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KNIFE STRUCTURES PARTICULARLY INTENDED FOR THE PEELING OF VENEER

Filed July 23, 1963

2 Sheets-Sheet 1

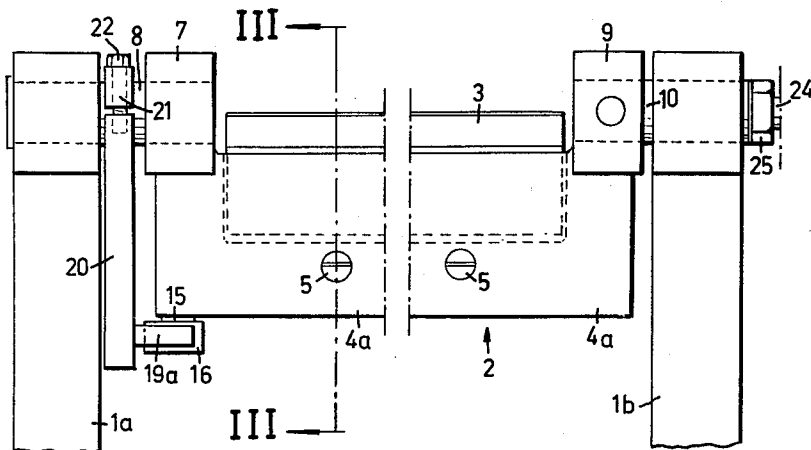


FIG. 1

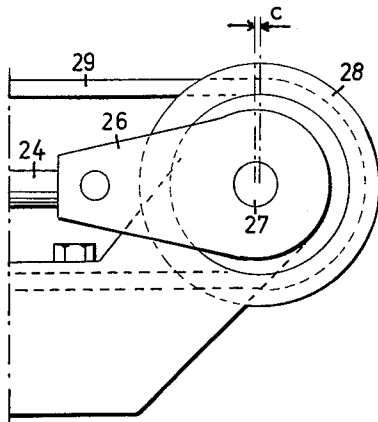


FIG. 2

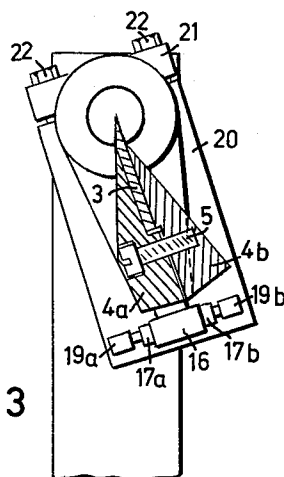


FIG. 3

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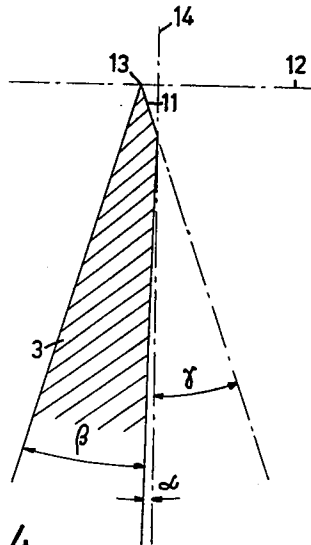


FIG. 4

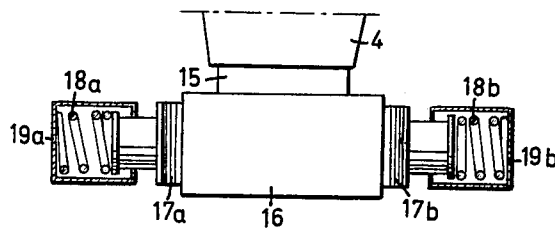


FIG. 5

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KNIFE STRUCTURES PARTICULARLY INTENDED FOR THE PEELING OF VENEER

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5 Claims. (Cl. 144—212)

This invention relates to improvements in apparatus for the peeling of veneer from a log and comprising a knife which is rockable on an axis extending along the edge of the knife.

The principal object of the invention is to provide a knife structure, in which the cutting angle of the edge of the knife is automatically adjusted to the correct value in dependence of the pressure prevailing between the knife and the workpiece.

