United States Patent

Roth

[15] **3,692,340**

[45] **Sept. 19, 1972**

[54] **FINGER JOINT FOR JOINTING BOARDS, BATTENS, PLANKS, AND OTHER COMPARABLE BODIES**

[72] Inventor: **Ahti Aadolf Roth,** Runonlaulajatie 50, Helsinki 42, Finland

[22] Filed: **April 9, 1970**

[21] Appl. No.: **26,870**

[52] **U.S. Cl.**.....**287/20.92 T,** 52/726, 161/111

[51] **Int. Cl.**.....**F16b 7/00**

[58] **Field of Search**....287/20.92 T; 161/37, 48, 111; 156/355, 304, 159, 49, 270, 250, 230; 144/309 L; 52/726, 593

[56] **References Cited**

UNITED STATES PATENTS

3,480,054	11/1969	Marian	287/20.92 T
2,297,353	9/1942	Goss et al.	287/20.92 T
3,262,723	7/1966	Strickler	287/20.92 T

OTHER PUBLICATIONS

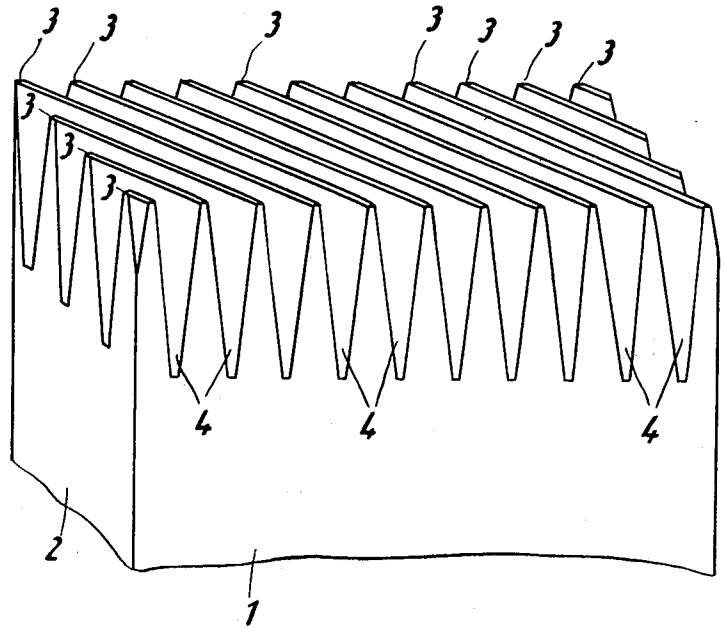
" End Joining of Wood by means of Finger Joints" By V. P. Pavlov, engineer, from a translation of an Russian article published by the U.S.S.R. Central Scientific Research Institute of Mechanical Woodworking. Forest Products Journal article " Improved Tips For Finger Joints" by D. B. Richards, pp. 250 & 251, published in June 1963.

Primary Examiner—David J. Williamowsky
Assistant Examiner—Wayne L. Shedd
Attorney—Woodling, Krost, Granger & Rust

[57] **ABSTRACT**

This invention relates to a novel finger joint for joining butt ends of timber, boards, planks and the like. Conventional finger joints have their fingers and notches extending transversely at right angles to two parallel side walls in the timber or plank. This means that at the juncture of a finger tip with a notch bottom that the effective glue surface is only equivalent to the width of the timer or plank. By making the fingers and notches diagonal to the two parallel side walls, the glue surface between contacting finger tips and notch bottoms is greatly increased thereby improving the strength characteristics of the jointed pieces.

