

(No Model.)

2 Sheets—Sheet 1.

F. F. WICHARD.

WOOD WORKING MACHINE FOR SHAPING CLOSET SEATS.

No. 473,276.

Patented Apr. 19, 1892.

Fig. 1

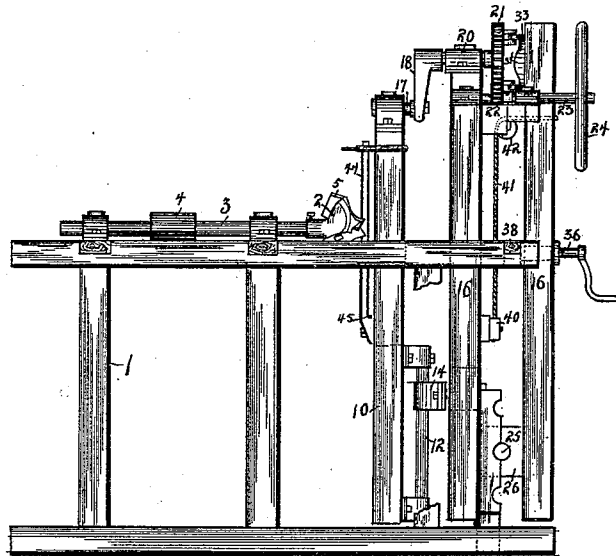


Fig. 2

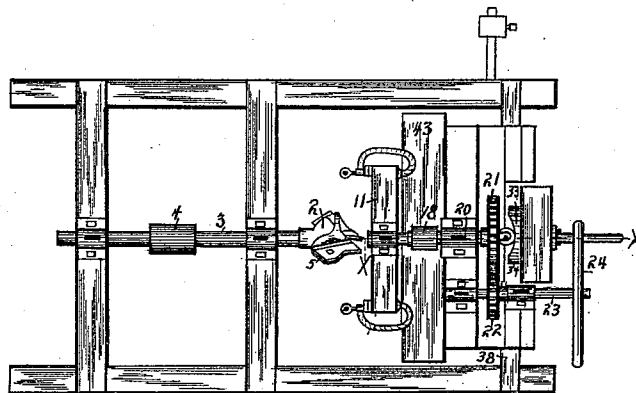


Fig. 3

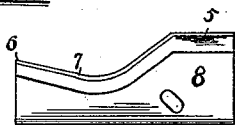


Fig. 4

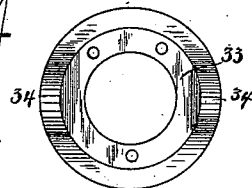


Fig. 5

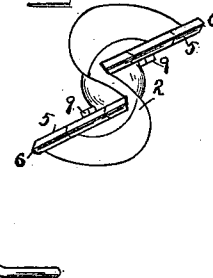


Fig. 6

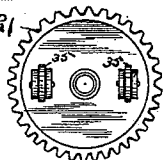
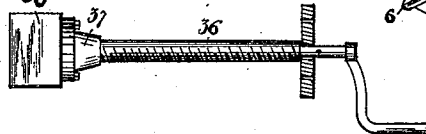


Fig. 7



Witnesses:
A. A. Eick.
E. E. Longan.

Frank F. Wichard, Inventor
By his Attorneys Higdon & Higdon

(No Model.)

