United States Patent

Johnson

[15] **3,670,791**

[45] **June 20, 1972**

[54] METHOD OF JET BREAKING VENEER TO NARROW WOOD FLAKES

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[21] Appl. No.: **54,392**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 630,396, April 12, 1967, Pat. No. 3,526,258.

[52] **U.S. Cl.** .....**144/326 A,** 144/176, 225/93, 225/94

[51] **Int. Cl.**.....**B27l 11/00**

[58] **Field of Search**.....225/1, 2, 93, 94, 96.5; 144/176, 326 A, 162; 83/22, 24, 177, 4

[56] **References Cited**

UNITED STATES PATENTS

3,570,732 3/1971 Merck 225/94

Primary Examiner—Frank T. Yost
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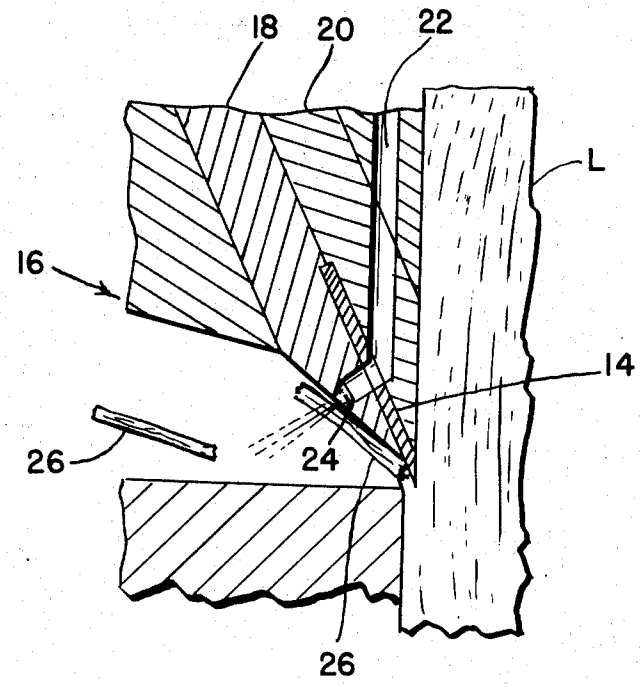
[57] **ABSTRACT**

Method employing a fluid jet, i.e., the forceful rush of pressurized vapor or gas through an orifice to flex, pull and break more or less continuous veneer along a weak line in the grain from the parent wood to controlled narrow width. The jet breaking occurs while the veneer is being sliced from the parent wood across the grain to predetermined thickness and length. The flake produced has a defined and predetermined size in all three dimensions.

