(No Model.)

A. K. CAVERLY.

MACHINE FOR ROUNDING BENT HANDLES.

No. 303,116. Patented Aug. 5, 1884.

Fig. 2.

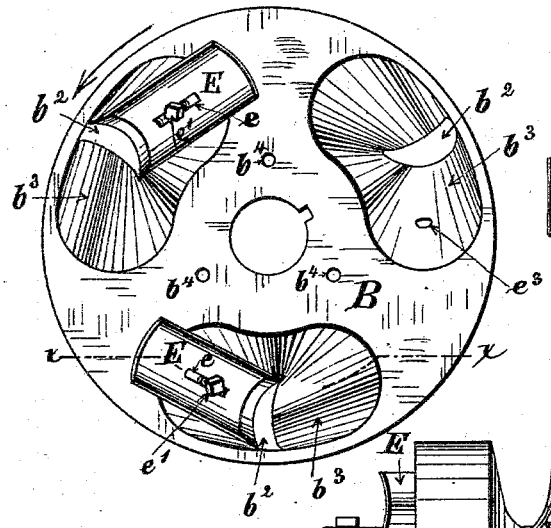


Fig. 3.

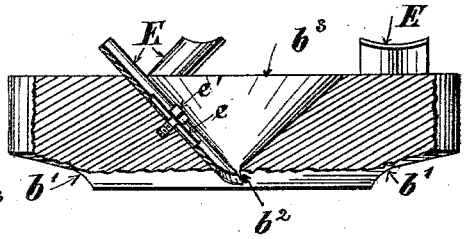


Fig. 1.

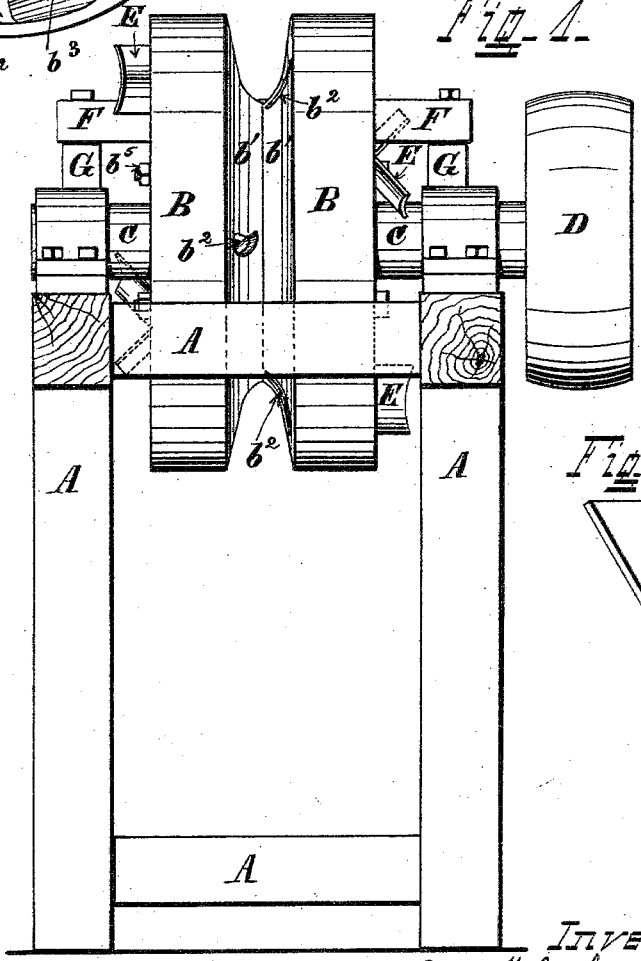


Fig. 4.

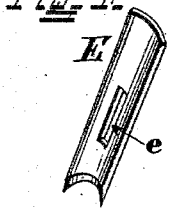
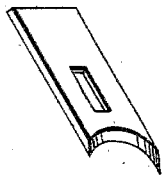


Fig. 5.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR ROUNDING BENT HANDLES.

