J. H. COPPING.

CUTTER HEAD.

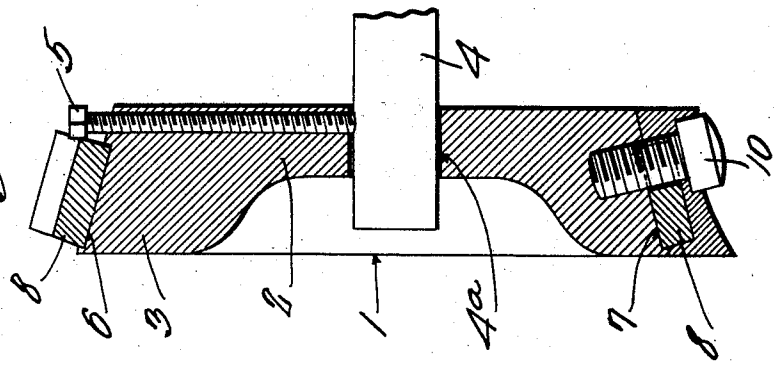
APPLICATION FILED MAR. 25, 1912.

1,047,752.

Patented Dec. 17, 1912.

2 SHEETS—SHEET 1.

Fig. 2.



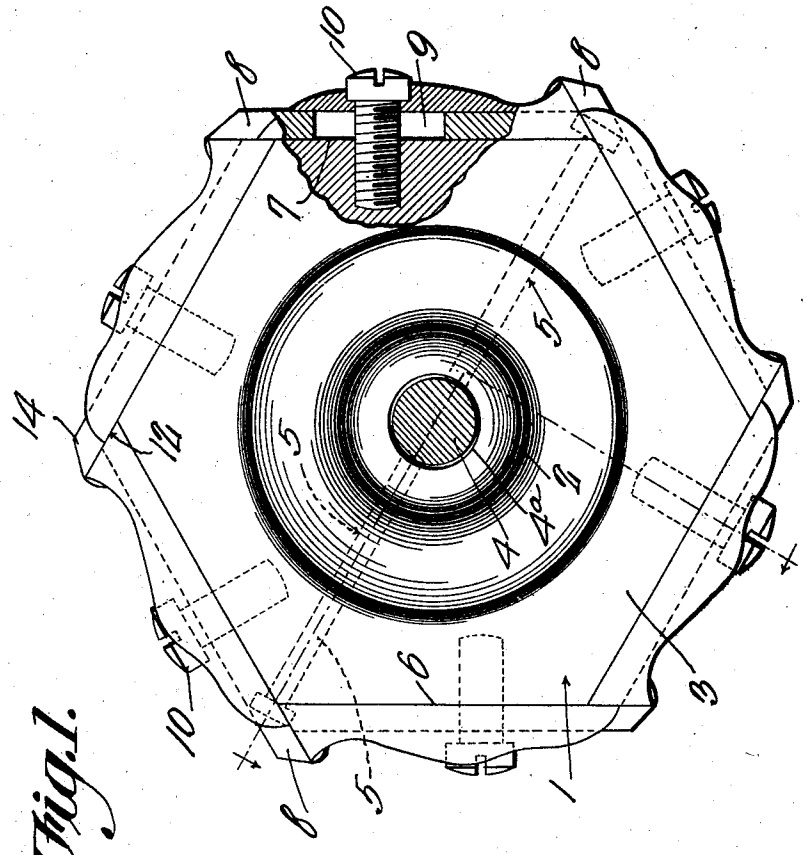


Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

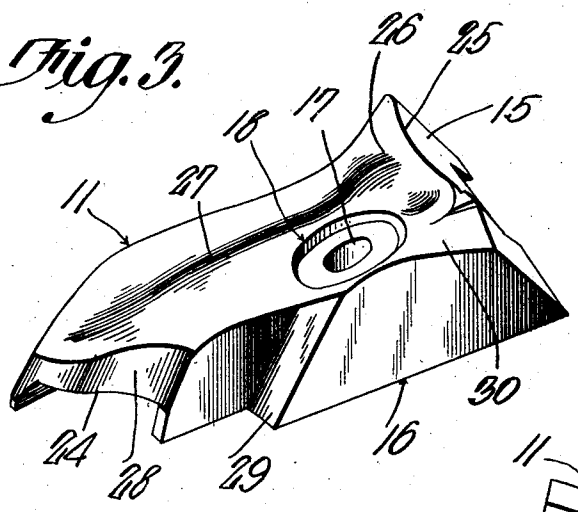


Fig. 4.

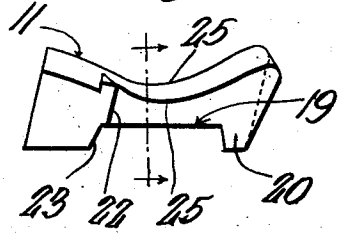


Fig. 5.

