

Oct. 21, 1969

G. O. REED

3,473,584

VENEER LATHE KNIFE TILTING SUPPORT

Filed Sept. 15, 1967

2 Sheets-Sheet 1

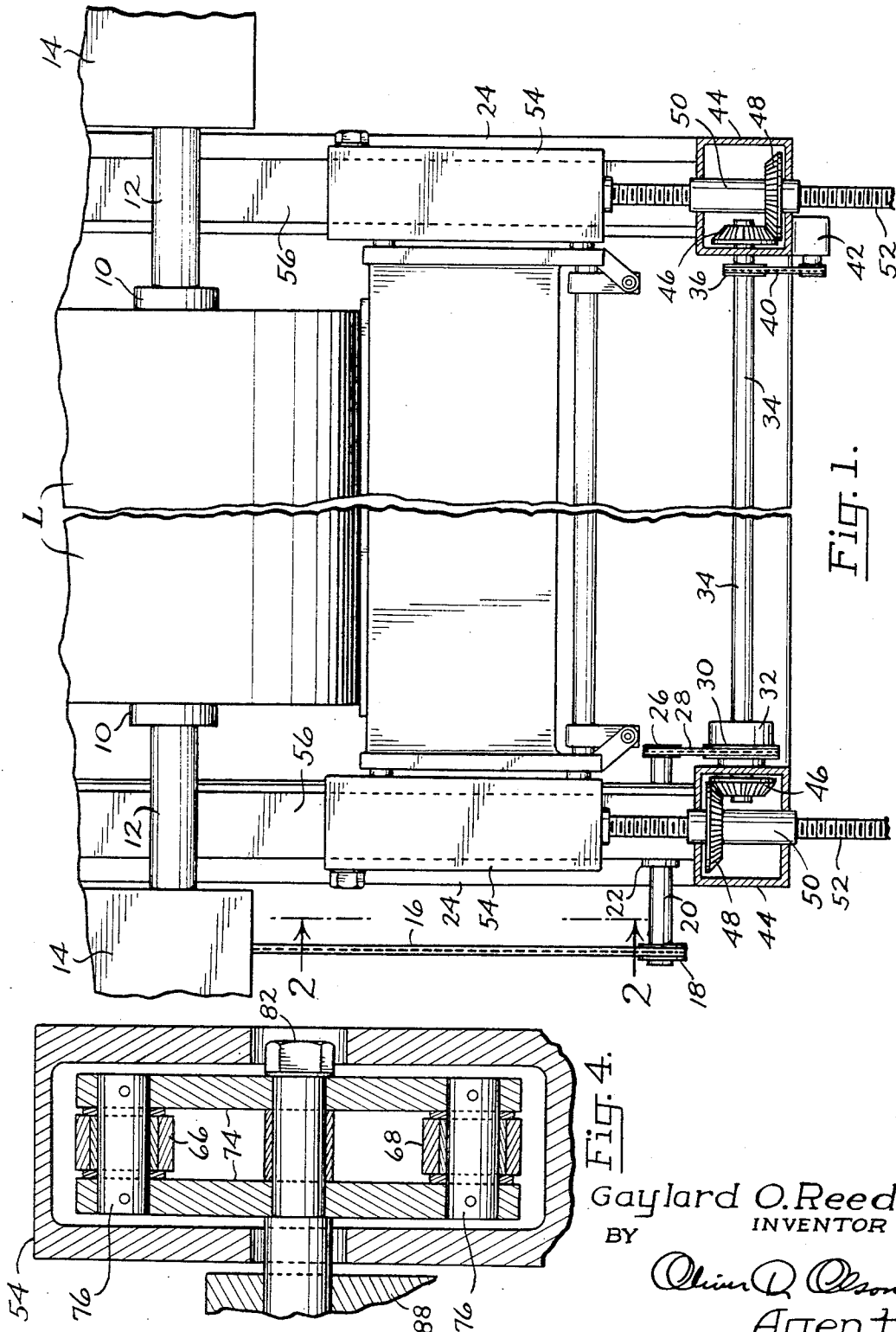


Fig. 4.