SPECIFICATION forming part of Letters Patent No. 303,116, dated August 5, 1884.

Application filed November 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, AMOS K. CAVERLY, of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Machines for Rounding Bent Handles and other Wood-Work, of which the following is a specification.

Heretofore the bent portions of handles used on cultivators and for other purposes have been rounded or ovaled to fit the hands of the operator by an ordinary draw-knife, in some instances by a lathe with a set-knife and in others by various styles of rotary cutters, and in either case smoothed or finished by running them over a sand-belt. The ovaling or rounding of wood-work for other purposes has been accomplished by similar means and finished or smoothed in like manner.

My invention relates to machines for forming such round or oval on bent-wood handles and other wood-work, whether bent or straight; and it consists in a cylindrical cutter-head mounted on an ordinary frame, and revolving vertically by suitable gearing, constructed, preferably, of two cylinders or disks bolted together, having in the center of its periphery a groove the shape and size of the curve or oval on the dressed handle, and the cutter-knives adjusted from both sides of the cutter-head into the groove, and in the various other combinations and details of construction hereinafter described and claimed.

For convenience I will illustrate and describe my invention with reference to the rounding of bent handles—such, for instance, as are used on plows and cultivators—although it is effective with many classes of wood-work where a rounded or ovaled edge is desired.

In the drawings, Figure I is a rear elevation of a machine embodying my invention, and showing particularly the construction of the cutter-head and its mounting on the frame-work. Fig. II is a side view of the cutter-head, showing the mode of adjustment of the cutters thereto. Fig. III is an edge view of one-half of a cutter-head, with parts cut away at *x x* in Fig. II to show the adjustment of the knives; and Figs. IV and V are detail views of cutter-knives.

A is a bench or frame such as is ordinarily used with emery-wheels or like machines, upon which is mounted a cutter-head, B, upon a spindle or shaft, C, rotated by a pulley, D, actuated by a belt or other suitable connection with the main driving-shaft. The front end of the machine is provided with a block, F, securely bolted on standards G, upon which the material is rested while being run through the machine.

The cutter-head B is of cylindrical form, made of steel, iron, or other suitable material, constructed, preferably, of two cylindrical pieces or disks, each having such a curved or concaved cut, b', on its inner face, extending from beyond its diameter to its periphery, that when they are placed with their curved faces together the curves or concaves in the disks will form a groove in the head the size and shape of the dressed handle. When the cutter-head is constructed in two pieces, the latter are securely fastened together by bolts passing through bolt-holes b^4 in each and nuts b^5, or otherwise prevented from having independent motion. Each of the disks forming the cutter-head has one or more openings or ditches, flaring at the top on the outer face thereof, decreasing in width in their inward progress, and terminating at the bottom in narrow crescent-shaped openings b^2 in the curve on the inner face of the disk, the metal being concaved and sharply inclined at one end of the recesses, as at b^3, to permit the ready shedding of the chips from the cutter, and convexed and inclined in like manner at the opposite end to form beds for the concaved knives.

The cutter-knives E are thin plates of steel, beveled at their cutting ends like ordinary plane blades or bits, concaved on their cutting-faces to fit a convexed bed at one end of the openings in the cutter-head, adjustable thereon to regulate the depth of their cutting action by set-screws e', working through a slot, *e*, in the knives, and secured by said set-screw to the head. If desired, the knives, instead of being concaved on their cutting-faces, may be made flat; but in such case the beds for such knives in the openings in each half of the head must also present a flat surface, and the machine with such shaped cutters will work as effectively as with any other. However, for reasons hereinafter stated, the curved knife is much more desirable, and is the one I prefer.

