June 10, 1952 K. T. HANSEN 2,600,055

PICKET HEADER

Filed June 25, 1949 2 SHEETS—SHEET 1

Fig. 1

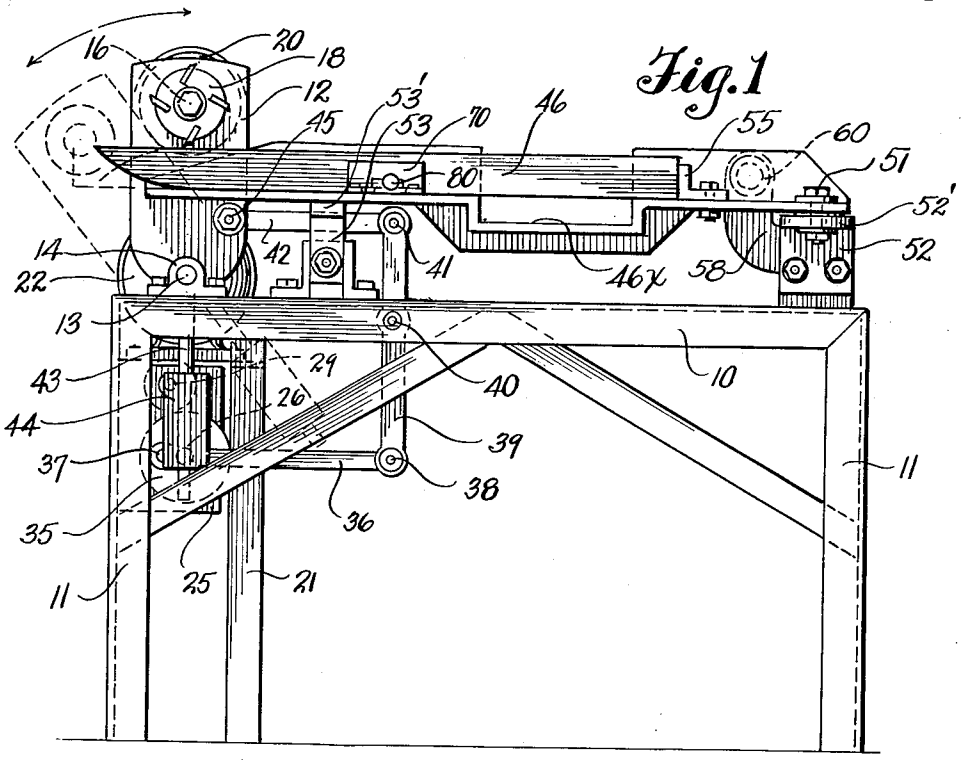
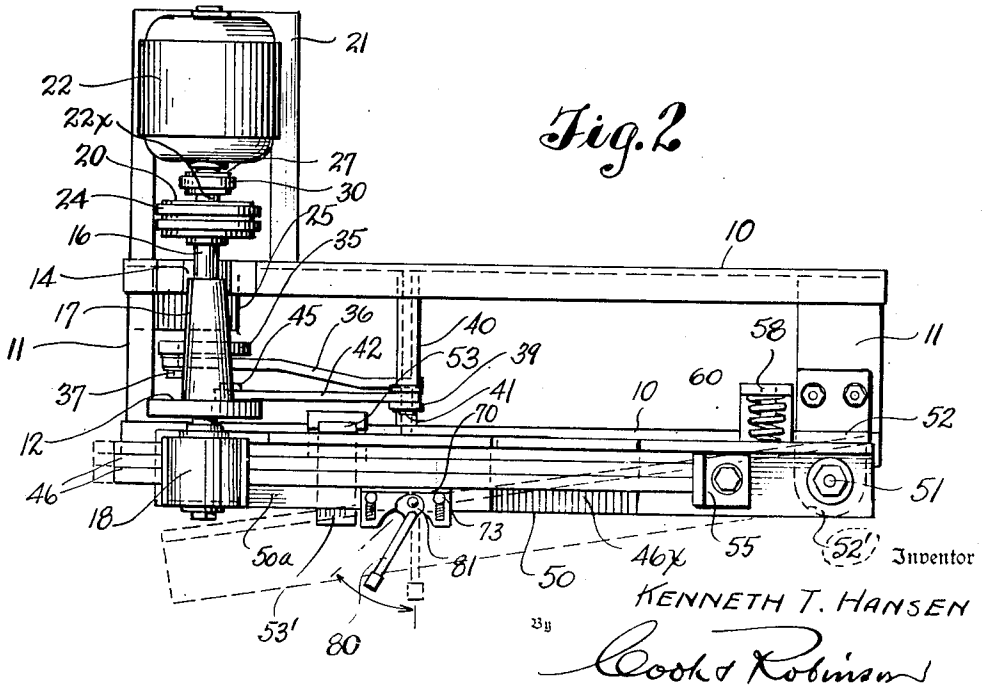


