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Tamura et al.

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[45] **Jan. 30, 1973**

[54] **METHOD AND DEVICE FOR POSITIONING SHEET MATERIAL**

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[52] **U.S. Cl.** **271/58**

[51] **Int. Cl.** **B65h 9/06**

[58] **Field of Search** 198/127, 29; 271/52-53, 58, 48

[56] **References Cited**

UNITED STATES PATENTS

3,621,973 11/1971 Carlson 198/29

Primary Examiner—Edward A. Sroka

Attorney—Holman & Stern

[57] **ABSTRACT**

In a method and device for positioning a sheet material, the sheet material is conveyed on a plurality of conveyor rollers of minimized surface friction, caused to abut a stop member extending transversely at the forward end of the conveying path of the sheet material, and then the stop member is shifted along the transverse direction so that the sheet material abutting the stop member is displaced transversely toward another stop member extending along the conveying direction of the sheet material while the sheet material is supported on the conveyer rollers of minimized friction.

7 Claims, 4 Drawing Figures

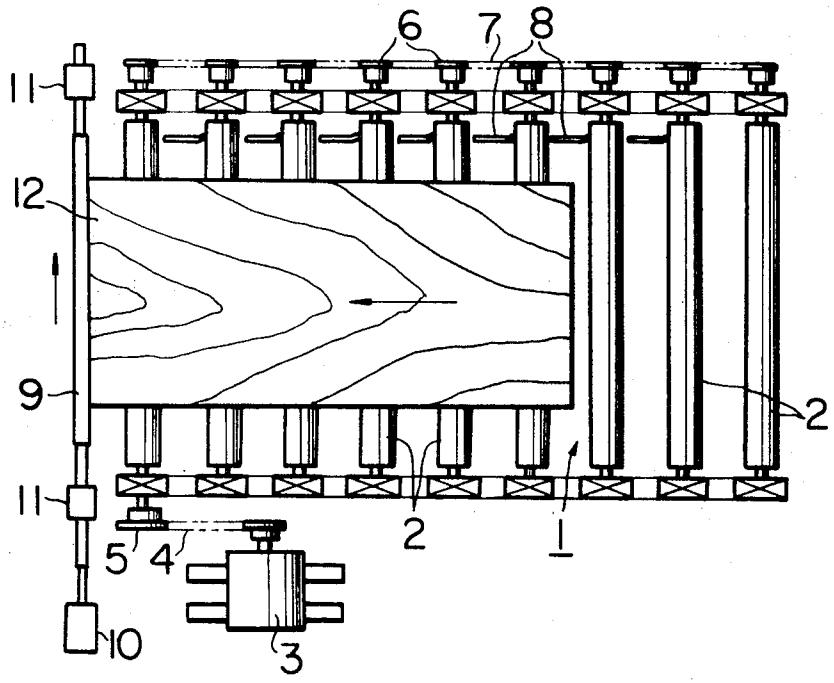


FIG. 1

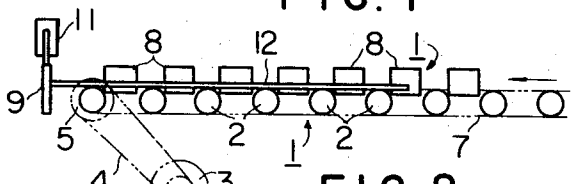


FIG. 2

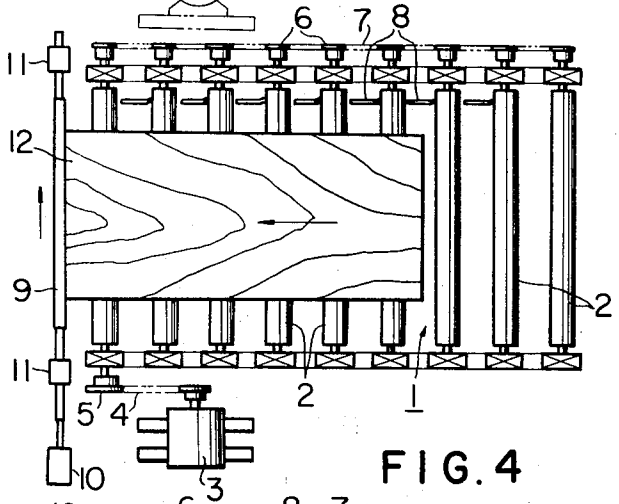


FIG. 4

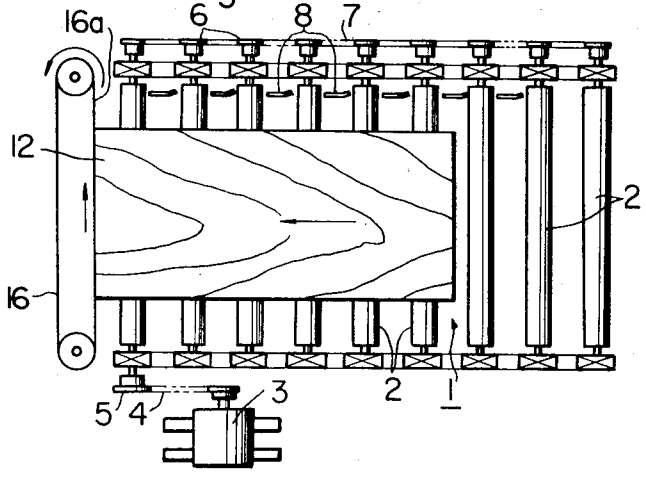