Gaylard O. Reed
INVENTOR

BY

Olin D. Olson
Agent

Oct. 21, 1969

G. O. REED

3,473,584

VENEER LATHE KNIFE TILTING SUPPORT

Filed Sept. 15, 1967

2 Sheets-Sheet 2

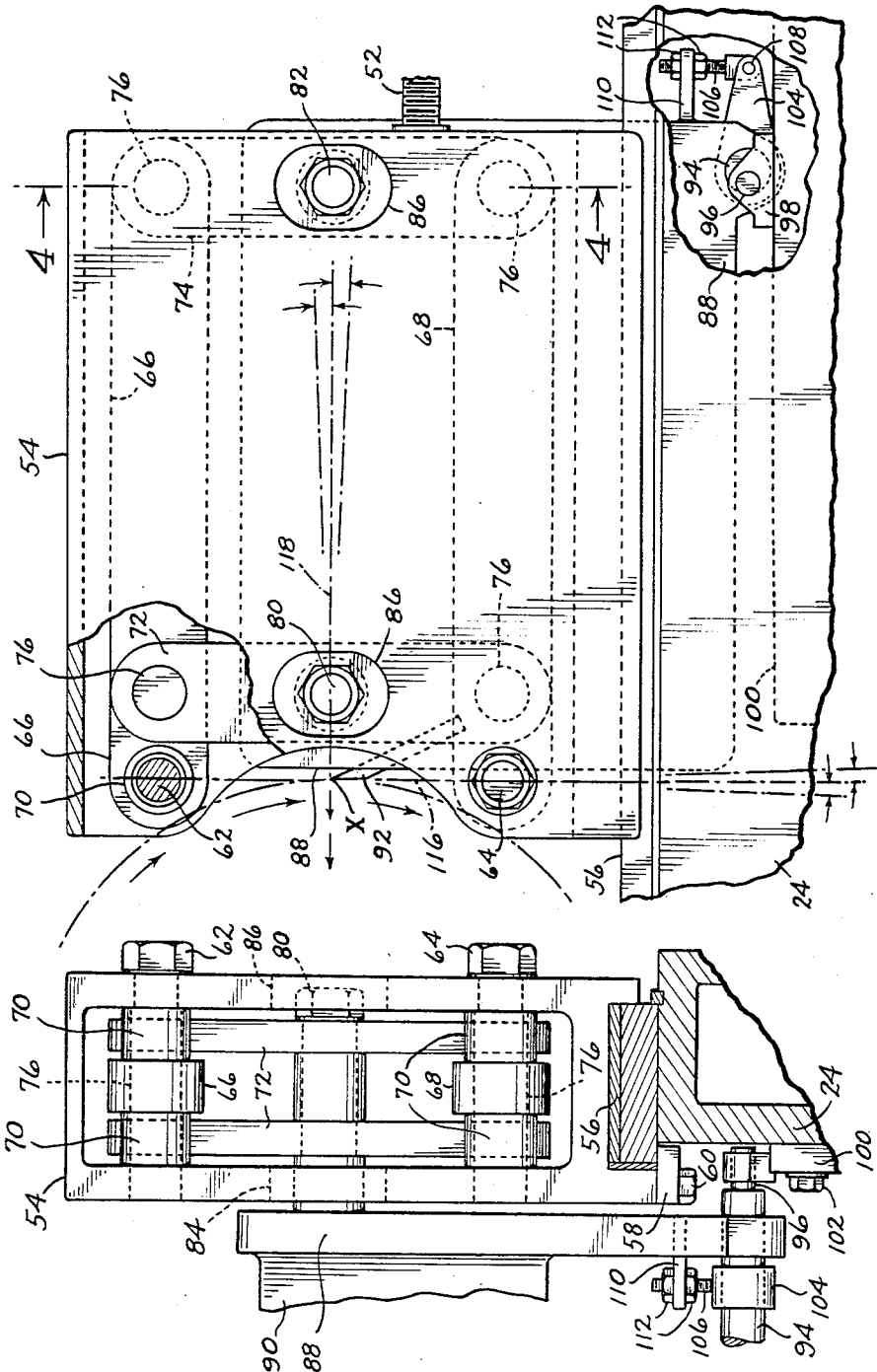


Fig. 2.

Fig. 3.