Fig. 2



Inventor
KENNETH T. HANSEN
By
Cook & Robinson
Attorney

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Fig. 3

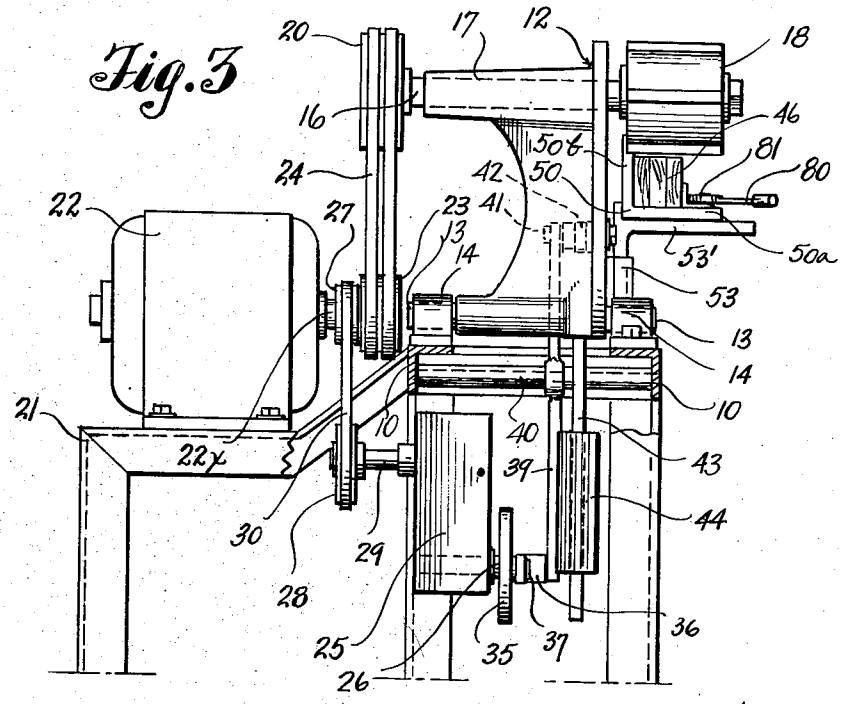


Fig. 4

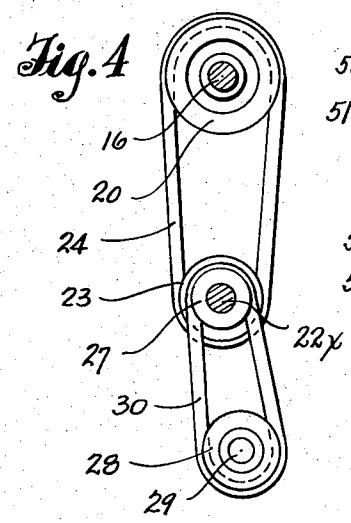


Fig. 5

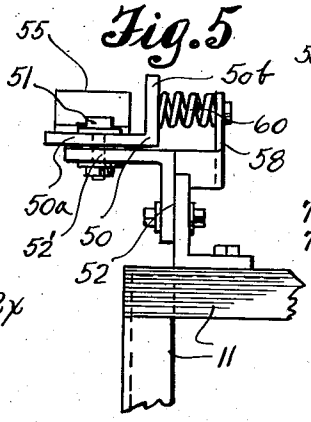
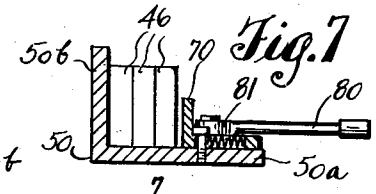