3 Claims, 3 Drawing Figures



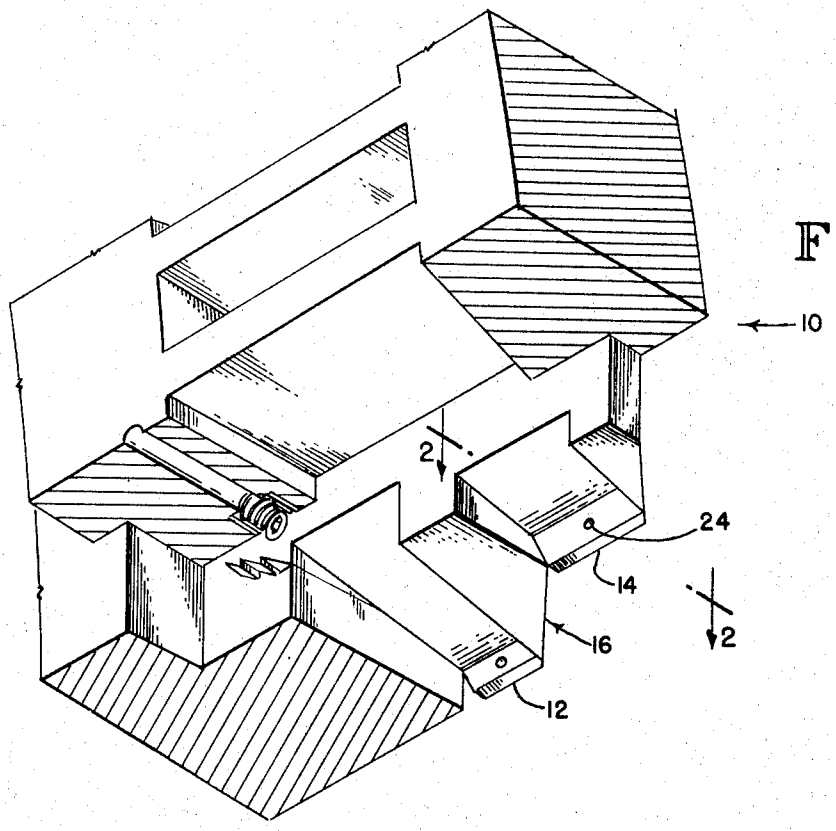


FIG. 1

FIG. 2

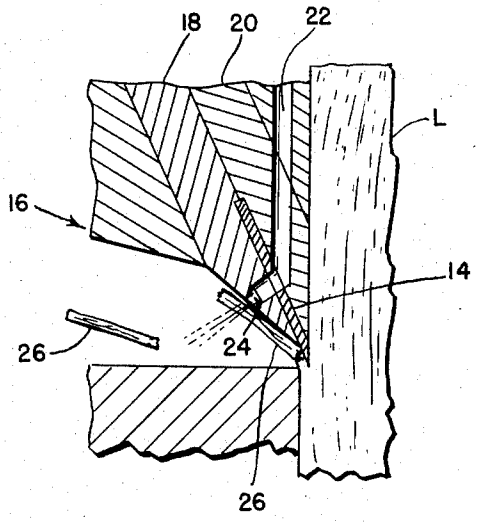
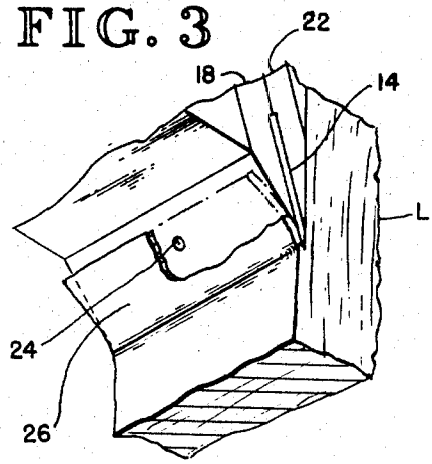


FIG. 3



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METHOD OF JET BREAKING VENEER TO NARROW WOOD FLAKES

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of my copending patent application entitled Method and Means for Improved Production of Wood Flakes filed Apr. 12, 1967 under application Ser. No. 630,396, now U.S. Pat. No. 3,526,258.

BACKGROUND OF THE INVENTION

This invention pertains to the production of narrow wood flakes. More particularly, this invention relates to the method employing a fluid jet, i.e., the forceful rush of pressurized liquid, vapor or gas through an orifice, to flex, pull and break more or less continuous veneer along a weak line in the grain from the parent wood.

As brought out in the Forest Product Journal, Oct., 1964, in an article entitled Particle Board Quality as Affected by Planer Shaving Geometry, prepared flakes produce better quality board than do planer shavings. The paper brings out some advantages of flat cut flakes of narrow width and mentions that flakes used in experiments were hammermilled to "reduce them to more uniform size" (break them to narrow width). This is considered a practice which is not effective in control of flake width which damages the fiber or strength of the flake. U.S. Pat. No. 3,164,511 for Strand Oriented Board describes a quality board of wood flakes or strands having a flake length-to-width ratio as low as 3 to 1, but preferably higher than 10 to 1. Applicant's U.S. Pat. No. 3,245,442 probably represented the state of the art prior to the filing of the copending application identified above. The invention therein provided mechanical flexing means for breaking the spiral ended veneer from the parent wood to flat-cut spiral-ended wide wood flakes. However, the mechanical method did not produce narrow wood flakes in which the desirable range of width is a fractional part of the length of the flake.