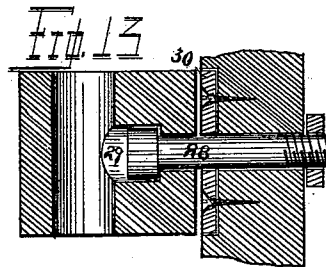
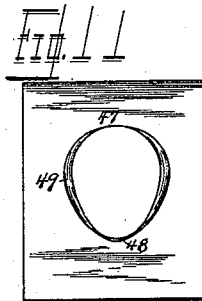
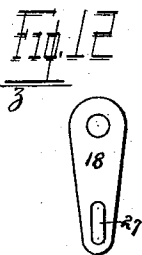
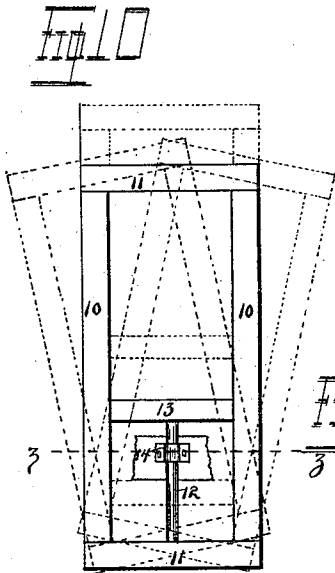
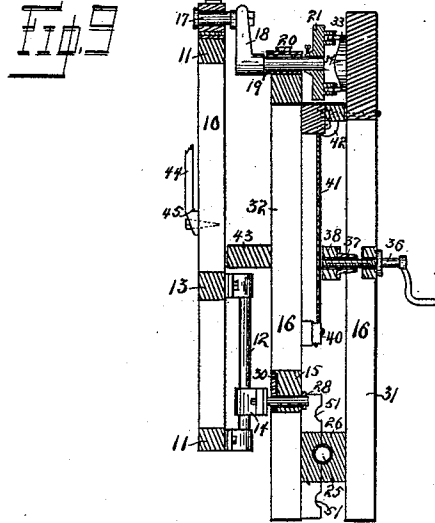
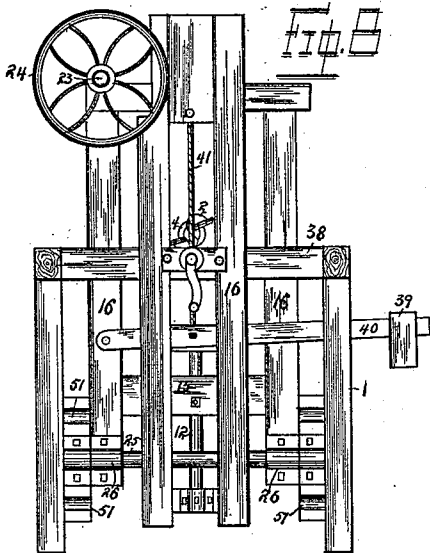
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UNITED STATES PATENT OFFICE.

FRANK F. WICHARD, OF ST. LOUIS, MISSOURI.

WOOD-WORKING MACHINE FOR SHAPING CLOSET-SEATS.

SPECIFICATION forming part of Letters Patent No. 473,276, dated April 19, 1892.

Application filed September 17, 1891. Serial No. 406,046. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. WICHARD, of the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Wood-Working Machines for Shaping Closet-Seats, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved wood-working machine for shaping closet-seats; and it consists in the devices and novel combination and arrangement of devices hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention, looking toward the under side of Fig. 2. Fig. 2 is a plan view of same. Fig. 3 is a detail view of one of the knives used in the machine. Fig. 4 is a front elevation of a cam enlarged. Fig. 5 is an end view of an improved cutter-head used in the machine, looking toward the same from the right hand of Fig. 2, the view being an enlarged detail view. Fig. 6 is a side elevation of the gear-wheel used in the machine. Fig. 7 is a detail plan view of a cross-bar of the machine, carrying an adjusting-screw and hand-crank. Fig. 8 is an end elevation of the machine, showing the end thereof at the right hand of Figs. 1 and 2. Fig. 9 is a sectional elevation of the blank-feeding mechanism, the section being taken on line *z z* of Fig. 2. Fig. 10 is a side elevation of a blank-holding frame detached, showing the different movements thereof in dotted lines. Fig. 11 is a face view of a finished closet-seat as turned out by my improved machine. Fig. 12 is a detail view showing the face of a crank used in the machine. Fig. 13 is a detail section through a swiveling bearing and contiguous parts used in the machine, the section being taken on the line *z z* of Fig. 10.

My improved machine is adapted to hold blanks for closet-seats and other similar wooden articles, cut in them an oval aperture that is wider at one end than at the other, and shape the edges of said oval aperture to finished form while so held.