Fig. 7



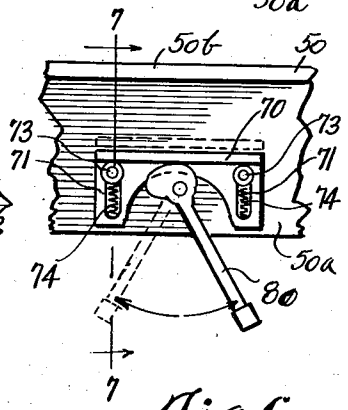


Fig. 6

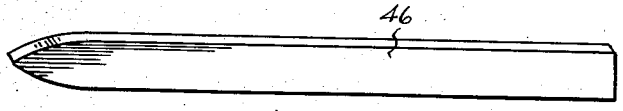


Fig. 8

Inventor

KENNETH T. HANSEN

By Cook & Robinson

Attorney

Patented June 10, 1952

2,600,055

UNITED STATES PATENT OFFICE

2,600,055

PICKET HEADER

Kenneth T. Hansen, Lake Stevens, Wash.

Application June 25, 1949, Serial No. 101,426

6 Claims. (Cl. 144—141)

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This invention relates to woodworking machines and it has reference more particularly to improvements in machines of those kinds usually referred to as "picket headers," and which are especially designed for the shaping, or pointing, of the ends of fence pickets, and the like; the principal objects of the invention being to provide a power operated machine that is easy to use and is practical in its operation; that can be used with safety by persons other than experts to produce pickets of a predetermined length and of exactly the same pattern, at a high rate of production; furthermore, to provide a machine whereby one or more wooden slats, as prepared for the making of pickets therefrom, may be worked on at the same time.

It is also an object of the present invention to provide a machine of the above character having an oscillating cutter head that is so counterbalanced that all jerkiness due to the oscillating action is eliminated, and a smoother operating and longer wearing machine is insured at reduced power consumption.

It is also an object of the invention to provide a machine of the character above stated, comprising a work support on which one or a plurality of picket forming slats may be positioned for contact by the cutter head at the same time, and a spring means for automatically actuating the support to a position that is out of the line of travel of the oscillating cutter head so that the slats may safely be placed thereon or the pickets removed.

Still further objects of the invention reside in the details of construction of the various parts of the machine and in their combination, relationship and mode of use, as will hereinafter be fully described.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a front elevation of a picket heading machine embodying the improvements of the present invention therein.

Fig. 2 is a top or plan view of the same, showing slats as disposed on the work holder, or carrier, for heading, and indicating, in dotted lines, the position to which the work holder is moved by the spring means out of line with the cutter head.

Fig. 3 is an end view of the machine.

Fig. 4 is a view showing the arrangement of belts for driving the cutter head and the head oscillating means.

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Fig. 5 is an end view of the work holder, or carrier, and that part of the main frame structure to which it is applied.

Fig. 6 is a plan view of the work holding clamp.

Fig. 7 is a cross-section on line 7—7 in Fig. 6.

Fig. 8 is a view of one of the finished pickets.

The present machine is designed especially for the heading or pointing of fence pickets of the character shown in Fig. 8, that are made from wooden slats. For this work, the slats are generally cut to designated dimensions, at least in width and thickness, and these are made into pickets by cutting away portions thereof to provide the slat, at one end, with a point, and at the same time, to give the picket a definite length. The present machine anticipates forming the point of the picket by symmetrically cutting away opposite edge portions, at one end of the slat, along arcuately curved lines. It further anticipates a machine that will permit operating on a plurality of slats at the same time if such is desired.

In a general way, the present machine comprises a horizontal support, or work holder, on which one or more wooden slats may be held in face-to-face relationship, a cutter head that is mounted to swing through a definite arc in the longitudinal plane of the slats, to engage the latter to cut away their end portions along an arcuate line. The work holder is pivotally mounted so that after the slats have thus been cut on one side, the holder may be swung to a position out of the line of the cutter head, the slats inverted thereon and the carrier moved back into position at which the oscillating head is caused to cut away the opposite edge portions of the slats, thus to provide each slat with a point.

The work holder or carrier is mounted for actuation horizontally under manual control from loading position into position for the contacting of the cutter head with the slats as held thereby, and is spring-actuated to unloading position. Also, the cutter head and its oscillating support are counterbalanced to insure maximum smoothness of operation.

