United States Patent [19]

Ord

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[45] **Aug. 7, 1973**

[54] **SMALL WOOD SAWMILL**

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[52] **U.S. Cl.** ..... **144/312,** 144/3 R, 144/3 P

[51] **Int. Cl.** **B27b 1/00**

[58] **Field of Search** ..... 144/312, 326, 3 R, 144/2 R, 309 R, 326 A, 37, 39, 41, 3 P; 143/46 F

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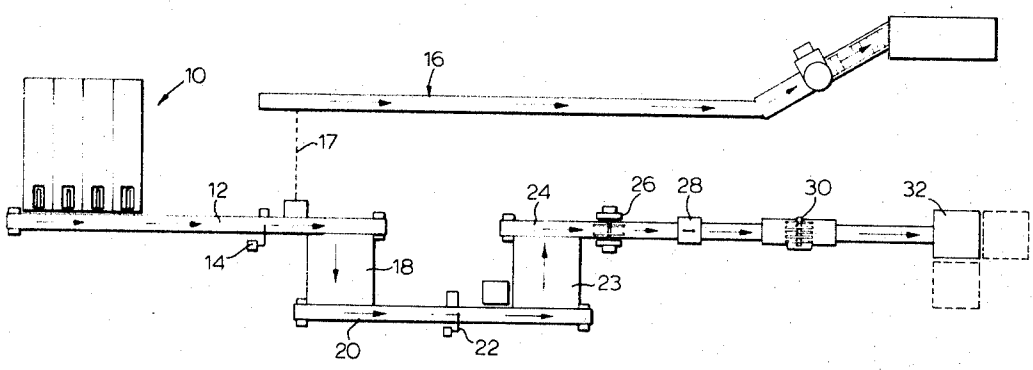
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[57] **ABSTRACT**

A method and apparatus for converting small-diameter logs into dimensional lumber in which defects and imperfections such as knots and rot are removed by severing and removing full-diameter sections containing said defects. The remaining clear wood is cut into suitable lengths for dimensional lumber and sawn into boards of desired proportions.