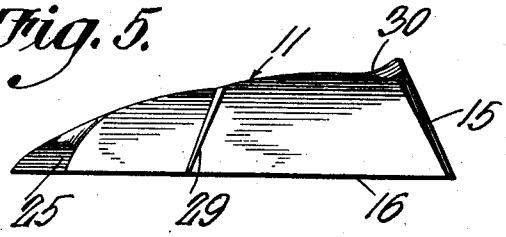


Fig. 6.

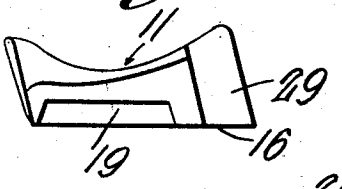
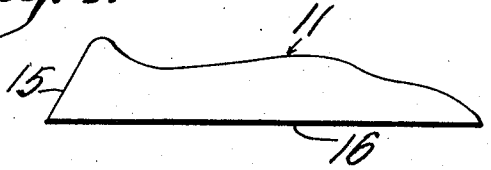


Fig. 7.



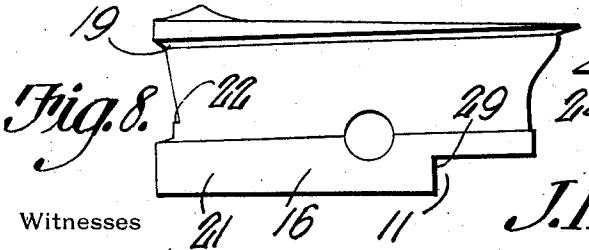


Fig. 8.

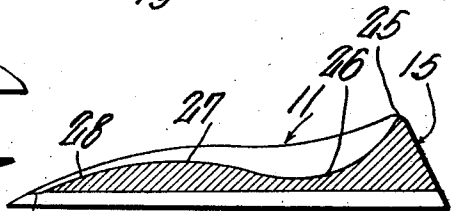


Fig. 9.

Witnesses

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UNITED STATES PATENT OFFICE.

JAMES HENRY COPPING, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

CUTTER-HEAD.

1,047,752. Specification of Letters Patent. Patented Dec. 17, 1912.

Application filed March 25, 1912. Serial No. 686,156.

To all whom it may concern:

Be it known that I, JAMES H. COPPING, a subject of the King of England, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Cutter-Head, of which the following is a specification.

The present invention aims to provide a cutter head for a wood-working machine, so constructed that the tools which are carried by the periphery of the head, will have a draw cut upon the work, owing to the fact that the periphery of the head is acutely disposed with respect to the axis of rotation of the head.

A further object of the invention is to provide a cutter head for a wood-working machine, the center of gravity of which is disposed relatively near to the periphery of the head, and relatively near to the tools which the head carries, thereby to facilitate the rotation of the head with a slack driving belt, thus rendering the tools effective due to the inertia of the head.

A further object of the invention is to provide a cutter head for a wood-working machine in which a single element constitutes at once, a means for holding the tools upon the head, and a chip-breaker for the tools.

The invention aims further to provide, as an article of manufacture, a novel form of block adapted to serve at once as a means for holding tools upon the periphery of the cutter head, and a chip-breaker for the tools.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings,—Figure 1 shows the invention in plan; Fig. 2 shows the same in transverse section; Fig. 3 is a perspective of the combined tool-holding block and chip-breaker; Fig. 4 is an elevation showing one end of the block; Fig. 5 is an elevation showing one side of the block; Fig. 6 is an elevation showing the opposite end of the block from that depicted in Fig. 4; Fig. 7 is an elevation showing the opposite side of the block from that shown in Fig. 5; Fig. 8 is a bottom plan of the block; and Fig. 9 is a longitudinal section of the block.

In carrying out the invention, there is provided a head 1, a pair of such heads being employed, at times, as is well understood in the art, when door rails are to be tenoned, and in like operations. The head 1 is of polygonal peripheral contour, and in the present instance is shown in hexagonal form, although this detail may be departed from when considered desirable. The head 1 consists of a relatively thin central web 2, and a thickened, heavy, peripheral rib 3.

Owing to the foregoing construction, the center of gravity of the head 1 is located relatively near to the periphery of the head, the head being relatively heavy adjacent its periphery, and relatively light adjacent its center. The device, therefore may be rotated with slack beltage, thereby minimizing the wear and tear upon the machine.

The driving spindle 4 passes through the center of the web 2, the head 1 being held upon the spindle 4 by means of diametrically opposite set screws 5, one of which is shown in Fig. 2, both of which are indicated in dotted lines in Fig. 1.

Owing to the fact that the head 1 is supported by diametrically opposite set screws 5, wear upon the spindle bore 4^a is reduced to a minimum. Furthermore, the spindle bore 4^a becomes more or less enlarged in diameter, after a protracted use, and the spindle 4 is crowded to one side of the bore 4^a, when but one set screw is employed, the head 1, as a consequence, being eccentrically positioned with respect to the axis of rotation of the spindle 4.