4 Claims, 9 Drawing Figures



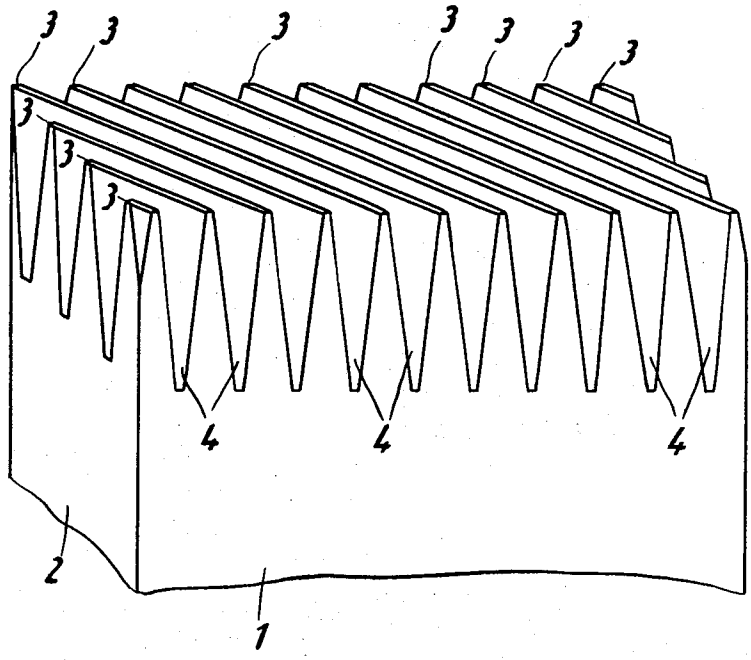


FIG. 1

Inventor:
Akti Adolf Roth
Woodling Krost Granger & Rust
Attys.