1 indicates the frame of the machine, which may be constructed of any suitable material,

such as wood, as here shown, or of iron, the same having horizontal bars to rest upon the floor and upright bars to support the upper portions of the machine.

2 indicates a revoluble cutter-head mounted upon the inner projecting ends of a shaft 3, the latter having suitable bearings upon or in the frame-work, which will permit it to revolve, yet hold it fixed against longitudinal movement.

4 indicates a belt-pulley mounted on shaft 3 for imparting motion to said shaft.

It will thus be observed that the cutter-head is what may be termed a "stationary revolving cutter-head." It is provided with knives 5, preferably of the form shown in Fig. 3, wherein there is shown a knife having one edge ground for a cutting-edge, and provided with a cutting-edge at one end, thereby forming a projecting angular cutting-point 6, the purpose of which will appear hereinafter. The knife is also provided with a concave cutting-edge, which, together with the angular point 6, completes the embodiment of a knife having a terminal cutting-point, which is adapted to enter the wood and penetrate completely through the blank, and what I term a "finishing-edge" 7, which is located intermediate of the ends of the knife.

The knife 5 is preferably provided with what is commonly known as a "chip-breaker" 8, the edge of which follows the contour of the cutting-edges of said knife. The knife and the chip-breaker are secured to the cutter-head by means of the usual bolt or set-screw 9, which need not be further referred to.

The blank-feeding mechanism is provided with a blank-holding frame 10, which is so mounted as to move in an irregular path up, down, laterally, and to and from the knives carried by the cutter-head. The frame 10 is preferably of rectangular form, as shown, made up of a pair of vertical bars connected by a pair of cross-bars 11. (See Figs. 9 and 10.) At the lower end of frame 10 there is a short vertical shaft 12, fixed in suitable bearings, so as to move with said frame, one end of said shaft being fixed in a bearing located on the lower one of the cross-bars 11 and its upper end being fixed in a bearing located upon a cross-bar 13, which is similar to cross-

bars 11. The shaft 12 is mounted to slide in a swiveling bearing 14, carried by a cross-bar 15 of an oscillating frame 16, which will be referred to farther on. The upper end of frame 10 is supported upon and follows the pin 17 of a crank 18, which latter is mounted upon a shaft 19. The shaft 19 is mounted in suitable bearings 20, carried by the upper end of the oscillating frame 16, so as to extend in the same direction in which the cutter-head shaft is located, and said shaft 19 is adapted to be revolved or rocked in either direction, as the judgment of the operator may determine.

21 indicates a gear-wheel mounted upon the end of the shaft 19, that is opposite the end on which the crank 18 is mounted, and 22 indicates a pinion which is mounted on the shaft 23 and meshes with said gear-wheel 21. The shaft 23 is mounted in suitable bearings, so that one end will project outwardly beyond the oscillating frame 16, and a hand-wheel 24 is mounted upon the projecting end of said shaft. The lower end of the oscillating frame 16 is suitably mounted upon a shaft 25, so as to permit the upper end of said frame to move nearer to or farther from the cutter-head, and said shaft is mounted in bearings, such as 26, carried by some stationary portion of the frame. The throw of the crank 18 is adjustable by reason of its having a slot 27, through which the crank-pin 17 passes and may be adjusted therein by the usual clamping-nut. The swiveling bearing 14 is pivotally attached to the cross-bar 15 by means of a headed bolt 28, the head whereof is located in a socket 29, formed in said bearing, and which bolt extends through said bearing in a direction at right angles to the passage therethrough of the shaft 12, through a bearing-plate 30 of metal and the bar 15, and is provided with a suitable nut or other fastening, (see Fig. 13;) but it is evident, however, that other details of a swiveling bearing may be used here and perform the same function. The oscillating frame 16 is made in two parts—an outer part or leaf 31 and an inner leaf 32—which are pivotally connected at their lower ends by means of the shaft 25, the outer leaf 31 having bearings on said shaft which are located intermediate of the bearings of the inner leaf. (See Fig. 8.) Although these two leaves are pivotally connected at their lower ends, yet their upper ends are adapted to be moved toward and from each other during operation of the machine, such movement being accomplished automatically by the action of a circular cam 33, which is securely attached to the inner side of the upper end of the leaf 31. This cam has oppositely-located projections 34, which are adapted to be engaged by small rollers 35, which are diametrically located and fixed upon the outer surface of the gear-wheel 21. Said rollers are of course free to revolve, although being so fixed or located.