1 Claim, 5 Drawing Figures



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SHEET 1 OF 2

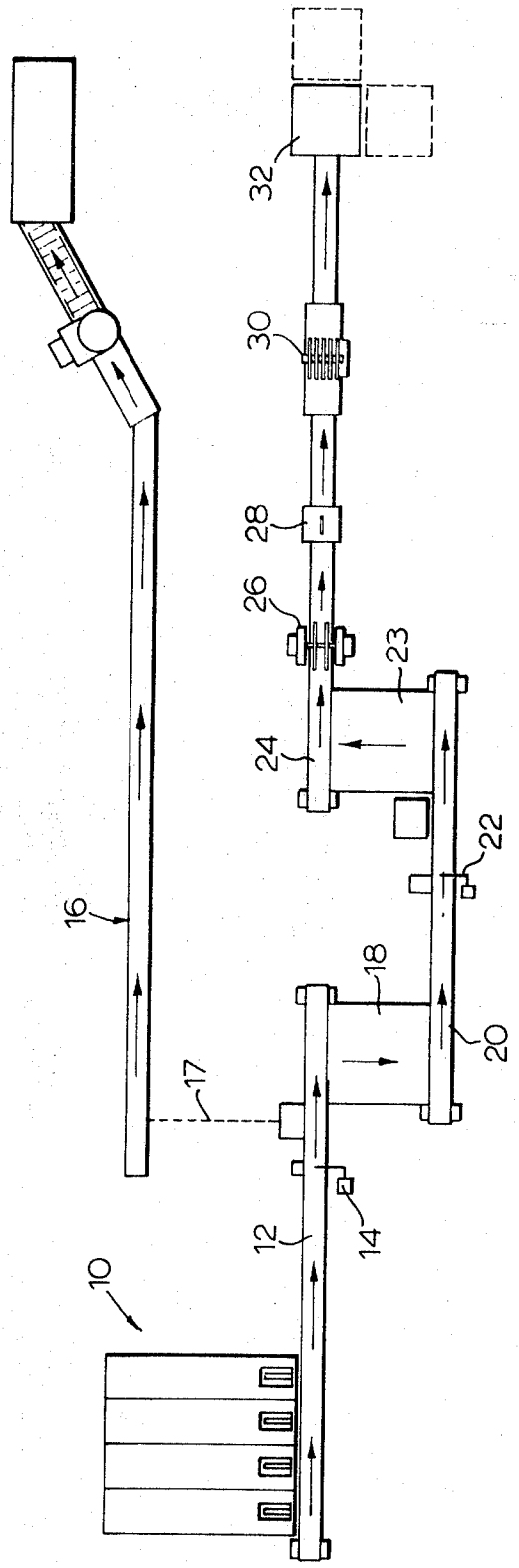


FIG. 1

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FIG. 2

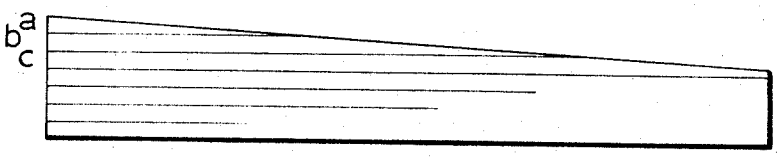


FIG. 3

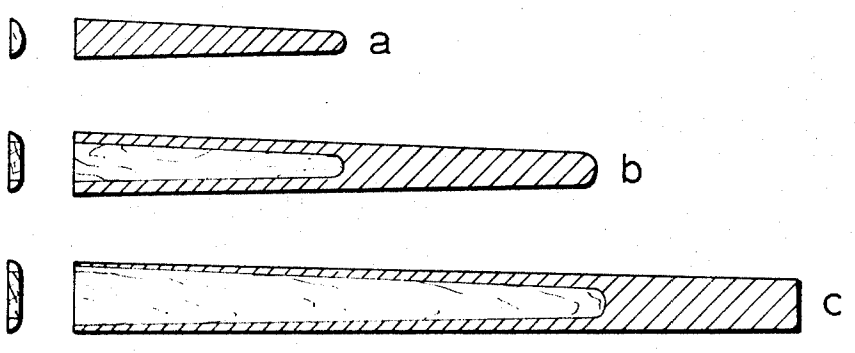


FIG. 4

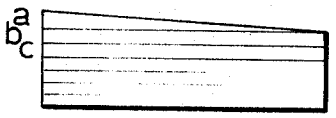
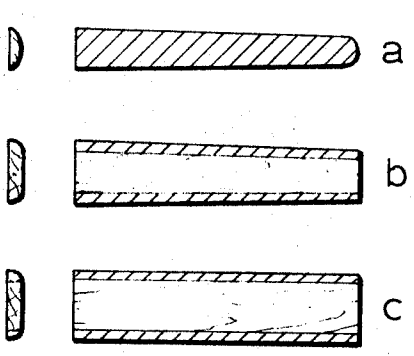


FIG. 5



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SMALL WOOD SAWMILL

This invention relates to a method and apparatus for converting small-diameter logs into dimensional lumber.

It generally is not economical to process, in a conventional saw mill, hardwood logs which have a small end diameter under the bark of less than 9–10 inches because of the lack of usable lumber produced by the equipment and because of the labour force involved. Accordingly, hardwood logs otherwise suitable for the production of high quality lumber are discarded or are chipped for pulp.

Conversely, it has been recognized that larger logs which provide a greater yield and higher productivity of lumber generally have more rot, knots and other like defects than the aforementioned small-diameter logs, and particularly logs with diameters as small as 4–5 inches. These small-diameter logs, or small wood, contain the best and highest quality of wood fibre, mostly sap wood, with knots of small size and, as a rule, very little rot defect.

The bulk of dimensional wood required in furniture manufacturing plants generally fall within the size range of from 12 inches to 36 inches in length, about 1- ½ to 4-½ inches in width, and with a nominal thickness of 1 inch dressed. The sawing of long cants into boards and the dressing and the severing of the dressed material into these suitable lengths and widths to produce the wood components required normally results in considerable losses and the discarding of wood due to the presence of undesirable wood defects.

To overcome this problem, the purchasing of kiln dried lumber for breakout has been largely obviated and furniture manufacturers now turn towards the purchase of wood components of suitable characteristics in length, width and thickness which can be readily machined into the finished components. These component products, known as dimensional lumber, are produced in volume by plants specializing in the manufacture of such wood parts from the middle grades of lumber.

I have found that the processing of small-diameter logs as small as 4 inches in diameter by the removal of knots and rot by severing full-diameter defective sections of the log, for the production of short log sections substantially of clear wood free of defects, results in the provision of dimensional lumber of suitable length which can be sawn into desired proportions with a minimum of waste and with an increase of productivity.