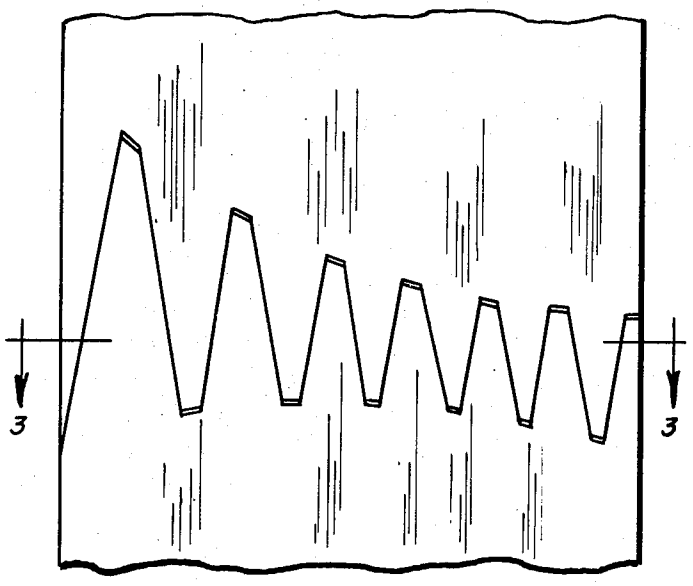


FIG. 2

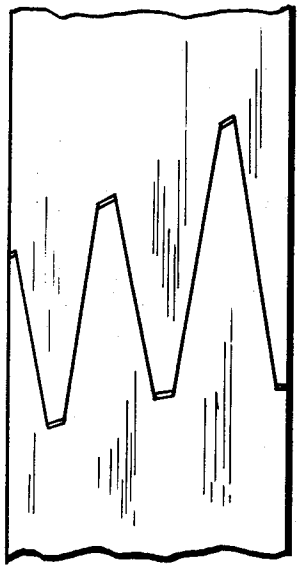


FIG. 4



FIG. 5



FIG. 3

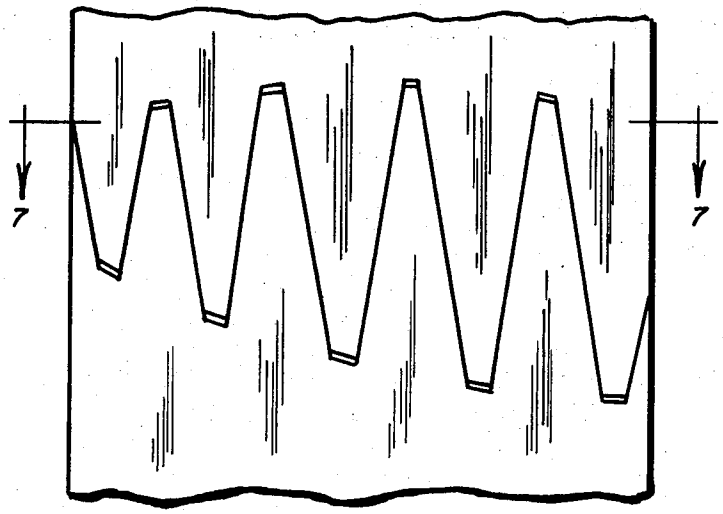


FIG. 6



FIG. 8



FIG. 9



FIG. 7

FINGER JOINT FOR JOINTING BOARDS, BATTENS, PLANKS, AND OTHER COMPARABLE BODIES

The present invention concerns a finger joint for jointing boards, battens, planks and other comparable bodies of wood, fibrous material deriving from wood, plastics or other comparable material, with another body by joining these together with the aid of the said finger joint, at which the fingers at the jointing end of both bodies are pressed into the corresponding notches between the fingers of the meeting body and are bound together by their side surfaces with the aid of glue.

In the joint structure sofar used in jointing bodies of the above-mentioned type the direction of the finger and the notches inbetween has been vertical relative to the plane of the side of the body, i.e. of the same direction as the plane of the adjacent side.

A finger joint structure of this kind, however, has certain disadvantages. In jointing construction timber gluing involves in addition to the usual end-to-end pressing also lateral pressing, which naturally retards the jointing work. On those sides of the body which are of the same direction as the fingers and the notches, a harmful notch bottom of the width of the side is formed between the finger tip and the notch bottom. In subjecting such a joint to normal strain, pull or bending, tension tops are formed at the extreme spots of the joint, due to which the joint is liable to break.

Thanks to the present invention the disadvantages mentioned are avoided and improvements are accomplished also in other respects.

The main characteristic feature of the finger joint according to the present invention is that the similarly directed fingers at the joint end of the bodies, and the notches inbetween, are running diagonally relative to the planes of the broad sides and the edges of the body.

The other characteristic features of the invention are defined in the patent claims 2–5.

FIG. 1 is a perspective view of the joint end of a timber made in accordance with the present invention;

FIG. 2 is an elevational view of a joint wherein the outermost fingers have a length greater than the length of the intermediate fingers;

FIG. 3 is a view taken generally along the line 3—3 of FIG. 2;

FIG. 4 is a view of FIG. 2 taken from the left side;

FIG. 5 is a view of FIG. 2 taken from the right side;

FIG. 6 is an elevational view of a joint wherein the intermediate fingers are longer than the outermost fingers;

FIG. 7 is a view taken generally along the line 7—7 of FIG. 6;

FIG. 8 is a view of FIG. 6 taken from the left side; and

FIG. 9 is a view of FIG. 6 taken from the right side.

In the drawing the symbol 1 means the broad side of the timber, e.g. the plank, and 2 the corresponding edge surface. A large number of notches 4 at equal distance from one another are made into the end of the plank, thus forming fingers 3 inbetween. The notches 4 opening from the end side of the plank narrow down in the direction of depth, whereas the fingers 3 between them widen correspondingly. The working of the notches 4, however, is carried out in such a way, that the direction of the notches and the fingers is at an angle of about 45° to the planes of the broad sides 1.

Said direction is also at equal angle to the planes of the edge surfaces 2.

In order to join the illustrated plank with another plank of the same size and shape of cross-section, the latter plank is provided at the jointing end with a corresponding number of notches and fingers of corresponding shape and size and in corresponding angular direction, locating of course in such position with respect to the notches and the fingers of the illustrated plank, that the fingers when the planks are brought end to end are guided into one another's notches on joining the planks together. Before jointing the notch and finger surfaces pressing against one another are coated with a suitable glue, upon which the final gluing together of the joined planks is carried out entirely by longitudinal end-to-end pressing and possibly under application of heat.

