof with the cutters of the other cutter disk operable when the adjustable cutter disk is at one limit of its adjustment upon the main sleeve.

3. In a cutter head, a main sleeve having means for attaching the same to a shaft, a cutter disk fixed with relation to the main sleeve and having a plurality of circumferentially spaced cutters, a second cutter disk adjustable upon the main sleeve and having cutters corresponding in number and arrangement to the cutters of the first disk, said second cutter disk being mounted upon a sleeve adjustable upon the outer surface of the main sleeve, the main sleeve having a key coacting with a key-way of the adjustable sleeve and when engaged in said key-way maintaining the cutters of the adjustable disk in staggered relation to the cutters of the stationary disk, said sleeve having a second key-way for coaction with said key and when engaged therewith positioning said sleeve to maintain the cutters of the adjustable disk in alignment with the cutters of the stationary disk.

4. In a cutter head, a main sleeve having means for attaching the same to a shaft, a cutter disk fixed with relation to the main sleeve and having a plurality of circumferentially spaced cutters, a second cutter disk adjustable upon the main sleeve and having cutters corresponding in number and arrangement to the cutters of the first disk, said second cutter disk being mounted upon a sleeve adjustable upon the outer surface of the main sleeve, the main sleeve having a key coacting with a key-way of the adjustable sleeve and when engaged in said key-way maintaining the cutters of the adjustable disk in staggered relation to the cutters of the stationary disk, said sleeve having a second key-way for coaction with said key and when engaged therewith positioning said sleeve to maintain the cutters of the adjustable disk in alignment with the cutters of the stationary disk, and means carried by said main sleeve and having operative engagement with said adjustable sleeve for shifting the adjustable sleeve upon the main sleeve from a point where it is engaged with the key of the main sleeve to a point where it clears said key and is rotatable upon the main sleeve.

5. In a cutter head, a main sleeve having means for attaching the same to a shaft, a cutter disk fixed with relation to the main sleeve and having a plurality of circumferentially spaced cutters, a second cutter disk adjustable upon the main sleeve and having cutters corresponding in number and arrangement to the cutters of the first disk, said second cutter disk being mounted upon a sleeve adjustable upon the outer surface of the main sleeve, the main sleeve having a key coacting with a key-way of the adjustable sleeve and when engaged in said key-way maintaining the cutters of the adjustable disk in staggered relation to the cutters of the stationary disk, said sleeve having a second key-way for coaction with said key and when engaged therewith positioning said sleeve to maintain the cutters of the adjustable disk in alignment with the cutters of the stationary disk, means carried by said main sleeve and having operative engagement with said adjustable sleeve for shifting the adjustable sleeve upon the main sleeve from a point where it is engaged with the key of the main sleeve to a point where it clears said key and is rotatable upon the main sleeve, comprising a collar rotatable upon the main sleeve and having a flange having threaded engagement with said adjustable sleeve, and means for locking said flange and adjustable sleeve against relative movement.

6. In a cutter head, a main sleeve having means for attaching the same to a shaft, a cutter disk fixed with relation to the main sleeve and having a plurality of circumferentially spaced cutters, a second cutter disk adjustable upon the main sleeve and having cutters corresponding in number and arrangement to the cutters of the first disk, said second cutter disk being mounted upon a sleeve adjustable upon the outer surface of the main sleeve, the main sleeve having a key coacting with a key-way of the adjustable sleeve and when engaged in said key-way maintaining the cutters of the adjustable disk in staggered relation to the cutters of the stationary disk, said sleeve having a second key-way for coaction with said key and when engaged therewith positioning said sleeve to maintain the cutters of the adjustable disk in alignment with the cutters of the stationary disk, means carried by said main sleeve and having operative engagement with said adjustable sleeve for shifting the adjustable sleeve upon the main sleeve from a point where it is engaged with the key of the main sleeve to a point where it clears said key and is rotatable upon the main sleeve, comprising a collar rotatable upon the main sleeve and having a flange having threaded engagement with said adjustable sleeve, means for locking said flange and adjustable sleeve against relative movement, and means for locking said collar and main sleeve against relative movement.

7. In a cutter for woodworking machines, a main sleeve adapted to be secured to a shaft, a pair of cutter disks carried by the sleeve and having cutters, one of said disks being stationary and the other longitudinally adjustable upon the main sleeve, a

pair of keys carried by the main sleeve, a connection between the adjustable cutter and the main sleeve having a keyway and means for locking the cutter against longitudinal shifting with the keyway in engagement with either of the keys.

8. In a cutter for woodworking machines, a main sleeve adapted to be secured to a shaft, a pair of cutter disks carried by the sleeve and having cutters, one of said disks being stationary and the other longitudinally adjustable upon the main sleeve, a pair of keys carried by the main sleeve, a connection between the adjustable cutter and the main sleeve having a keyway, means for locking the cutter against longitudinal shifting with the keyway in engagement with either of the keys including a member rotatable upon the main sleeve and having threaded engagement with the connection of the adjustable cutter disk to the main sleeve and a locking ring carried by said connection for engagement with said member.

9. In a cutter for woodworking machines, a main sleeve adapted to be secured to a shaft, a pair of cutter disks carried by the sleeve and having cutters, one of said disks being stationary and the other longitudinally adjustable upon the main sleeve, a pair of keys carried by the main sleeve, a connection between the adjustable cutter and the main sleeve having a keyway, means for locking the cutter against longitudinal shifting with the keyway in engagement with either of the keys including a member rotatable upon the main sleeve and having threaded engagement with the connection of the adjustable cutter disk to the main sleeve, a locking ring carried by said connection for engagement with said member, said rotatable member and adjustable cutter disk and its connection with the main sleeve being bodily removable from the main sleeve as a unit and means for locking such unit in position against removal from the main sleeve.

In testimony whereof I hereunto affix my signature.

WILLIAM HUNTER TOOLE.