

March 24, 1959

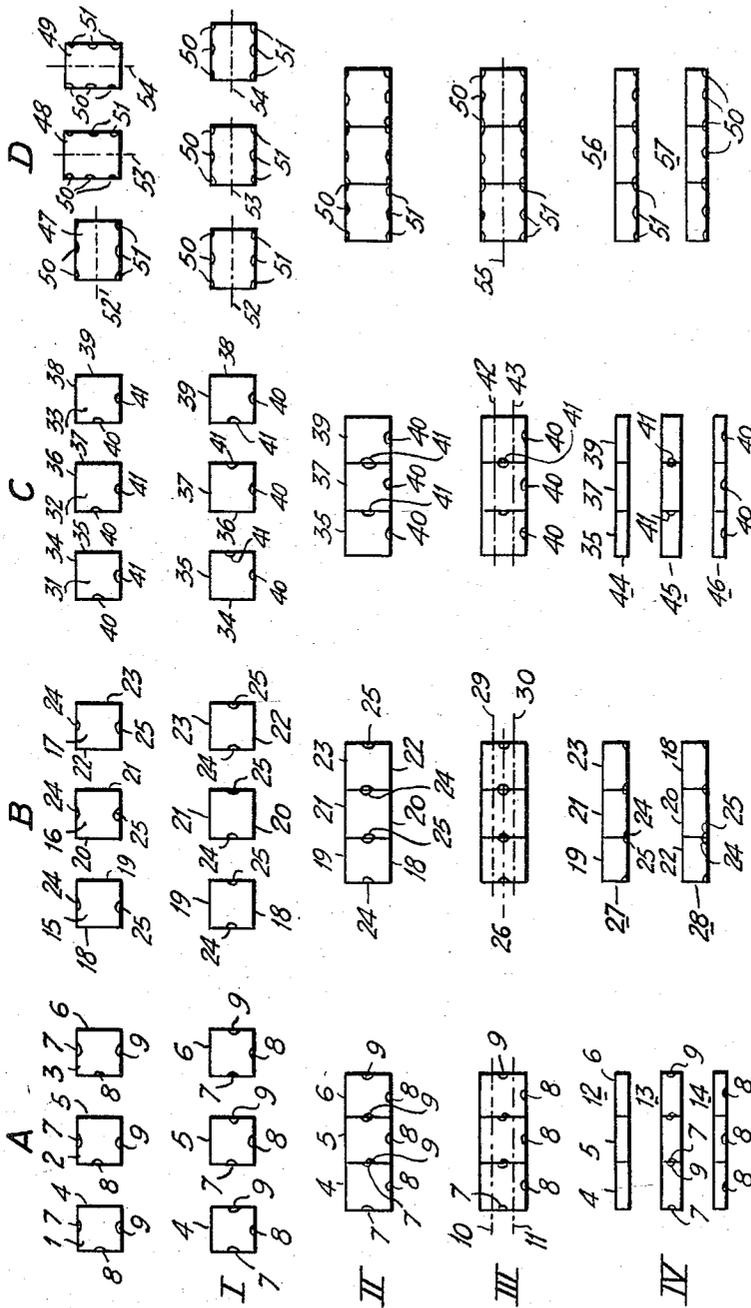
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METHOD IN MANUFACTURING WOODEN OBJECTS CONSISTING  
OF A PLURALITY OF JOINTED MEMBERS