Gaylard O. Reed
INVENTOR

BY

Oliver O. Reed
Agent

1

3,473,584

VENEER LATHE KNIFE TILTING SUPPORT

Gaylard O. Reed, Portland, Oreg., assignor to Salem Equipment, Inc., Salem, Oreg., a corporation of Oregon
Filed Sept. 15, 1967, Ser. No. 668,086

Int. Cl. B271 5/02

U.S. Cl. 144—212

6 Claims

ABSTRACT OF THE DISCLOSURE

A pair of parallelogram linkage assemblies are mounted pivotally on laterally spaced movable carriages and a lathe knife support is mounted pivotally on the linkage assemblies. The intersection of planes extending through the axes of the pivots of the linkage assemblies and lathe knife support, respectively, defines the position of the cutting edge of the lathe knife, and this position remains fixed during angular tilting of the knife by pivotal adjustment of the linkage assemblies.

Background of the invention

This invention relates to veneer lathes, and more particularly to a novel lathe knife tilting support.

Wood veneer is produced by the continuous feeding of a lathe knife horizontally toward the axis of rotation of a peeler log. As the diameter of the log decreases progressively it is necessary to adjust the angle of the knife progressively in order to maintain the optimum cutting action. Further, the optimum cutting angle of the knife varies with different woods.

Lathe knife supports have been provided heretofore to accommodate tilting of the knife to desired angles while attempting to maintain the cutting edge of the knife at a predetermined position. However, such supports are characterized by a heavy, bulky and costly construction which utilizes open-sided bearings exposed to the abrasive action of debris. The resulting rapid and excessive wear is reflected in a magnified displacement of the knife edge from its proper position, resulting in veneer production of varying thickness. To minimize this adverse result, some prior supports incorporate, at substantial cost, power means for maintaining the bearing firmly seated as they wear.

Summary of the invention

In its basic concept the veneer lathe knife tilting support of the present invention utilizes an adjustable parallelogram knife supporting assembly which allows its mounting on full diameter bearings, whereby to minimize bearing wear by shielding against entrance of abrasive debris and to maintain knife position even with nominal bearing wear.

It is by virtue of the foregoing basic concept that the primary objective of the present invention is achieved, namely to overcome the primary disadvantages of prior knife support construction as previously described.

Another important object of this invention is the provision of a veneer lathe knife tilting support which is of simplified construction for economical manufacture, which is of minimum bulk and weight yet sufficiently rugged for precise operation and long service life.

The foregoing and other objects and advantages of the present invention will appear from the following detailed description, taken in connection with the accompanying drawings of the preferred embodiment.

Brief description of the drawing

FIG. 1 is a fragmentary foreshortened plan view of a veneer lathe knife tilting support embodying the features of the present invention.

2

FIG. 2 is a fragmentary side elevation as viewed on the line 2—2 in FIG. 1, portions being broken away to disclose details of internal construction.

FIG. 3 is a fragmentary view in front elevation as viewed from the left in FIG. 2.

FIG. 4 is a fragmentary sectional view taken on the line 4—4 in FIG. 2.

Description of the preferred embodiment

Referring primarily to FIG. 1 of the drawing there is shown for purposes of illustration a conventional veneer lathe assembly which includes a pair of opposed chucks 10 adapted to support between them a peeler log L to be reduced to veneer. The chucks are driven by rotary spindles 12 connected through gear reduction units 14 to a source of rotary power (not shown).

Means also is provided in conventional veneer lathes to move a knife supporting carriage forwardly toward a log progressively as the log is reduced in diameter, so as to produce a strip of veneer of substantially uniform thickness. In accordance with the present invention such means is provided by a drive chain 16 engaging a pair of sprockets. One of the sprockets (not shown) is contained within and is driven by one of the gear reduction units 14. The other sprocket 18 is secured to one end of a transverse shaft 20 supported in bearings 22 mounted on one of a pair of laterally spaced bases 24. The bases are secured to a suitable foundation.

The opposite end of the shaft 20 is connected through the sprocket 26 and chain 28 to a sprocket 30. This sprocket is coupled releasably through the electrically controlled magnetic clutch 32 to the transverse driven shaft 34. This shaft also is connected through the sprockets 36, 38 and chain 40 to a rotary hydraulic motor 42 mounted on one of a pair of spaced gear housings 44 secured to the bases 24.

The driven shaft 34 is supported between the pair of gear housings 44 and extends parallel to the rotational axis of the spindles 12. The opposite ends of the shaft mount a pair of bevel gears 46 one located in each gear housing. Each of these gears meshes with a bevel gear 48 secured to an internally threaded nut 50 extending rotatably through its associated gear housing. Each nut receives these through an elongated drive screw 52.