Referring more in detail to the drawings:

In its present form of construction, the machine comprises a base frame structure preferably made from angle iron pieces, and having two parallel and horizontally extending top rails 10—10 and opposite end frames 11—11 that are fixed to and suitably braced to rigidly support the top rails. Mounted upon the frame structure thus provided, and at the left-hand end of the frame as shown in Fig. 1, is the cutter head supporting and oscillating frame 12. This frame is

set transversely of the rails 10—10, and at its lower end and at front and rear edges is equipped with axially aligned trunnions 13—13, pivotally contained in bearings 14—14 that are fixed to the rails 10—10. The frame 12 extends upwardly, and is supported for oscillation in the longitudinal vertical plane of the main frame.

At its upper end the frame 12 revolubly mounts a drive shaft 16 therein. Shaft 16 is parallel to the axial line of the trunnions 13 about which the frame oscillates and is revolubly contained in a bearing sleeve 17. Preferably the sleeve and the various other parts of the frame 12 are integrally cast, but other forms of construction might be used if desired.

Fixed on the shaft 16, at what will be referred to as its forward end, is a cutter head 18 which may be of any type suitable for the present purpose. Fixed on the shaft 16, at its rearward end, is a belt wheel 20 through the mediacy of which the shaft and cutter head 18 are rotatably driven.

Associated with the main frame structure, at a position back of the cutter head carrying frame, is a secondary frame structure, designated generally by numeral 21, which mounts an electric motor 22 thereon. This motor is of sufficient power for the driving of the cutter head 18 and for effecting the oscillating action of its carrier frame 12, as presently will be explained.

The electric motor 22 is secured on the frame 21 with its drive shaft 22*x* in exact axial alignment with the axial line of the mounting trunnions 13—13 of the oscillating frame 12, as has been shown in Figs. 2 and 3. Fixed on the motor shaft 22*x*, in alignment with the belt wheel 20 on the cutter head driving shaft 16, is a belt wheel 23. Belts 24 are extended about the aligned belt wheels 20 and 23, as best shown in Figs. 3 and 4, to provide for the driving of the cutter head.

The means for oscillating the cutter head carrying frame 12 comprises mechanism now to be described. Fixedly mounted in the main frame structure, below the position of the electric motor, is a gear reduction mechanism designated by a gear box 25. Mounted in this box and extended forwardly therefrom is a power output shaft 26. This shaft is adapted to be driven at relatively slow speed, through the mediacy of the reduction gearing (not shown) contained in the box 25. The reduction gearing is, in turn, driven by a power input shaft that has a driving connection with the motor shaft 22*x* as shown in Fig. 3; the connection comprising a belt wheel 27 fixed on the motor shaft, a belt wheel 28 on the power input shaft 29 of the reduction gearing and a belt 30 operating about the belt wheels 27 and 28.

The shaft 26 extends from the forward wall of the gear box and mounts a wheel 35 thereon, to which wheel one end of a pitman rod 36 is connected by means of a pivot bolt 37. The other end of rod 36 is pivotally connected by a bolt 38 with the lower end of a rocker lever 39. The lever 39 extends vertically and, medially of its ends, is pivotally mounted in the main frame by a pivot rod 40 extended horizontally between the rails 10—10. At its upper end the lever 39 is pivotally connected by means of a bolt 41 with one end of a link 42 which at its other end is pivotally attached, as at 45, to the cutter head carrying frame 12 at a point somewhat above its pivot axis.

The connecting mechanism embodied by the belts, belt wheels and links and levers, as above described, provides that the electric motor 22 will not only drive the shaft 16 and cutter head 18 but also will cause the cutter head to oscillate through a definite arc. The present linkage effecting a connection between wheel 35 and frame 12 provides that the cutter head will be oscillated from that full-line position in which it is shown in Fig. 1, directly above the line of the pivot axis of the frame 12, to the position at the left thereof in which it is shown in dotted lines. However, the arc may be increased or decreased as may be desired or required, by moving the pivot bolt 37 nearer to or further away from the center of wheel 35. For this adjustment the wheel may be radially slotted to adjustably contain the bolt, or may be provided with a series of holes at different distances from the wheel center, for selective application of the pivot bolt thereto. Also, the rate of oscillation may be such as to be suitable for the workman.