2,878,844

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2 Sheets-Sheet 1

**FIG. 1.**



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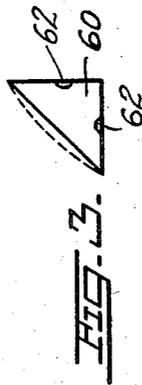
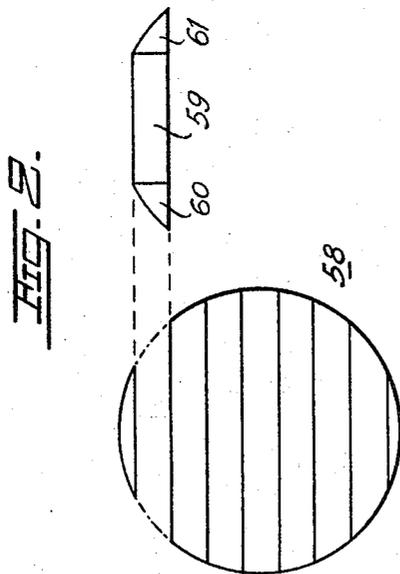
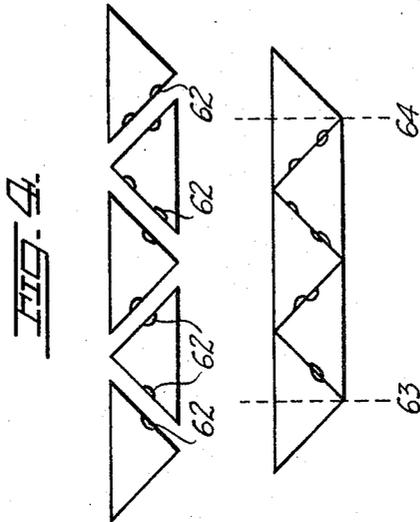
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**METHOD IN MANUFACTURING WOODEN OBJECTS CONSISTING OF A PLURALITY OF JOINTED MEMBERS**

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2 Claims. (Cl. 144—309)

In the saving of waste wood, it is sought already, in connection with the sawing of logs into planks, boards and so forth, to undertake to some extent a sorting of the wood according to certain quality standards. In this connection, however, one does not aim at any special use of the wood. However, if a window manufacturer, for example, is called upon to procure wood of a certain quality, he has to select what can be used for the manufacture of the window and then find any suitable use for the waste which necessarily is included in the wood selected regardless of quality selected. If the window manufacturer is unable to use the normally arising waste, he is compelled to select a higher grade of wood but then at a considerably higher price.

The present invention relates to a method of manufacturing boards, from which wooden articles can be manufactured, which consist of a plurality of pieces jointed together. The invention is principally characterized in that an initial material for example in the form of logs, is divided into pieces, suitably in the form of lengths which are sorted into groups with respect to surface quality similarities in such manner that each individual group will contain lengths having an equal number of faces free from defects after which a composite article or board-like structure is produced by jointing together lengths belonging to one or different groups. The lengths are oriented into relative positions before the jointing operation such as to cause the composite article to exhibit one or more non-defective external surfaces.

The invention may also be modified in that lengths having defective external surfaces but having non-defective portions extending along a plane parallel, for example, with any one of their faces, are oriented and jointed together in such a way as to cause said planes to coincide on a common plane through the composite board-like structure after which the board-like structure is severed along this plane into parts which exhibit non-defective external surfaces.

The invention makes it possible to make use of wood which is very inferior in quality and cheaper to procure instead of having to use high-quality board. Because of the low purchase-price the loss of material arising in the sawing of boards, planks or the like into smaller units may be ignored. When sawing up the initial material its quality need not be taken into consideration.

The sorting according to the invention may be effected manually or automatically, entirely or in part, or by a combination of both methods.

The invention is shown in the accompanying drawings illustrating embodiments of the invention and in which Fig. 1 is illustrative of how lengths are sorted, oriented and jointed together according to the invention for subsequent treatment; and Figs. 2 to 4 are illustrative of how waste wood can be saved by using the invention in conjunction with the sawing of boards from logs.

Fig. 1 shows four groups A, B, C, D of lengths or pieces sorted according to quality. The lengths are

shown in endwise views. Group A comprises lengths with one knotless long side, group B lengths with two knotless opposite long sides, group C lengths with two knotless adjacent sides, and group D comprises lengths with knotty sides and corner edges. In the examples shown the lengths of groups A, B, and C, have square cross-sectional shape, whereas the lengths of group D have a rectangular cross-sectional shape.