The periphery 6 of the head 1 is disposed at an acute angle to the axis of the spindle 4, each of the faces which go to make up the peripheral area 6 of the head 1 being provided with a longitudinally extended tool-receiving seat 7, in which the tool 8 is held, in a manner to be described hereinafter.

No specific form of tool is described, since the device is adapted to be employed with tools of any sort, for tenoning and gaining sash and door elements, for raising panels, for rabbeting, for running stock moldings, and for all other wood working operations wherein a rotary cutter, of single or of double form, is employed.

By reason of the fact that the periphery

6 of the head 1 is acutely disposed with respect to the axis of rotation of the driving spindle 4, the working edges of the tools 8 are given a draw cut upon the material. The cutting edge of the tool 8 does not engage the work with a chipping or scraping action, as is the case when the entire cutting edge of the tool is thrust at once into the work. One side of the cutting edge of the tool 8 is out of the work before the other side of the same cutting edge has completed the cutting operation. The head 1 may, therefore, be rotated at a high rate of speed without overheating the tools 8 and drawing them blue.

Passing now to a detailed description of the means whereby the tool 8 is held upon the periphery of the head 1, it will be noted, referring to Fig. 1, that the tool is equipped with a longitudinal slot 9, through which passes a set screw 10, the set screw engaging a tool-holding block and chip breaker, indicated generally by the numeral 11. As indicated at 12 each tool 8 abuts terminally against the next adjoining tool, such adjoining tool projecting beyond its fellow, as indicated at 14.

Referring to Figs. 3 and 5 for a clearer understanding of the combined tool-holding block and chip breaker, it will be observed that one end face 15 is inclined at an acute angle to the base 16 of the block, so as to fit in the acute angle defined by the portion 14 of one tool, and the body portion of the abutting tool. An opening 17 extends through the block 11 for the reception of the set screw 10, there being a recess 18 about the opening 17, which recess is adapted to receive the head of the set screw.

In the base 16 of the block 11 there is a tool-receiving seat 19 which coöperates with the seat 7 in the periphery of the head 1, in retaining the tool 8. The seat 19 serves to define at one side of the block, a relatively thin, tapered rib 20, and to define at the other side of the block a relatively thick rib 21. The tool-receiving seat 19 is disposed acutely with respect to the longer axis of the block 1, and consequently the end face 15 is shouldered as shown at 22, the shoulder 22 lying between the walls 23 of the seat 19, as shown in Fig. 4. The cutting end of the tool 8 projects from the end 24 of the seat 19 in one block, and extends across the end face 15 of the next adjoining block, the tool being laterally engaged by the shoulder 22 of that block against which the portion 14 of the tool abuts, as shown in Fig. 1.

Adjacent the end face 15, the block 11 is brought to an edge, as shown at 25, thereby to define a chip breaker. Immediately in front of the chip-breaking edge 25 of the block, a depression 26 is formed, which aids in freeing the chip. The chip-breaking edge 25 is concaved transversely of the block, and the depression 26 is concaved both transversely of the block and longitudinally thereof, the block bulging outwardly in advance of the depression 26, as indicated at 27, and then sloping as indicated at 28, to a thinned edged, located adjacent the end 24 of the recess 19. One side of the block 11 is shouldered diagonally, as indicated at 29, thereby widening the block as indicated at 30, and strengthening the block for the passage of a set screw 10.

The block 11 engages the tool 8 and prevents a vibration and springing in the tool. Should the set screw 10 work loose, the tool 8 will not be thrown off the cutter head 1 by centrifugal force, the tool merely clattering between the head 1 and the block 11, and serving to attract the attention of the operator to the loosened condition of the tool.

In devices of this type, the peripheries of which are provided with a plurality of blades, considerable difficulty has been experienced heretofore by reason of the fact that much space has been taken up by the chip-breakers, with a consequent shortening of the tool, the connection between the tool and the head 1 being rendered correspondingly insecure. In the present invention the chip-breaker, as such, occupies no space, the chip-breaker being a part of the block whereby the tool is held upon the periphery of the head.

Having thus described the invention, what is claimed is:—

In a device of the class described, a cutter head, the peripheral faces of which are inclined transversely of the head and are disposed at an acute angle to the axis of the head; blocks applied to the peripheral faces of the head, each block having a seat in its under face, disposed at an acute angle to the plane of the head, one end face of each block having a shoulder located between the walls of the seat; and tools in the seats, each tool projecting beyond the block in which it is held, and the projecting end of the tool being engaged laterally by the shoulder of an adjoining block.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES HENRY COPPING.

Witnesses:
ANNIE M. COPPING,
ELIAS RIVE.