To counterbalance the weight of the frame 12 and cutter head 18, I have rigidly fixed a rod 43 in the frame 12 to extend directly downward therefrom, as seen in Figs. 1 and 3. On this rod, a counterweight 44 is adjustably secured. The weight of the member 44 and its position on the rod are such that the frame 12 and parts carried thereon will be balanced relative to the pivot axis about which they oscillate. Thus, the action of the oscillating parts is made smooth, jerkiness is eliminated and power required for satisfactory operation is materially reduced.

The wood pieces that are to be headed by the present mechanism are in the nature of slats, and have been designated by numeral 46. When they are to be worked on, in this machine, the selected number of slats are placed flatly together and disposed on a horizontal support or carrier as in Fig. 2. This carrier comprises a horizontally extending, elongated plate or bar 50 that is of angle iron form in cross-section, as noted in Fig. 5. The plate has a horizontal base flange 50*a* and a vertical inner edge flange 50*b*. At one end, here shown to be the end that is at the right-hand side in Fig. 1, the carrier bar is pivotally fixed by a pivot bolt 51 upon the horizontal leg portion 52' of a bracket 52 that is fixedly mounted on the right-hand end of the main frame structure, as seen in Fig. 1, thus permitting the work holder to be swung through a limited arc in a horizontal plane. Near its free end, the carrier is supported for its movement upon the horizontally extending arm 53' of a bracket 53 that is fixed on the forward rail 10 of the main frame. This bracket serves also to stop the inward swing of the work holder.

The free end, or swinging end, of the bar 50 extends substantially even with the cutter head and may be swung inwardly to a position directly beneath it as seen in full lines in Fig. 2, or outwardly to the dotted line position of Fig. 2.

Fixed on the bar, near its pivoted end, and adjustable therealong, is a stop 55 against which the inner end of the wood slats 46 that are to be headed may be engaged, to properly position them.

A bracket arm 58 extends inwardly from the bracket 52 and to the back side of the carrier bar and mounts a coiled spring 60 thereon that bears against the vertical flange 50*b* of the carrier, as noted in Fig. 2, to automatically move the carrier from the full-line position of Fig. 2 to the dotted-line position. This spring operates to keep the work out of the way of the cutter

head except when the work holder is manually moved to and held in position.

In order that the elevation of the carrier bar may be changed as may be required to accommodate slats of different widths, both the brackets **52** and **53** are made vertically adjustable, in length by any suitable means.

It is also a feature of this invention that the slat holder or carrier **50** is formed intermediate its ends with a downwardly offset portion, as at **46***x*, that provides hand space for easier gripping of the slats to place and to hold them in position for the operation thereon.

Assuming that the machine is so constructed, its mode of use is as follows: One or more wooden slats are placed face to face and disposed upon the carrier **50**, all held flatly together against the back flange **50***b* of the carrier, and with their inner ends engaged against the stop **55**. With the slats so disposed, they are then clamped in position by the clamp device which I have illustrated in Figs. 6 and 7. This comprises an angle iron plate **70** that is disposed upon the horizontal flange **50***a* of the supporting bar **50**. The base flange of the plate is formed with parallel slots **71**, as seen in Fig. 6, through which attaching bolts **73** are applied to flange **50***a* and small coiled springs **74** are located in the slots to bear against the bolts and outer ends of the slots thus to urge the clamp plate away from the vertical flange **50***b* of the carrier bar.

When the slats **46** are placed on the bar **50**, they are disposed back of the clamp bar **70** as shown in Fig. 7. Then the clamp is actuated against the slats to hold them. This action is effected by a clamp lever **80** that is pivoted on the flange **50***a* and has a cam head **81** arranged to engage the plate **70**. The swinging of the lever from full-line position of Fig. 6 to dotted-line position causes the clamp plate to be pressed by the cam against the slat and to secure them against any possible slippage under the action of the cutter head.

The act of clamping the slats can be incident to the swinging of the work supporting bar to position for the slat heading operation.