Group A comprises three lengths 1, 2, 3 each having one knotless side 4, 5 and 6, respectively. The knots are designated by 7, 8, 9 in all of the lengths of this group. Each side so designated may have one or more knots distributed over the side surface. The lengths may, however, be knotless in one of more intermediate sectional planes. After the lengths have been sorted into groups, as stated, the production is continued in four steps, I, II, III, IV in each group. In the first step I in group A, the lengths are oriented so that the knotless sides are turned in one and the same direction, that is to say upwardly in the figure, and so as to be lying in the same horizontal plane, the sides of the lengths presenting the knots 8 being turned downwardly. Then follows the second production step II, during which the lengths in their positions thus oriented, are glued together into a board-like structure or block, wherein the joint surfaces will contain the knots 7, 9, as will appear from the figure. The glue having set, the block is to be sawn into boards or slabs of a suitable thickness, the saw cuts 10, 11 being positioned in step III in planes which yield as far as possible knotless surfaces. The sawing operation is illustrated in step IV, three boards or slabs 12, 13, 14 being thus obtained from the block, member 12 is knotless throughout, member 13 is entirely knotless on both of its large sides while having knots 7, 9 on the narrow sides and within, whereas member 14 is knotless on its upper side and on the narrow sides thereof while presenting knots 8 on its under side. Thus entirely serviceable final products of good and excellent quality are obtained from the rather inferior original material 1, 2, 3.

The lengths of group B are denoted by 15, 16, 17. These lengths have two knotless opposite sides 18, 19 and 20, 21 and 22, 23, respectively. The knots are here designated by 24 and 25 in all lengths of the group. In the first step I the lengths are oriented as in group A, so that the knotless sides 19, 21, 23 and 18, 20, 22, respectively, coincide on a common plane, the sides 15, 21, 23 then facing upwardly. After that, the lengths 15, 16, 17 are glued together into a plank-like or board-like structure with the knotty sides jointed to one another. From this structure it is desired, for instance, to obtain two coarse boards each with one knotless surface. To attain this, the structure or block is sawn on a plane 26 extending through the knots 24, 25. In this way the desired coarse boards 27, 28 with a knotless upper side are obtained. In the actual case, however, the block may be sawn up in any other suitable manner, for instance on either sides of the knots, along the dotted planes 29, 30 if other board dimensions are desired.

Group C comprises the lengths 31, 32, 33 which have two adjacent knotless sides 34, 35 and 36, 37 and 38, 39, respectively. The knots of all lengths within the group are designated by 40 and 41. The lengths are first oriented so that the knotless sides 35, 37, 39 will face upwardly. The sides 34, 36, 38, which are also knotless, would then be turned to the left, and the glued board-like structure or block would present a knotty right-hand side. To avoid this, the length 33 is turned so that the knotless side thereof is disposed to the right, that is to say in an outward direction. The lengths are then glued together in the ordinary manner to form a board-like structure or

block which can be sawn up on the planes 32, 43, three boards 44, 45, 46 being thus obtained, of which 44 is knotless throughout, 45 shows knotless large and narrow sides, and 46 presents knotless narrow sides and one knotless large side.

Group D comprises the lengths 47, 48, 49. These are oriented in step I so that their middle planes 52, 53, 54 located between the knotty portions 50, 51 will substantially coincide. The lengths are glued together into a block which is then sawn on the common section plane 55 formed by said first-mentioned section planes, two boards 56, 57 being thus obtained that present one knotless large side.

One and the same object may also be composed of lengths belonging to two or more of the groups above mentioned.

According to the invention, the saw-cut surfaces may be of any arbitrary shape, as long as the final product obtains the desired outline, the lengths being then suitably oriented so that an external surface as knotless as possible is obtained, whereby boards with an outer knotless surface, for instance for window and door frames, may be produced from a starting material that could never be used otherwise for this purpose in view of the nature of the surface thereof.

Furthermore, it is possible according to the invention to utilize waste wood resulting from sawing up logs into boards. Fig. 2 shows a cross section of a log 58 sawn into boards. Because of the roundness of the log the uppermost and lowermost boards obtain chamfered edges, so-called wanés, as will appear from the board 59. The wanés are sawn off in forming the edges of the boards. In most cases these sawn-off wanés are considered as pure waste, generally called ribs. However, these ribs may be worked so as to present a triangular shape in cross section, as will be seen from Fig. 3, which shows the wane 60 on an enlarged scale after having been shaped, the broken line indicating the original contour.