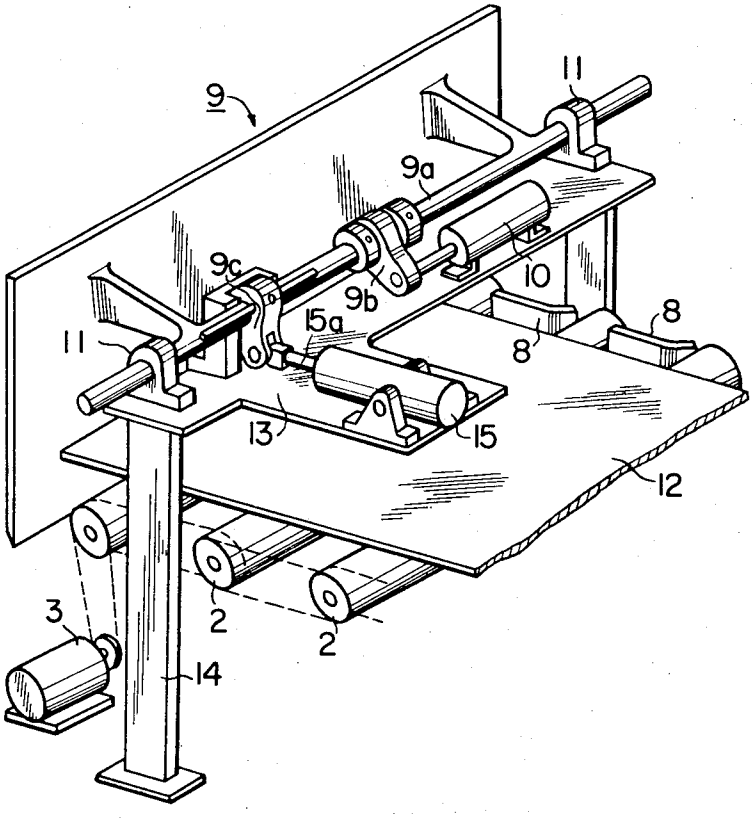


FIG. 3



METHOD AND DEVICE FOR POSITIONING SHEET MATERIAL

BACKGROUND OF THE INVENTION

This invention relates to a method and a device for positioning a sheet material laterally and longitudinally during conveyance thereof so that the subsequent processing of the sheet material can be carried out efficiently.

Heretofore, various methods for positioning a sheet material, such as a veneer sheet, laterally and longitudinally have been proposed, one example thereof utilizing a pusher for displacing the sheet material supported on a plurality of horizontal rollers toward a guide member extending along the feeding direction of the sheet material. Another example employs conveying rollers inclined in the transverse direction with respect to the feeding direction of the sheet material for displacing the sheet material laterally toward a guide member.

However, when the thickness of the sheet material is comparatively thin, as in the case of a single ply of a veneer sheet, and when the stiffness thereof is extremely low as in a direction transverse to the grain or the constituent fibers of the veneer sheet which includes numerous splits between the fibers, the sheet material tends to buckle or collapse at portions abutting the pusher, guide member, or the like, and correct positioning of the sheet material could not be obtained.