36 indicates a screw having a crank or han-

dle of some kind upon its outer end, which passes loosely through a cross-bar of the outer leaf 31, engages same so as to move said leaf, and consequently the entire blank-feeding mechanism, toward and from the cutter-head, and engages a threaded nut 37, carried by an upper cross-bar 38 for the frame, which cross-bar is stationary. The outer and inner leaves of the oscillating frame are at all times urged toward each other by suitable force, such as a weight or a spring, so that the cam 33 will be normally engaged by the rollers 35, and yieldingly held in such engagement. I have used for this purpose a weight 39, adjustably mounted upon a horizontal lever 40, which latter I have pivoted at its inner end to one of the vertical bars of the inner leaf 32, and attached a cord, rope, or chain 41 to said lever intermediate of its ends, and have extended said cord upwardly over the roller 42, which latter is mounted upon or attached to the upper portion of the inner leaf 32. After passing said cord or rope over said roller 42 I have extended it outwardly and attached its upper end to the outer leaf 31, this arrangement of which I have found to answer the purpose just above mentioned.

43 indicates a transverse bar, which is secured to the inner side of the leaf 32 so that its ends will loosely engage and slide between the upper longitudinal bar of the frame of the machine. The purpose for which it is constructed is to guide and steady said leaf in its movement toward and from the cutter-head, and thereby prevent vibration of the said leaf, which might otherwise occur.

The operation is as follows: When it is desired to shape a closet-seat to the form shown in Fig. 11, (which is the finished form,) a blank of suitable size is inserted between the clamps 44 and the inner face of the blank-holding frame 10, so that the lower edge of said blank will abut against and be supported by a shoulder 45, formed on said clamps, (see Figs. 1 and 9,) which will support said blank at a predetermined height with relation to the cutter-head 2. Then the blank is securely fastened to said frame 10 in any desired manner—such, for instance, as by wood-screws or by an ordinary screw-clamp. At this stage of operation the crank 18 should be down, as seen in Fig. 1, in which the parts are shown in proper position to begin the shaping of a blank. Although it is not necessary that a hole should be sawed out of the blank to leave an aperture similar to the contour of the finished aperture, yet such may be done before the shaping operation is begun. However, I will proceed to describe the operation of finishing a closet-seat without first sawing out the center of the blank. The blank being clamped to the frame 10, as before described, and said frame being at the limit of its downward movement, and the cutter-head revolving at about a speed of two thousand five hundred revolutions per minute, the screw 36 is turned

in the proper direction to cause the entire blank-feeding mechanism (including the leaves 31 and 32) to move toward said cutter-head, which operation will cause the blank to be moved into contact with the knives 5, and their penetrating points 6 will penetrate said blank and pass almost directly through the same at right angles to the face thereof, thereby forming at the upper end of the blank the portion 47 of the oval aperture. (Seen in Fig. 11.) It will be observed that the penetrating points of the knives thus perforate the blank and form the portion 47 at the upper end of the aperture almost at a right angle to the surface of the blank, thereby forcing a direct passage through the blank at this point, for a purpose which is well known and need not be mentioned. It will further be observed that the rollers 35, carried by the gear-wheel 21, are now in contact with what I may term the "lowest portions" of the cam 33. The hand-wheel 24 is now revolved in either or both directions, which will communicate motion to the gear-wheel 21, and consequently crank 18 and the frame 10, carrying the blank, will be caused to follow the movement of said crank, said frame reaching the limits of movement indicated by dotted lines in Fig. 10, and thereby forming an oval aperture in the blank of the contour shown in Fig. 11. The portion 48 of the wall of the aperture which is opposite the portion 47 is formed in a manner similar to the manner in which said portion 47 was formed, which has been described heretofore. In the meanwhile the gear-wheel 21 has been rotated until the rollers 35 have come in contact with the projections 34 on the cam 33, which has had the effect of separating the leaves 31 32 a distance of about three-fourths of an inch, the outer leaf 31 remaining stationary, while the inner leaf 32 has been urged inwardly, together with the blank-holding frame 10, carrying the blank, which operation has caused the blank to be urged farther toward the cutter-head and into contact with the finishing-edges 7 of the knives, which has had the effect of forming the rounded or flared portion 49 at one side of the aperture and on the face of the blank and has continued the movement until the crank 18 completes a circle or revolution. The side of the aperture that is opposite the finishing side of the knife is also finished in the same manner, continuous rotary movement of the hand-wheel 24 imparting to the blank-holding frame 10 and the blank carried thereby a reciprocatory movement first toward the cutter-head and then from the same, or vice versa, as the judgment of the operator may indicate, in order to impart the required finish to the blank.