Fig. 4 shows how these worked triangular ribs should be oriented relatively to each other for being glued together into blocks or possibly into finished boards. The sides presenting knots 62 are turned to face one another and are glued together. To provide the final shape of a board the chamfered outer edges of the board are cut off along the broken lines 63 and 64. In the manner indicated, waste may thus be made use of for manufacturing a good grade of lumber.

The portions of the boards 59 remaining after the wanés 60, 61 have been sawn off may constitute the starting material for producing the lengths shown in Fig. 1. At first long lists are produced by sawing up the boards along mutually parallel planes extending at right angles to the large sides. Such lists may for instance have a cross section of the dimensions 20 by 50 mm. After sorting and removing those lists, which have knotless large sides and/or narrow sides along their whole length, the remaining lists are cut into lengths, for instance 500 mm., which are then sorted in the manner described. Those lengths which have no knotless side, may be split along a longitudinal knotless middle plane and/or cut off centrally between its ends, so that at least one half obtains a knotless utilizable surface.

The jointing of the lengths may be effected by gluing and/or rabbeting. In the manufacture of floor boards, for example, it is suitable to displace the lengths mutually in their longitudinal direction, so that the end joints between the lengths form a surface pattern suited to the board.

Products according to the invention need not necessarily be composed of material in the form of lengths as an initial material of any other shape may be used. By using an initial material which is suitable for the purpose, articles of any desired shape may be produced.

By dividing the lengths in the manner above described

into a plurality of groups of mutually equivalent lengths, a far-carried rationalization is attained for the purpose of utilizing as far as possible the available wood, the various groups of lengths permitting of selecting lengths for the manufacture of objects, which fulfill different requirements with respect to sound surfaces and the number of knotless surfaces.

In dividing an unsorted supply of boards into lengths and in sorting the lengths into groups according to the invention, the number of lengths in the various groups will obviously be inversely proportional to the number of sound surfaces on the lengths, so that the group wherein the lengths have only one non-defective surface, will contain the greatest number of lengths, whereas the group wherein the lengths have three or four sound surfaces, has the least number of lengths. This distribution of the number of bars over the various groups will in practice be directly proportional to the demand for lengths having one or more sound surfaces.

What is claimed is:

1: A method of manufacturing wooden boards from waste-wood which comprises, providing individual lengths of wood all of a given form, of equal overall thickness, and evenly trimmed, sorting the lengths into a plurality of separate groups according to surface characteristics with each group consisting of an arbitrary number of lengths but all lengths within an individual group each having an equal number of faces free of surface defects, bonding the lengths appertaining to each individual group separately along their longitudinal edges to form a single layer of material forming a board-like structure of uniform thickness, before bonding disposing the lengths in such a manner that they individually present at least one non-defective face in a common direction and with the defects disposed substantially in common transverse planes of said board-structure, cutting the board-structure in a transverse direction and along the full length thereof along selected planes thereby to form a plurality of boards of selected thicknesses some of which are free of defects and others having the defects in common planes.

2: A method of manufacturing wooden boards from waste wood which comprises, providing individual lengths of wood or even length all of a given form, of equal overall thickness, and evenly trimmed, sorting the lengths into a plurality of separate groups according to surface characteristics with each group consisting of an arbitrary number of lengths but all lengths within an individual group each having an equal number of faces free of surface defects, bonding the lengths appertaining to each individual group separately along their longitudinal edges to form a single layer of material forming a board-like structure of uniform thickness, before bonding disposing the lengths in such a manner that they individually present at least one non-defective face in a common direction and with the defects disposed substantially in common transverse planes of said board-structure, cutting the board-structure in a transverse direction and along the full length thereof along selected planes corresponding with non-defective and defective portions intermediate of the outer faces of the board-like structure thereby to form a plurality of boards of selected thicknesses some of which are free of defects and others having the defects in common planes.

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