SUMMARY OF THE INVENTION

Therefore, a primary object of the present invention is to provide a method and device for positioning a sheet material wherein all of the above described shortcomings of the conventional methods or devices can be substantially overcome.

Another object of the present invention is to provide a method and device for positioning a sheet material wherein the lateral and longitudinal positioning of the sheet material can be accomplished simultaneously.

A further object of the present invention is to provide a method and device for positioning a sheet material which can be incorporated with other processing methods and devices.

These and other objects of the present invention can be achieved by a method of positioning a sheet material which comprises conveying a sheet material on a plurality of continuously driven conveyor rollers, causing it to abut a stop member extending transversely at the forward end of and perpendicular to the conveying path of the sheet material, and shifting the stop member along the transverse direction so that the sheet material abutting the stop member is thereby displaced laterally toward a stationary stop extending along the conveying direction of the sheet material while the sheet material is supported on the conveyor rollers being driven continuously.

In another aspect of the invention, the above described objects can be achieved by a device for positioning a sheet material comprising a plurality of continuously driven conveyor rollers adapted for conveying the sheet material in one direction, a stop member extending transversely at the forward end of and perpendicular to the conveying path and movable in the transverse direction, the stop member being also retractable from the conveying path of the sheet material, and stationary stop members provided along one side of a conveying path, whereby the sheet material is first caused to abut the first stop member and then shifted laterally to abut the second stop member.

The nature, principle, and utility of the present invention will be more fully understood from the following detailed description of the invention when read together with the accompanying drawings, in which like parts are designated by like reference numerals.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a simplified side elevation showing one example of a sheet material positioning device constituting a preferred embodiment of the present invention;

FIG. 2 is a plan view of the positioning device shown in FIG. 1;

FIG. 3 is a fragmentary perspective view showing a practical structure of the device shown in FIGS. 1 and 2; and

FIG. 4 is a plan view of a positioning device for a sheet material which constitutes another preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGS. 1 and 2 showing a preferred embodiment of the present invention, there is shown a roller conveyor generally designated by a numeral 1 and comprising a plurality of rollers 2, 2, which are driven by a prime mover 3 through a rotating chain 4 disposed around a sprocket wheel 5 and through another chain 7 commonly passed around sprocket wheels 6, 6, respectively fixed to the ends of the individual rollers 2, 2, on one lateral side. Between adjacent rollers 2, 2, there are provided stationary stop members 8, 8, respectively, on one lateral side. At the forward or downstream end of the roller conveyor 1, there is provided a movable stop member 9 which is made shiftable transversely, relative to the conveying direction of the conveyor 1, along guide members 11 when it is driven by, for instance, a hydraulic cylinder 10. The stop member 9 is also so constructed that it may be lifted or swung upwardly, and a sheet material 12 can be shifted to the subsequent position passing under the stop member 9 after it has been positioned correctly in the positioning device of this invention.

In the operation of the above described device, the sheet material 12 placed on the conveyor rollers 2, 2, is moved forwardly under the rotation of these rollers, until the sheet material is eventually brought to a position abutting the rearward surface of the stop member 9. The sheet material 12 is at this instant held in the position with all of the rollers 2, 2, located under the sheet material slidingly contacting with the under-side of the sheet material 12.

Then the movable stop member 9 is shifted in the arrow direction in FIG. 2, for instance, by a hydraulic cylinder 10. Since the forward or leading edge of the sheet material 12 is lightly urged toward the movable stop member 9 under the action of the slidingly contacting rollers 2, 2, the sheet material 12 is as a whole shifted toward the second stop members 8, 8, under frictional force caused between the movable stop member 9 and the leading edge of the sheet material 12. When the sheet material 12 abuts the second stop

members 8, 8, disposed along the lateral side of the conveying path of the sheet material, the sheet material is positioned correctly along its lateral direction and the longitudinal direction. Thus, if the movable stop member 9 is lifted upwardly or swung upward, the sheet material 12 can be moved to a position required for the subsequent processes by means of the conveying rollers 2, 2.