More particularly, the method of my invention comprises the steps of feeding small-diameter logs to a cut-off saw and severing imperfections from said log by the removal of full-diameter sections containing said imperfections from the logs, conveying said sectioned logs to a second cut-off saw for severing said sections into desired log lengths, conveying said log sections cut to length to a saw for the forming of at least one flat face on the said log, rotating said log on a conveyor with the flat face down, and conveying said log with the flat face down to a gang saw for cutting said log into a plurality of short product boards of the desired thickness.

It is a principal object of the present invention, therefore, to provide a method of processing small-diameter logs for the production of high quality, clear dimensional wood.

It is another object of the present invention to utilize hardwood heretofore discarded to waste or chipped for pulp.

And another important object of the present invention is the provision of dimensional boards at a reduced cost of manufacture.

These and other objects of the invention, and the manner in which they can be attained, will become apparent from the following detailed description of my method, in which:

FIG. **1** is a schematic view in plan of a saw mill utilizing the method of my invention;

FIG. **2** is a side elevation of an 8-foot log sawn into boards;

FIG. **3** illustrates in plan the three cuts and wastage therefrom made of the log shown in FIG. **2**;

FIG. **4** is a side elevation of a short log showing the corresponding three cuts for debarking the log and manufacturing boards; and

FIG. **5** is a plan view of the three cuts shown in FIG. **4** indicating the wastage therefrom.

Like reference characters refer to like parts throughout the description of the drawing.

The method and apparatus of my invention will now be described with particular reference to the plans shown FIG. **1.** Debarked small-diameter logs, generally in the size range of from about 4 to about 10 inches in diameter, are fed to log conveyor **12** by means of log loader, designated generally by numeral **10,** which comprises a four-arm hydraulic loader. The logs are conveyed by conveyor **12** to cut-off saw **14** which is selectively operated to remove knots, rot and the like defects from the log by severing and removing full-diameter log sections containing said defects. The defects are conveyed to a chipper feed conveyor designated by numeral **16** by trough **17** and removed from the system.

The remaining log sections containing clear wood of high quality such as sap wood virtually free of defects, are fed to a surge tank **18** for holding prior to conveying by conveyor **20** to cut-off saw **22** where the logs are cut into desired lengths of, for example, 30 inches, 32 inches, or 36 inches for maximum utilization of log lengths, and subsequently transferred to and held in surge tank **23.**

The product log sections are then conveyed by conveyor **24** to twin saw **26** which machines at least one, and preferably two, flat face on the short log. The short log is turned through 90° by a cant turner **28** and passed through a gang edger, sash gang or band gang saw designated by numeral **30** to produce the desired short boards of the required thickness. For example, boards of 1-⅛ inch thickness could be produced, it being understood that the said thickness can be readily varied as desired by the purchasers of dimensional wood.

The short boards produced are conveyed to table **32** for loading onto pallets and conveying by, for example, a fork truck to kiln stacks, not shown, for drying prior to rough and finish planing.

With reference now to FIGS. **2–5,** FIGS. **2** and **3** show planking and wastage from an 8-foot log and FIGS. **4** and **5** show corresponding cuts from a 3-foot log. A comparison of FIGS. **3** and **5** particularly points out the savings in wood provided by the method of the present invention, the latter Figure showing little, if any, wastage at the ends of the log sections as the planks are cut.

The present invention provides a number of important advantages. Small diameter logs which normally are either wasted or converted into pulpwood are utilized for the production of dimensional hardwood lumber, which will increase the production from a forest for the cutting of an equal stumpage. The best wood fibre, free of knots, rot and the like defects available in the small diameter logs, can now be utilized to significantly increase the productivity of a forest. The cost of manufacture of this dimensional lumber will be lower than the corresponding cost for a conventional saw mill operation which normally severs long lengths of lumber into short lengths to produce the desired dimensional lumber.

It will be understood, of course, that improvements can be made in the preferred embodiment of the present invention as described hereinabove without departing from the scope and purview of the appended claims.

I claim:

1. A method of producing dimensional lumber from small diameter logs which comprises the steps of:

1. feeding said logs to a cut-off saw and severing imperfections from said log by the removal of full-diameter sections containing said imperfections from the log;
2. conveying said sectioned logs to a second cut-off saw for severing said sections into log lengths corresponding to desired board lengths;
3. conveying said log sections cut to length to a saw for the forming of at least one flat face on the said log;
4. rotating said log on a conveyor with the flat face down;
5. conveying said log with the flat face down to a gang saw for cutting said log into a plurality of product boards of the aforesaid desired lengths.

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