The number and mode of adjustment of the

cutter-knives used may be varied as the size of the head or the character of the wood to be shaped may render expedient. I have found that, for general purposes, six knives—three in each half of the head, the knives thereof on one side alternating in their appearance on the concave with those on the other—is a very satisfactory and efficient arrangement. The bent handle is held by the operator on the rest-block, and guided by him into the groove in the head, which, revolving rapidly—say two thousand revolutions per minute—by the action of its cutters, shapes the side of the handle exposed to the cutters the form of said groove. The handle is then turned over and guided into the groove in like manner, shaping the other side and completing the rounding of the handle. With some classes of work it is desired to round the handles on one side and oval them on the other, or otherwise vary the shape of the different sides, in which case several heads are employed with grooves and knives of the shape to give to the various sides of the handle the shapes required. Thus, if a handle is desired oval on top and round underneath, the top of the bent wood is run through a machine with about the shape of groove shown in the drawings, to form the oval, and then turned over and run through a semicircular grooved head to form the rounded surface on the under side. The knives are adjusted to the disks of the cutter-head upon sharply-inclined beds formed in one end of the openings in the disk, thus presenting the cutting-edges of the knives diagonally to the plane of the curved portions of the disks, as shown in Fig. III, similar to the manner in which plane-bits are secured to the plane-frame, the incline on the other side forming a channel for the discharge of the chips made by the cutters, and are adjustable back and forth within the disks by set-screws working in slots in the knives. By this longitudinal adjustment the depth of the cutting action of the knives may be regulated. The openings, where the cutters enter the curve on the disks, being narrow, the metal surrounding such openings resists the progress of the cutters beyond the distance to which the cutters extend beyond the curve, and by increasing or diminishing this distance the cut may be made deeper or shallower and the character of the work done varied. When the knives are projected to a considerable distance into the curve, the chips are larger, and the work consequently not so smooth as when the distance which they extend beyond the curve is made shorter; and when they are but slightly projected the chips are very fine and the work very smooth and nice. These adjustments may be made to suit the character of wood being shaped or the character of work required; but with proper care, with all qualities of wood, the arrangement of the knives may be made so that the handles shaped will be sufficiently smooth to go directly to the paint-shop without further smoothing or finishing.

The knife which I prefer is that shown in Fig. IV. It is constructed of a thin plate of steel beveled like a chisel-blade on its cutting end, curved to such an extent that when the blade is inclined with the beveled edge on a flat surface the bevel will touch the flat surface at every point in its plane. The advantage of this feature is that the blades, when dull, may be sharpened on a flat stone, whereas if flat knives like that shown in Fig. V are used a rounded stone the shape of the curve on the knife must be used.

A roller acting by a yielding pressure may be hung above the top of the cutter-head where the work to be shaped is of considerable length, to hold the wood down to the action of the cutters and form an additional guide therefor; but in the shaping of handles I have not found such a roller necessary.

I claim—

1. A cutter-head consisting of a cylinder with a groove in the center of its periphery and recesses from either side, terminating in narrow openings on such groove, for the adjustment of the cutter-knives.

2. A cutter-head constructed of two cylindrical disks, each with such a concave on its inner face, extending from beyond the diameter to the periphery, that when secured with their curved faces together the concaves form a groove on the periphery of the head corresponding to the shape and size of the dressed work, with one or more recesses extending from the outer face of each disk, diminishing in width as they progress, and terminating in a narrow opening in the curve, forming beds for the cutters and spouts for the discharge of chips, with knives secured in the openings.

3. A cutter-head constructed of two cylindrical disks, each with such a concave on its inner face, extending from beyond the diameeter to the periphery, that when secured with their curved faces together the concaves form a groove on the periphery of the head corresponding to the shape and size of the dressed work, with one or more recesses extending from the outer face of each disk, diminishing in width as they progress, terminating in a narrow opening in the curve, forming beds for the cutters and spouts for the discharge of chips, with slotted knives secured in the openings and adjustable longitudinally therein by set-screws.

4. The combination of the frame, the cutter-head with groove in its periphery and one or more openings from each side, terminating in a narrow slit on the groove, one or more knives so curved that the bevel on their cutting ends presents a flat surface, and gearing by which the head is actuated.

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Witnesses:
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H. D. BLAKEMORE.