According to the present invention, since the sheet material is supported on a plurality of rollers which are constantly rotated, the sheet material is placed in an extremely movable condition because of the minimum friction between the sheet material 12 and the conveying rollers 2, 2. Furthermore, because of the rotation of the rollers 2, 2, the sheet material 12 is constantly urged against the movable stop member 9 causing friction between the movable stop member 9 and the leading edge of the sheet material 12. As a result, the sheet material 12 is as a whole shifted laterally with respect to the conveying direction of the rollers 2, 2, when the movable stop member 9 is moved transversely toward the side of the positioning device where the second stop members 8, 8, are provided.

For this reason, there is no possibility of the sheet material 12 buckling or collapsing as in the cases of the conventional devices, and the sheet material 12 can be positioned correctly in the lateral and longitudinal directions.

In FIG. 3, there is illustrated in more detail a practical mechanism which operates to shift the movable stop member 9 transversely and to swing the same upwardly. The movable stop member 9 is supported by a shaft 9*a* journaled through the guiding members 11, and the shaft 9*a* may be shifted transversely by means of the hydraulic cylinder 10 connected to the shaft 9*a* through a member 9*b* and mounted on a pedestal 13, which is in turn supported by a pair of legs 14 in a plane spaced apart upwardly from the feeding plane of the sheet material 12. On the pedestal 13, another hydraulic cylinder 15 is mounted for swinging the movable stop member 9 upwardly around the shaft 9*a*. An output rod 15*a* of the cylinder 15 is pivotally coupled to a crank lever 9*c* rigidly connected to the shaft 9*a*.

In another embodiment of the present invention as illustrated in FIG. 4, wherein like members are designated by like reference numerals, a stopper belt 16 is provided instead of the above described movable stop member 9 in such a manner that one side span 16*a* of the stopper belt 16 is positioned laterally relative to the conveying direction of the sheet material 12. The stopper belt 16 is driven by a suitable driving means in a direction whereby the sheet material 12 is shifted laterally toward the stationary stop members 8, 8. Furthermore, the stopper belt 16 is so arranged that it may be retracted upwardly and advanced downwardly, whereby the sheet material 12 can be moved to a position suitable for the subsequent process step.

In this case also, the leasing edge of the sheet material 12 abuts one side span 16*a* of the stopper belt 16, and the whole of the sheet material 12 is shifted laterally to the stop members 8, 8, when the stopper belt 16 is driven in the arrow direction in FIG. 3. Accordingly, it is apparent that the sheet material can be placed in a correct position laterally and longitudinally as in the previous example shown in FIGS. 1 and 2.

We claim:

1. A method for positioning a sheet material which comprises conveying the sheet material on a plurality of continuously driven conveyor rollers, causing it to abut a stop member extending transversely at the forward end of and perpendicular to the conveying path of the sheet material, and shifting the stop member along the transverse direction so that the sheet material abutting the stop member is thereby displaced transversely toward another stop member extending along the conveying direction of the sheet material while the sheet material is supported on the conveyor rollers being driven continuously.

2. A device for positioning a sheet material comprising a plurality of conveyor rollers of minimized surface friction and adapted to convey the sheet material in one direction, a first stop member extending transversely at the forward end of and perpendicular to the conveying path and adapted to be movable in the transverse direction, the stop member being also retractable from the conveying path of the sheet material, and a second stop member provided stationarily along one side of the conveying path, whereby the sheet material is first caused to abut the first stop member and then shifted transversely to abut the second member.

3. A device as set forth in claim 2 wherein said first stop member is a planar member driven by a hydraulic cylinder.

4. A device as set forth in claim 3 wherein said first stop member is further made liftable upward around a pivotal point located above the stop member.

5. A device as set forth in claim 2 wherein said first stop member is constructed in the form of a belt, one side span of which is positioned transversely relative to the conveying direction of the sheet material.

6. A device as set forth in claim 5 wherein said first stop member is made retractable from the conveying path of the sheet material.

7. A device as set forth in claim 2 wherein said second stop member is constructed in the form of a plurality of upright members disposed alternately between adjacent pairs of conveying rollers on one lateral side of the conveying rollers.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,713,647 Dated January 30, 1973

Inventor(s) MASANORI TAMURA ET AL

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

[30] Foreign Priority Data
Japanese Patent Application No. 11160/1971
filed March 3, 1971

Signed and sealed this 23rd day of April 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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