SUMMARY OF THE INVENTION

The present invention is the method employing a fluid jet, i.e., the forceful rush of pressurized liquid, vapor or gas through an orifice, to flex, pull and break generally continuous veneer along a weak line in the grain from the parent wood to a narrow width while slicing the veneer aross the grain to a predetermined thickness and length. The resulting narrow wood flake product can be used in flacer plywood, strand oriented board, artificial or reconstituted lumber, mechanical and chemical pulp and other products. The flakes also are of a consistent size in all three dimensions.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a partial perspective view of a portion of a cutter head showing cutting blades in position for cutting;

FIG. **2** is a partial cross section view along the line **2—2** of FIG. **1** and illustrating further details of cutting and breaking flakes to the desired width; and

FIG. **3** is a partial perspective view further illustrating cutting and breaking of the flakes.

DESCRIPTION OF PREFERRED EMBODIMENTS

It will be seen by reference to the drawings that a cutter head **10** includes blades **12** and **14** in appropriate blade mounting assemblies generally designated by the number **16**. Blades **12** and **14** have their cutting edges generally radially disposed with respect to the axis of the cutter head and each moves in a flat plane as the cutter head rotates. Thus by reference to FIGS. **2** and **3** it will be seen that for purposes of illustration the blade assembly includes not only the mounting block but blade holders **18** and **20**. A fluid passage **22** is

formed in the various parts to terminate in nozzle or orifice **24** in blade holder element **18**. Passage **22** is connected to a source (not shown) of pressurized liquid, vapor or gas which jets from nozzle **24** into flake evacuation space as shown. The cutting edge of blade **14** slices a generally continuous veneer **26** across the grain of the log to a predetermined thickness. The end or ends of the veneer are severed to a predetermined length by shearing, scoring, slant cutting or other means. The blade assembly advances across the grain and the sliced veneer **26** slides along the veneer side of the blade assembly, until the fluid jet emerging from nozzle or orifice **24** is encountered. The forceful rush of pressurized fluid jetting from the orifice or nozzle flexes, pulls and breaks the veneer **26** along a weak line in the grain and thus separates it from the parent wood. Thus there is produced a wood flake of predetermined thickness, length and controlled width within a narrow range.

The pressurized fluid may be liquid, vapor or gas. A liquid such as water would be effective. A vapor such as steam is also effective and would provide a source of heat to the cutting and breaking assembly such that "hot" slicing may be employed. It is contemplated however that compressed air will be the most acceptable jet fluid medium. The nozzle or orifice **24** may be round, oval, rectangular or of any other shape or size found to be advantageous for a given wood species, and for the thickness, length and width of flake to be produced. Location of the nozzle or orifice with respect to the cutting edge, together with the particular fluid used, pressure, cutting speed, size and shape of nozzle, wood species and other variables, will effect the range of the flake width. It may be found that more than one orifice or nozzle **24** will be required for each given cutting edge. Thus as the cutting edge advances across the grain of log L slicing off veneer **26** the fluid jet will force the veneer away from the blade and break it along a grain line. The fluid pressure will assist in evacuating a severed flake as shown in FIG. **2** from the cutting area so that it may be removed from the cutter head area.

The cutter head and blade assembly shown are illustrative only of the principle of the invention, and it will be appreciated that the method may also be employed in other machines where the cutting edge moves generally across the grain and where it is desired to break the veneer to a relatively narrow flake width.

What is claimed is:

1. The method of jet breaking employing the forceful rush of pressurized fluid from an orifice to flex, pull and break generally continuous veneer along a weak line in the grain from the parent wood to narrow width while slicing the veneer across the grain in the plane of the grain to predetermined thickness and length thereby producing narrow wood flakes predetermined in all three dimensions.

2. The method of breaking veneer to a controlled and predetermined range of width to produce generally dimensionally uniform flakes, comprising:

a. slicing a generally continuous veneer from its parent wood generally across and in the plane of the grain to predetermined thickness and length and

b. directing a jet of pressurized fluid against said veneer as it is being severed from said parent wood to break it along the grain line to produce a flake of generally narrow width.

3. The method, in production of wood flakes from logs, cants and the like, which consists in:

a. cutting across the grain of wood flakes to a predetermined thickness and length;

b. breaking said flakes from the parent wood to predetermined range of width generally simultaneously with the cutting with a jet of pressurized fluid directed against said flakes; and

c. conveying said wood flakes from the cutting and breaking area.

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