Another object of the invention is to provide a structure of the kind above referred to in which the veneer or the like produced by means of the knife structure will get a surface as smooth, even and free of scratches as possible.

With these and other objects in view the knife is, according to the invention, rockable through a limited angle of rotation in both directions, from a neutral position corresponding to a pre-determined angle of cutting, under the influence of the pressure of the log and the veneer against the knife during the peeling operation.

A preferred embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 illustrates the left-hand portion of a structure according to the invention;

FIG. 2 constitutes a direct continuation of FIG. 1 and diagrammatically illustrates the right-hand portion of the structure;

FIG. 3 is a section on line III—III in FIG. 1;

FIG. 4 is a cross sectional view of the portion of the knife blade located nearest to its edge, on a much larger scale;

FIG. 5 is an enlarged partial view illustrating a detail of the knife as seen from the line III—III in FIG. 1.

In the drawings 1a and 1b designate a pair of arms comprised in a frame-work and carrying the knife which is generally designated 2. The most essential parts of the knife are a knife-blade 3 and a knife-holder comprised of two members 4a and 4b and in which the knife-blade 3 is adjustably clamped by means of screws or bolts 5 (FIG. 3). According to the invention the entire knife 2 is rockably or pivotally hinged in the arms 1a, 1b, and is for this purpose at its left-hand end provided with a socket 7 which is rotatable about a rotatably journaled pivot pin 8 and at its right-hand end rigidly connected by means of a socket 9 to a stub shaft or pivot pin 10 which is rotatably journaled in the right-hand arm 1b of the frame-work. According to the invention the edge of the knife-blade 3 coincides with the pivot axis of the knife, that is the center lines of the pivots 8 and 10, or is at least parallel thereto.

The knife-holder 4 is provided with an arm 15 which carries a die or the like 16 (FIGS. 3 and 5). Two opposed surfaces of the die 16 each engage a stop 17a and 17b respectively thereby maintaining the knife in a neutral position. These stops 17a, 17b are preferably resilient or elastic and may be comprised of bolts or the like the ends of which located remote from the die engage springs 18a and 18b respectively. These springs are arranged in recesses in fingers 19a, 19b protruding from a common plate 20 which is by means of a bridge

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21 and two bolts 22 (FIGS. 1 and 3) rigidly connected to the pivot pin 8.

The cutting conditions of the knife are illustrated in FIG. 4 which is a cross sectional view of the knife-blade 3. The dash-dot line 12 in FIG. 4 extends through the edge 13 of the knife-blade 3 and the axis of rotation of the log of which veneer or the like is to be peeled by means of the knife 2, which axis is located to the right of the knife-blade. The dash-dot line 14 is perpendicular to the line 12. The surface of the knife-blade 3 facing the log (not shown) forms an angle $\alpha=2^\circ$ with the normal 14 of the line 12. The angle β between the opposed faces of the knife is approximately 16° . In a preferred embodiment the edge is bevelled in an angle of 20° ($\alpha+\gamma$) where $\gamma=18^\circ$ in FIG. 4) with respect to that surface of the knife blade 3 facing the log. The width of the bevelled surface 11 is preferably 0.2 mm.

If the axis of rotation of the log were to be transferred rectilinearly along the line 12 towards the edge 13 in response to the decrease of the diameter of the log during the veneer peeling operation, a constant angle of cutting could easily be maintained. If, however, the log is clamped between a pair of jointly pivotal levers, as in a preferred embodiment of the invention, the axis of rotation of the log will, during the veneer peeling operation, move along an arc of a circle instead of along the straight line 12, in dependence of the rotation of the levers carrying the log. To maintain a constant angle of cutting of the knife 2, it is consequently necessary to rotate the neutral position of the knife in concert with the pivotal movement of the log carrying levers. In the illustrated embodiment this is accomplished by rotating the pivot pin 8 (FIG. 1) and jointly therewith the plate 20, the fingers 19 and the stops 17 in dependence of the pivotal movement of the log carrying arms.