The drive screws are secured against rotation one to each of a pair of laterally spaced hollow carriages 54. The carriages are mounted upon laterally spaced elongated ways 56 for sliding movement toward and away from the chuck and spindle assemblies. For this purpose the underside of each carriage is provided with a groove dimensioned to receive the associated way. The ways are secured one to each base 24 by any suitable means, and the inner longitudinal edge of the way projects slightly beyond the inner edge of the associated base (FIG. 3). A plate 58 secured to the underside of the carriage, as by means of the bolts 60, underlaps this projecting edge portion of the way to prevent upward displacement of the carriage.

Between the laterally spaced upstanding side walls of each carriage, adjacent the front end thereof, are supported a pair of vertically spaced pivot bolts 62 and 64 (FIG. 2). These bolts pivotally support the front ends of the pair of vertically spaced links 66 and 68, respectively, centered between the side walls of the carriage by the spacers 70. These links extend rearwardly within the hollow carriage and are interconnected pivotally by at least one pair of horizontally spaced links 72 and 74, by means of the pivot pins 76. In the embodiment illustrated, two such pairs of links are provided, one on each side of the vertically spaced pair of links 66, 68. The pins 76 may be secured to the links 72 and 74 by such means as the lock pins 78 (FIG. 4).

3

A pair of pivot bolts 80 and 82 are mounted one on each of the horizontally spaced links 72 and 74, respectively, and project through registering, enlarged openings 84 in the inner wall of the carriage 54. A similarly enlarged registering opening 86 in the outer wall of the carriage accommodates the bolt head. The inwardly projecting ends of the pivot bolts mount the side plates 88 of a veneer knife holder 90 which extends transversely between said end plates. The holder is provided with a transversely elongated groove in which to adjustably receive an elongated veneer knife 92 (FIGS. 1 and 2). As is well known, the knife is slightly longer than the log to be peeled.

The end plates 88 of the holder extend downward beyond the bottom sides of the carriages 54 and are provided at their lower rearward ends with aligned openings for rotatably supporting the transverse cam shaft 94. The opposite end portions 96 of the shaft are reduced in diameter and offset from the rotational axis of the cam shaft. These end portions are journaled in bearings carried by the supporting shoes 98. The shoes are mounted slidably one on each of a pair of laterally spaced rails 100 secured to the inner edges of the bases 24 below the ways 56, as by means of the bolts 102. Whereas the ways extend longitudinally in a horizontal plane, the rails slope slightly downward toward their front ends, for the purpose explained more fully hereinafter.

A pair of lever arms 104 are secured to the transverse cam shaft 94, one adjacent each side plate 88 of the knife holder, and extend rearward therefrom. The rearward end of each lever arm pivotally supports one end of an adjustment screw 106, by means of the pivot pin 108. The threaded portion of the adjustment screw extends upward freely through an opening in a bracket 110 secured to the adjacent side plate 88, and adjustment nuts 112 are threaded onto the screw on opposite sides of the bracket. Thus, by appropriate rotation of the nuts the lever arm is caused to rotate the cam shaft 94 eccentrically about the axis of the end shafts 96, thereby raising or lowering the rearward ends of the side plates 88 and the blade holder 90.

Since the side plates 88 of the blade holder are secured through the pivot bolts 80, 82 to the horizontally spaced links 72, 74 which, in turn, are connected pivotally to the vertically spaced links 66, 68 by the pins 76, vertical movement of the rearward ends of the side plates effects pivotal movement of the parallelogram assemblies of links about the axes of the fixed pivot bolts 62 and 64. Accordingly, the intersection X (FIG. 2) of planes 116 and 118 extending through the axes of the fixed pivot bolts 62 and 64 and the knife housing mounting bolts 80 and 82, respectively, remains fixed throughout the range of pivotal movement of the parallelogram linkage assemblies. Therefore, by placing the cutting edge of the lathe knife 92 on this line of intersection, the knife may be tilted to any desired angle without moving the position of its cutting edge.

As the carriages 54 and supported knife housing 90 moves forward toward the axis of rotation of the peeler log, the shoes 98 move downward along the forwardly sloping rails 100. The rearward ends of the knife housing side plates thus move downward. By operation of the parallelogram linkage assemblies the knife is caused to rotate clockwise (FIG. 2) about its cutting edge at the intersection X of the planes. The angle of the knife thus is adjusted automatically, progressively as the peeler log is reduced in diameter.