The invention offers the following advantages: no side pressing is needed in gluing. In the joint there is on no side surface of the body a notch bottom of the width of the side, so that in subjecting the joint to normal strain, pull or bending, tension tops are not formed by notch effect in the outermost spots of the joint. On this account the strength of the joint increases considerably, particularly in bending, compared to the joint previously used. The bending strength is almost the same as that of unjointed timber. In additional the distribution of the values of bending strength decreases to a marked degree. Due to these circumstances the permitted values of bending strength can be increased. The relative strength of the joint in bending is equally high on the broad side as on the edge, because the joint is similar in the direction of the board side and the edge. Because there is no butt joint on any side the joint on painting is not visible under the paint surface, and the timber can be planed just as unjointed timber. The joint displays estetic beauty, because the joint is similar in appearance both on broad sides and edges. Furthermore, the joint can be worked with convention machines making small changes.

Naturally the invention is not restricted only to that which is illustrated in the drawing and described above, but the modes of finger joint constructions according to the invention applicable in practical work may vary considerably within the scope of the invention from the construction presented in the drawing. Thus, for example, the shape of the cross-section of the fingers and the corresponding notches, their number and direction as well as the length of the fingers and correspondingly the depth of the notches may differ entirely from those presented in the drawing. Furthermore, the surface determined by the tips of the joints in the sections of the fingers and the corresponding notches in the direction of depth may run straight or diagonally. Likewise, part of the fingers and the corresponding notches at the jointing ends may be longer and deviate in shape from the other fingers including notches. The length of the outermost fingers, and correspondingly the depth of the notches inbetween, may be greater than the length of the intermediate fingers, and correspondingly the depth of the notches inbetween, or vice versa. Likewise the length of the fingers, and correspondingly the depth of the notches inbetween, may gradually increase or decrease towards the center.

I claim:

1. A finger joint for end joining first and second body members such as boards, battens, planks and other comparable materials including fibrous materials and synthetic resinous products, each said body member comprising a first pair of spaced and generally parallel sidewalls defining the width of the member and a second pair of spaced and generally parallel sidewalls transversely connecting said first pair of sidewalls and defining the thickness of the member, the cross section of each member comprising a quadrilateral shape, said joint comprising fingers on the end of said first body member pressed into corresponding notches between fingers on the end of said second body member, the medial planes of said fingers and notches on the end of each body member extending parallel to each other and diagonally relative to the planes of said first and second pair of sidewalls, some of said fingers and notches extending from one of said second pair of sidewalls to one of said first pair of sidewalls, some of said fingers and notches extending between the sidewalls of said first pair, some of said fingers and notches extending from the other of said first pair of sidewalls to the other of said second pair of sidewalls and none of said fingers and notches extending between the sidewalls of said second pair.

2. A finger joint as claimed in claim 1, characterized in that the directional angle of the medial planes of the fingers and their notches is in the range of from 10° to 80°, preferably about 45°, from the direction of the planes of the first pair of sidewalls, and correspondingly from the planes of the second pair of sidewalls, in the cross section of the body members.

3. A finger joint as claimed in claim 2, characterized in that the length of the outermost fingers in the length direction of the body members, and correspondingly the depth of the notches between the fingers, are greater than the length of the intermediate fingers, and correspondingly the depth of the notches between the fingers.

4. A finger joint as claimed in claim 2, characterized in that the length of the fingers in the length direction of the body members, and correspondingly the depth of the notches between the fingers, gradually increases toward the center.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,692,340 Dated September 19, 1972

Inventor(s) Ahti Aadolf Roth

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

On the cover sheet, insert -- [30] Foreign Priority Data Finland April 8, 1969 1004/69 -- .

Signed and sealed this 8th day of May 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.