After the slats have been placed in position and clamped, the carrier is swung inwardly, as from the dotted-line position of Fig. 2, to the full-line position. This inward adjustment of the work holder is timed with the upward swing of the cutter head. Then, with the downward swing of the cutted head, the ends of the slats **46** will be cut along an arcuate line. This cut should extend not less than halfway from top to bottom edges of the slats. As the head **18** swings upwardly, the carrier **50** is permitted, under pressure of spring **60**, to swing outwardly in the clear of the head. Then the slats are inverted on the holder and in proper timing with the cutter head's oscillation, the work holder is again pushed back to position. The next downward swing of the head will cause the end portions of all slats to be cut away to leave them in the pointed form shown in Fig. 8. The carrier is then permitted, under pressure of springs **60**, to swing to unloading position, and the pickets are removed

If it be desired to so use the present machine, the oscillating means for the cutter head carrier frame could be disconnected and the frame secured at a fixed position. Then with the plate **50** secured in the full line position of Fig. 2, the pickets could be placed on the plate and shifted endwise against the cutter head to cut away portions of the slat at its end to obtain various

designs as determined by the elevation of the cutter head relative to the plate. Also, a novel form of picket head can be produced by causing the cutter head to swing to slight extent to the right from its starting position of Fig. 1 before swinging back to the dotted line finishing position.

It is a feature of this machine that the oscillating action of the cutter head has no effect on the belt connection with shaft **16** because of the axial alignment of the motor **22** with the pivot axis of the frame **12**. Also, the application of the counterweight **44** to the frame provides a means for obtaining perfect balance, that reduces wear, jar and jerkiness and odds to the life of the machine.

The adjustability of the stop **55** provides for cutting pickets of various lengths and the vertical adjustment of the supporting bar **50** provides for work on slats of different widths.

Machines of this kind may be made in various sizes, and changes in details of construction may be made without departing from the spirit of the invention.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent is:

1. A picket heading machine comprising in combination, a main frame structure, a cutter head carrier frame mounted in said frame structure for oscillation on a horizontal axis between an upright starting position and a laterally inclined finishing position, means for oscillating said frame through its arc of travel, a rotatably driven cutter head, mounted by said carrier frame at its swinging end, a picket mounting plate horizontally disposed at one side of the said carrier frame, and extending, therefrom, in the plane of the arc of travel of the cutter head, and pivotally fixed at the end farther away from the cutter head and supported to swing horizontally from a loading position outside of the path of travel of the cutter head, to operating position within the path of travel of the cutter head for heading thereby, and means on the plate against which pickets may be disposed when said plate is in loading position, to determine their finished length and so positioned that by swinging the plate to operating position, may be disposed in the path of travel of the cutter head for heading thereby.

2. A picket header, as recited in claim 1, wherein means supports the picket mounting plate for vertical adjustment relative to the starting position of the cutter head.

3. A picket header as recited in claim 1 wherein spring means is mounted in the main frame structure to bear against said picket mounting plate to automatically return it to loading position upon being released from operating position.

4. A picket header as recited in claim 1 wherein said picket mounting plate comprises a horizontal flange and a vertical flange against which pickets may be disposed to position them for the heading operation, a positioning stop adjustably fixed to the plate against which the ends of the pickets may be engaged to establish their finished lengths and a clamp means mounted on the plate and operable to clamp the pickets tightly against the vertical flange and against slippage during a heading operation.

5. A machine as recited in claim 1 wherein the cutter head has a mounting and driving shaft rotatably mounted in the carrier frame parallel to the axis of oscillation of the carrier frame, a belt pulley fixed on said shaft, a driving motor mounted in the main frame and disposed co-

axially of the axis of oscillation of the carrier frame, a belt pulley on the motor shaft and a belt operating about said pulleys to drive the cutter head as the carrier frame is oscillated.

6. A picket heading machine comprising in combination, a main frame structure, a cutter head carrier frame mounted in said main frame for oscillation on a horizontal axis, between an upright starting position and a laterally inclined position, a shaft rotatably mounted in said carrier frame, at its swinging end, parallel with the axis of oscillation, a cutter head mounted on the shaft, a belt pulley fixed on said shaft, a motor driven shaft coaxially aligned with the axis of oscillation of the carrier head, means operable by the said motor driven shaft to oscillate the carrier frame, a picket mounting plate horizontally disposed at one side of the said carrier frame and extended therefrom in the plane of the arc

of travel of the cutter head, and pivotally fixed at its outer end and supported to swing horizontally, means for positioning and clamping pickets on the plate to swing therewith from position out of the path of travel of the cutter head into said path of travel for heading thereby.

KENNETH T. HANSEN.

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