In the manner above stated it will be seen that large numbers of blanks may be finished in a short period of time.

When it is desired to increase the size of the aperture in a blank, both in breadth and

in length, the crank-pin 17 is adjusted to the outer limit of the slot 27 in the crank 18, thereby increasing the throw of said crank and bringing about the result just referred to. In like manner, when the size of the aperture is to be diminished, the crank-pin 17 is adjusted so as to shorten the throw of the crank.

In case it is desired to shape apertures which are elongated to a greater degree than that shown in Fig. 11, the entire blank-feeding mechanism, including the leaves 31 and 32 and the frame 10, is raised or elevated, which may be done in different ways—for instance, by placing the shaft 25 in the next higher set of bearings 51, which will have the effect of removing the crank 18 a greater distance above the cutter-head and of bringing the swiveling bearing 14 in a higher plane or nearer thereto, whereby the movement of the blank-holding frame, and consequently the blank carried thereby, will be diminished laterally, yet remain the same vertically. Likewise when an aperture of increased lateral dimensions is desired the reverse adjustment of the blank-feeding mechanism should be made—that is, the shaft 25 should be lowered into the next set of bearings 51, which are immediately below the bearings 26, in which the shaft is shown in Fig. 8—and the width of the aperture in the blank will be correspondingly increased.

What I claim is—

1. A machine for shaping closet-seats, comprising a frame carrying a revolving cutter-head, a swivel-bearing, a frame carried thereby and vertically adjustable with relation thereto, and means for moving said frame laterally and longitudinally with relation to the cutter-head, substantially as and for the purpose set forth.

2. A machine for shaping closet-seats, comprising a suitable frame, a cutter-head mounted on said frame, a blank-holding frame 10, having a short vertical shaft 12 fixed in bearings at its lower end, the swiveling bearing 14, in which said shaft 12 is mounted to slide, crank-pin 17, carried by a crank 18 and engaging a bearing upon the upper portion of said frame 10, mechanism for rotating said crank, and mechanism for moving said frame 10 toward and from said cutter-head, substantially as shown and described.

3. In a machine for shaping closet-seats, the combination of a frame, a shaft adapted to carry the cutter-head, a blank-holding frame, as 10, having its lower end carried by a swivel-bearing 14 and its upper end mounted upon the pin 17 of the crank 18, a shaft 19, mounted in bearings 20 so as to lie in a direction parallel to that of the cutter-head shaft, a gear-wheel 21, mounted on said shaft, a pinion 22, mounted on shaft 23 so as to mesh with the teeth of wheel 21, a means for revolving said shaft 23, such as hand-wheel 24, said shafts and connections being mounted upon an oscillating frame formed of two leaves 31 and

32, pivoted at their lower ends, a roller 35,
mounted upon the outer surface of gear-wheel
21, a cam 33, fixed upon the leaves 31 so as
to be engaged by said roller, and means for
5 continuously urging said leaves 31 and 32 to-
ward each other, substantially as shown and
described.

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

FRANK F. WICHARD.

Witnesses:

BENJ. J. KLENE,
ED. E. LONGEN.