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Tongue and groove board with spacers permitting expansion

It is known that, in the assembly of tongue and groove boards, an interspace of about 1—2 mm must be maintained between what would otherwise be abutting surfaces of adjacent boards, in order to allow for expansion due to swelling caused by humidity or by a rise in temperature, without buckling the assembly of the boards.

The US patent no. 3.987.599 discloses a tongue and groove board provided with a continuous rib or projection at the bottom of each groove, rib or projection which crushes during the swelling of the assembly to avoid the buckling thereof.

Since a relevant effort is required to crush said ribs or projections, the buckling of the assembly may sometime occur.

The tongue and groove board according to the present invention avoid said drawback.

Object of the present invention is a tongue and groove board having confronting surfaces when assembled with adjacent said boards, having on the bottom of the groove of each said board a rib formed out of the material of the board and permitting expansion of the adjacent board. The tongue and groove board is characterised in that a plurality of projections are formed out of said rib, said projections being spaced part at their bases in the direction of the length of the board and being of such low mechanical resistance to compression that an assembly of the boards will expand by compressing said projections rather than by buckling, the interval between bases of the projections being greater than the length of the projections in the direction of the length of the board, said intervals having been formed by compression of the material of the rib between the projections.

In accordance with a preferred embodiment of the invention said projections are of triangular cross sectional configuration.

The present invention solves therefore the problem of how to provide spacers between boards, without at the same time permitting the boards to buckle upon thermal expansion.

This is done, by making the spacers easily crushable. The problem, however, is how to make easily crushable spacers cheaply.

According to the invention it is done by using the material of the board itself, at the bottom of the groove, first forming a continuous rib, and then compressing most of the total length of that rib to leave a plurality of spaced projections. Having pre-crushed most of the rib, the distances between the projections will be greater than the length of the projections (of course measured lengthwise of the board).

At first, it might seem like a mere matter of design, to provide a crushable spacer. Even the concept of providing something in the tongue-and-groove joint, which will be strong enough to space the boards apart under normal condi-

tions but will be weak enough to crush under thermal expansion without causing the boards to buckle, it might seem merely a matter of choice or design or simple engineering, to determine the total area of projection needed, and then to apportion that projection in any desired way.

But much more than that is involved. If as in the prior art US patent no. 3.987.599, a continuous rib is provided at the bottom of the groove, then the resulting projection will be too strong to be crushed. The projection can be weakened, by making it narrower. But according to the present invention it is dealing with boards, and a board cannot be quickly and economically milled or routed to very fine dimensions and to very delicate shapes. Thus, making continuous rib narrower, so as to make it sufficiently crushable while maintaining the desired height thereof, then it has to perform a very delicate woodworking job in order not to rip off the projection altogether while attempting to form it.

But according to the present invention, it can make the continuous rib quite sturdy, and hence easily produced by ordinary woodworking operations, and then imparting to it the necessary crushing characteristics, by pre-crushing most of it, leaving spaced, uncrushed projections at a distance from each other greater than their length along the length of the board. This pre-crushing operation can of course easily be accomplished by a simple rotary tool, and does not add excessively to the cost of production.

None of the known prior art nor any proper combination thereof has the least concept of this arrangement.

These and other objects, features and advantages of the present invention will become apparent from a consideration of the following description, taken in connection with the accompanying drawing, in which:

Figure 1 is a cross-sectional view of a known type of tongue and groove board;

Figure 2 is a cross section of a board according to the present invention, at an intermediate stage of manufacture, that is, having a rib at the bottom of the groove;

Figure 3 is a cross-sectional view taken on the line III—III of Figure 2, and showing the completed board according to the present invention, that is, having spaced projections at the bottom of the groove;

Figure 4 is a fragmentary elevation view of the disc used to flatten spaced portions of the rib so as to obtain spaced projections at the bottom of the groove; and

Figure 5 is a plan view, with parts broken away, of an assembly of tongue and groove boards according to the present invention.

Referring now to the drawings in greater

detail, and first to Figure 1 thereof, there is shown a cross section of a board 1 of known type, generally of deal, commonly called "matchboard", having a groove 2 extending lengthwise thereof along one edge and a tongue 3 extending lengthwise thereof along the other edge of the board.

According to the present invention, as seen in Figure 2, groove 2 is deepened by means of a mill (not shown) modified for this purpose so as to form on the bottom 2' of the groove a continuous rib 4 which is preferably of triangular cross section.

Rib 4 is then flattened at spaced intervals with the disc 5 shown in Figure 4. Disc 5 has peripheral cavities 6, 6', 6'' but is otherwise of cylindrical cross-sectional configuration, these cavities being spaced apart by part cylindrical sections 5', 5'' which serve to compress rib 4 along the lines 8', 8'' shown in Figure 3, so as to leave projections 4', 4'', 4''' spaced apart from each other a distance greater than the length of the projections. In other words, most of rib 4 has been flattened by disc 5.