The initial angular position of the knife relative to the log may be adjusted by appropriate manipulation of the adjusting nuts 112, to accommodate the peeling of logs of different species of woods.

The front ends of the side walls of the hollow carriages 54 preferably are cut away arcuately (FIG. 2) between the vertically spaced pivot bolts 62, 64 to provide recesses into which the adjacent portions of the log supporting

4

chucks 10 may be received. This allows the knife to be moved as closely as possible to the rotational axis of the log. In actual practice this distance is determined by the diameter of the chucks.

It will be understood that rapid movement of the carriages away from the chucks, for chucking a new log, and toward the chucks to bring the knife into initial operative position, is effected by activation of the hydraulic motor 42 with magnetic clutch 32 deenergized. Then, by energizing the clutch, the forward feeding of the carriages and knife is controlled by the gear mechanism 14.

It will be apparent to those skilled in the art that various changes may be made in the size, shape, number and arrangement of parts described hereinbefore. For example, power means may be used to rotate the adjustment cam shaft 94 in place of the screws 106. Further, since the function of the eccentric cam shaft 94 and associated lever arms and adjustment screws is to adjust the knife holder 90 relative to the carriages 54, and since the adjustment mechanism illustrated operatively interconnects the knife holder and carriages, through the rails 100, ways 54 and bases 24, similar adjustment means may be provided to directly interengage the knife holder and carriages, as will be apparent. The foregoing and other changes may be made, as desired, without departing from the spirit of this invention and the scope of the appended claims.

Having now described my invention and the manner in which it may be used, I claim:

1. A veneer lathe knife tilting support, comprising
 - (a) a carriage support,
 - (b) carriage means reciprocative on the support toward and away from a log to be peeled,
 - (c) a pair of first link members spaced apart vertically adjacent the carriage means,
 - (d) a pair of first pivot members spaced apart vertically on the carriage means and each pivotally mounting one of the first link members adjacent the front ends of the latter,
 - (e) a pair of second link members spaced apart horizontally adjacent the first link members,
 - (f) a pair of second pivot members associated with each second link member and pivotally interconnecting the first and second link members,
 - (g) a pair of third pivot members mounted one on each second link member, and
 - (h) a lathe knife holder mounted pivotally on the third pivot members,
 - (i) the intersection of planes extending through the axes of the first and third pivot members, respectively, defining the position of the cutting edge of a lathe knife mounted on the lathe knife holder.
2. The support of claim 1 including adjustment means operatively interengaging the lathe knife holder and carriage means for pivoting the knife holder relative to the carriage means about the line of intersection of said planes.
3. The support of claim 2 wherein the adjustment means comprises
 - (a) a bearing mounted slidably on the carriage support,
 - (b) a shaft journaled rotatably in the bearing,
 - (c) an eccentric cam secured to the shaft and journaled rotatably in the lathe knife holder,
 - (d) a lever secured at one end to the cam, and
 - (e) screw means on the opposite end of the lever secured adjustably to the knife holder.
4. The support of claim 1 including
 - (a) an elongated drive screw projecting rearward from the carriage means and secured against axial rotation, and
 - (b) a rotary driven member mounted on the carriage support and having an internally threaded bore receiving the drive screw therethrough.
5. The support of claim 1 wherein the carriage means

5

comprises a pair of laterally spaced carriage members each having associated therewith a pair of first link members, a pair of first pivot members, a pair of second link members, a pair of second pivot members and a pair of third pivot members, the lathe knife holder being disposed 5 between the spaced carriage members and supported pivotally on the spaced pairs of third pivot members.

6. The support of claim 5 including

(a) an elongated drive screw projecting rearward from each carriage member and secured against axial rotation, 10

(b) a rotary driven member for each screw mounted on the carriage support and each having an internally

6

threaded bore receiving the adjacent drive screw therethrough, and

(c) drive means interengaging the driven members for simultaneous rotation.

References Cited

UNITED STATES PATENTS

2,340,532 2/1944 Jackson ----- 144—209

FOREIGN PATENTS

982,356 2/1965 Great Britain.

1,210,976 2/1966 Germany.

DONALD R. SCHRAN, Primary Examiner