By the rockable suspension of the knife the advantage is attained, that the knife-blade will automatically become adjusted to the most suitable angle of cutting in relation to the log in dependence of the pressure prevailing during the veneer peeling operation, inclusive the pressure of the log against one side of the knife-blade 3 and the veneer just peeled against the other side of the knife-blade.

The pivot pin 10 is coupled to a rod 24 (FIGS. 1 and 2) by means of a diagrammatically shown universal joint 25 which permits the pivot pin 10 to rotate in relation to the rod 24. The latter is in its turn by means of a link or connecting rod 26 connected to an eccentric bolt 27 on a pulley 28 which is driven through a trapezoid belt or the like 29 by means of a driving means (not shown). The eccentricity c of the eccentric bolt 27 with respect to the axis of rotation of the pulley 28 is of the magnitude 0.5–1.5 mm., preferably 1.0 mm., and the rotational speed of the pulley is about 2500–3500 r.p.m., preferably 3000 r.p.m. This means that the knife 2 will reciprocate rectilinearly with a frequency of 3000 strokes per minute and a length of stroke of about 2 mm. backwards as well as forwards, the socket 7 sliding on the pivot pin 8. Through this reciprocation, the edge of the knife will remain sharp longer than if the knife had been stationary, and in addition to that scratches in the veneer are avoided which could else easily arise on account of minute, local damages to the edge.

The apparatus according to the invention also rings about the advantage that the entire knife 2 which occupies an accurately adjusted position, may easily be made removable. When the edge of the knife-blade has become dull, the entire knife 2 may be removed and replaced by a newly-ground knife the blade of which has beforehand been adjusted in its proper position. Therefore, it is not necessary to carry out the usually time consuming

adjustment of a newly-sharpened knife-blade in the peeling lathe, the standstill-time of which may thus be considerably reduced.

While the invention has been particularly described and shown with reference to one preferred embodiment thereof, it will be understood by those skilled in the art, that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

What I claim is:

1. In apparatus for the peeling of veneer from a log: a knife which is rockable, on an axis extending along the edge of the knife, through a limited angle of rotation in both directions, from a neutral position corresponding to a pre-determined angle of cutting, in response to the pressure of the log and the veneer against the knife during the veneer peeling operation.

2. Apparatus as claimed in claim 1, and comprising a pair of resilient stops for defining the neutral position of the knife and for limiting the extent of the rotational movement of the knife about its axis of rotation.

3. Apparatus according to claim 2, characterized in that the stops defining the neutral position of the knife are compulsory movable in a plane substantially perpendicular to the axis of rotation of the knife in response to the decrease of the diameter of the log during the veneer peeling operation.

4. In apparatus for the peeling of veneer from a log: a knife which is rockable, on an axis extending along the edge of the knife, through a limited angle of rotation in both directions, from a neutral position corresponding to a pre-determined angle of cutting, in response to the pressure of the log and the veneer against the knife during the veneer peeling operation, said knife being also

movable in a direction substantially parallel to the edge of the knife; a pair of resilient stops for defining the neutral position of the knife and for limiting the extent of the rotational movement of the knife about its axis of rotation, said stops being compulsorily movable in a plane substantially perpendicular to the axis of rotation of the knife in response to the decrease of the diameter of the log during the veneer peeling operation; a driving means for imparting a substantially rectilinear reciprocating motion of a minute amplitude and a high frequency to the knife in said direction; and a coupling means connecting said driving means to one end portion of the knife.

5. In a veneer peeling lathe of the type, in which the log is pivotally supported by two levers which are jointly rotatable and mounted for pivotation towards the knife in response to the decrease of the diameter of the log during the veneer peeling operation: a knife which is rockable, on an axis extending along the edge of the knife, through a limited angle of rotation in both directions, from a neutral position corresponding to a pre-determined angle of cutting, in response to the pressure of the log and the veneer against the knife during the veneer peeling operation; and a pair of resilient stops for defining the neutral position of the knife and for limiting the extent of the rotational movement of the knife about its axis of rotation; said stops being located on an arm which is rotatable in dependence of the rotational movement of said log supporting levers for maintaining a pre-determined cutting angle.

No references cited.

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