The assembly of the boards is shown in Figure 5. By assembling two boards 1, 1' like those shown in Figure 3, the tongue 3 of one board penetrates into the groove 2 of the other until the edge 3' of the tongue comes into contact with projections 4', 4'', etc. of the other board, the two boards 1 and 1' are automatically mutually spaced to provide a space 7 therebetween, that is, by a distance "d" which allows for expansion of the boards without causing buckling and without the need to use separate spacers during assembly of the boards.

Thus, when the boards expand, for example by swelling as a result of humidity or increase in temperature, the projections 4', 4'', etc. compress easily in view of their low mechanical resistance to compression, and space 7 closes.

From a consideration of the foregoing disclosure, therefore, it will be evident that the initially recited object of the present invention has been achieved.

Although the present invention has been described and illustrated in connection with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the scope of the invention as defined in the appended claims, as those skilled in this art will readily understand. For example, the boards of the present invention can be not only of wood, but also of composites such as particle board or chip board or the like.

Claims

1. A tongue and groove board having confronting surfaces when assembled with adjacent said boards (1, 1'), having on the bottom (2') of the groove (4) of each said board a rib formed out of the material of the board (1,

1') and permitting expansion of the adjacent board, characterised in that a plurality of projections (4', 4'', 4''') are formed out of said rib, said projections (4', 4'', 4''') being spaced apart at their bases in the direction of the length of the board (1, 1') and being of such low mechanical resistance to compression that an assembly of the board (1, 1') will expand by compressing said projections (4', 4'', 4''') rather than by buckling, the interval between bases of the projections (4', 4'', 4''') being greater than the length of the projections in the direction of the length of the board (1, 1'), said intervals having been formed by compression of the material of the rib between the projections (4', 4'', 4''').

2. A board as claimed in claim 1, in which said projections (4', 4'', 4''') are of triangular cross-sectional configuration.

Revendications

1. Panneau à languette et rainure ayant des surfaces en regard de surfaces correspondantes lors de son assemblage avec des panneaux adjacents similaires (1, 1') ayant, au fond (2') de la rainure (4) de chacun desdits panneaux, une nervure formée à partir de la matière du panneau (1, 1') et permettant l'expansion du panneau adjacent, caractérisé en ce qu'une pluralité de saillies (4', 4'', 4''') est formée à partir de ladite nervure, lesdites saillies (4', 4'', 4''') étant écartées les unes des autres à leurs bases dans la direction de la longueur du panneau (1, 1') et étant d'une résistance mécanique à la compression assez faible pour qu'un assemblage des panneaux (1, 1') se dilate en comprimant lesdites saillies (4', 4'', 4''') plutôt qu'en provoquant un gauchissement, l'intervalle entre les bases des saillies (4', 4'', 4''') étant supérieur à la longueur des saillies dans la direction de la longueur du panneau (1, 1'), lesdits intervalles ayant été formés par compression de la matière de la nervure entre les saillies (4', 4'', 4''').

2. Panneau selon la revendication 1, dans lequel lesdites saillies (4', 4'', 4''') sont de configuration transversale triangulaire.

Patentansprüche

1. Brett mit Nut und Feder, welches im verbauten Zustand benachbarten Brettern (1, 1') gegenüberstehende Flächen aufweist, wobei am Grund (2') der Nut (2) jedes Brettes (1, 1') eine aus dem Material desselben geformte, eine Dilatation des benachbarten Brettes zulassende Rippe vorgesehen ist dadurch gekennzeichnet, daß aus der Rippe eine Mehrzahl von Vorsprüngen (4', 4'', 4''') geformt ist, welche in Längsrichtung des Brettes (1, 1') mit ihren Grundflächen in Abständen voneinander liegen und einen derart geringen Widerstand gegen Zusammendrücken aufweisen, daß eine Dilatation zusammengebauter Bretter (1, 1') ein Zusammendrücken der Vorsprünge (4', 4'',

4'''), aber kein Werfen der Bretter verursacht, daß der Zwischenraum zwischen den Grundflächen der Vorsprünge (4', 4'', 4''') größer ist als die Länge jedes Vorsprunges in Längsrichtung des Brettes (1, 1') und daß die Zwischenräume durch Zusammendrücken des

Materials der Rippe zwischen den Vorsprüngen (4', 4'', 4''') gebildet sind.

5 2. Brett nach Anspruch 1, bei welchem die Vorsprünge (4', 4'', 4''') dreieckigen Querschnitt aufweisen.

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