Oct. 2, 1956 F. S. SILLARS 2,765,249

METHOD AND MACHINE FOR EDGE GLUING WOOD BOARDS

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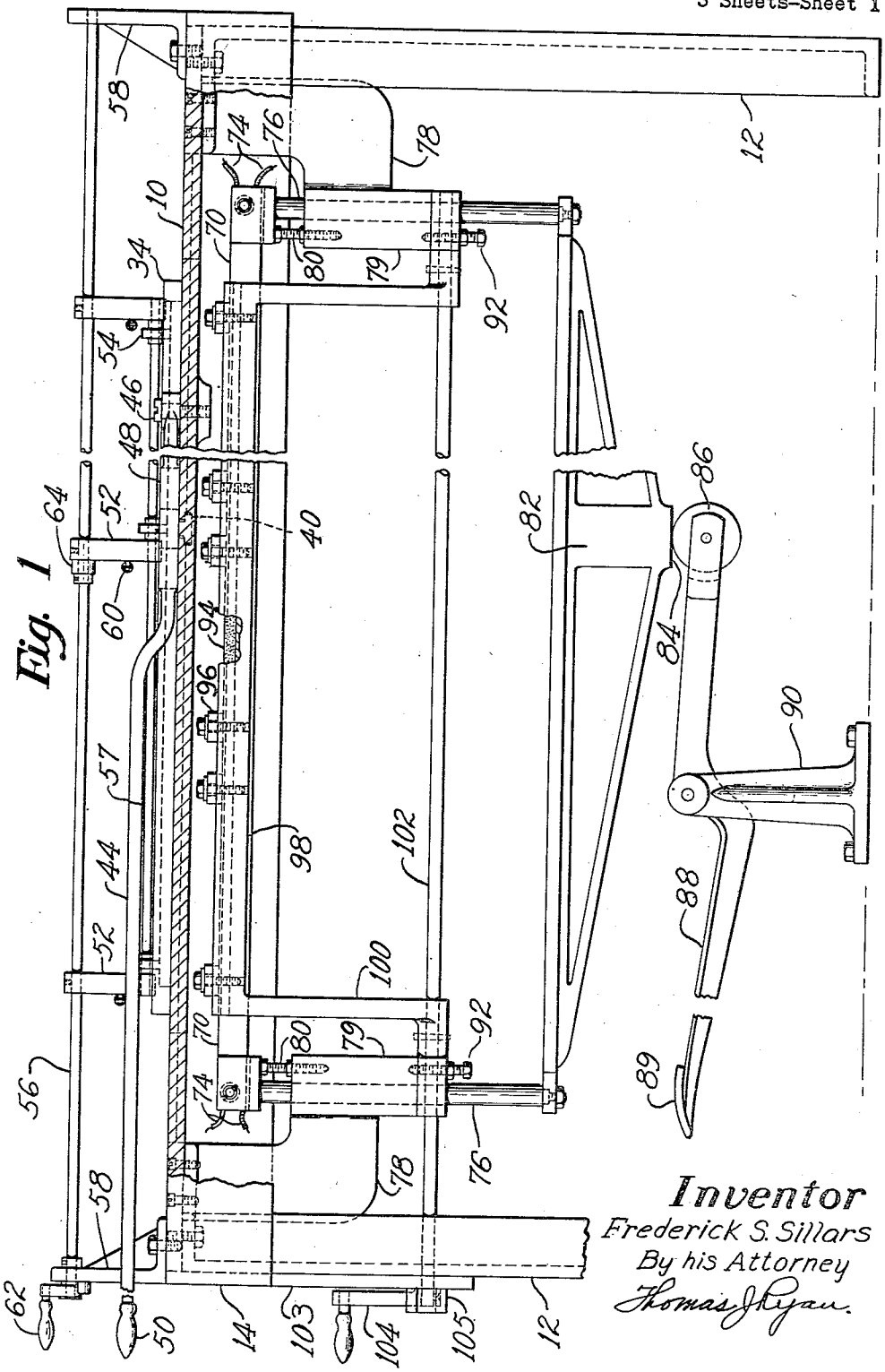
Fig. 1



Inventor
Frederick S. Sillars
By his Attorney
Thomas J. Ryan

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Fig. 2

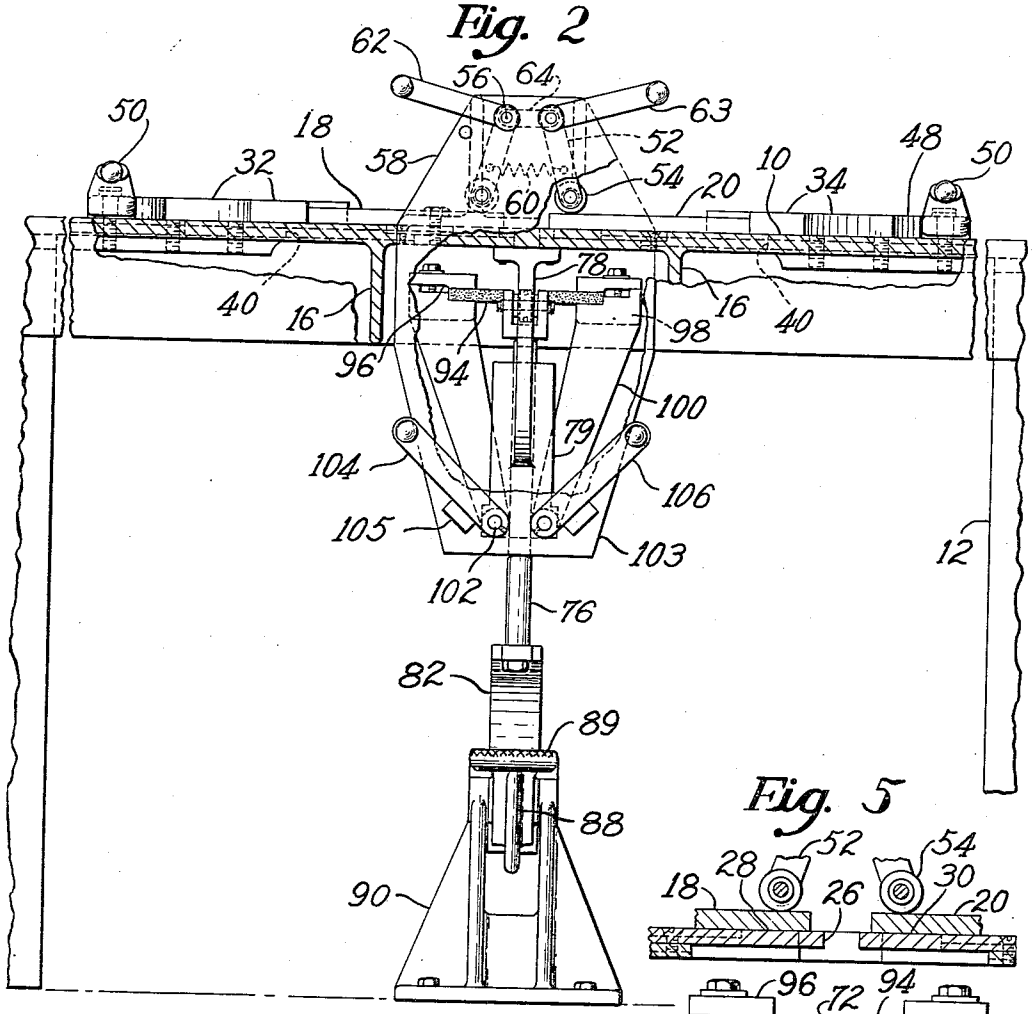

Fig. 5

Fig. 4

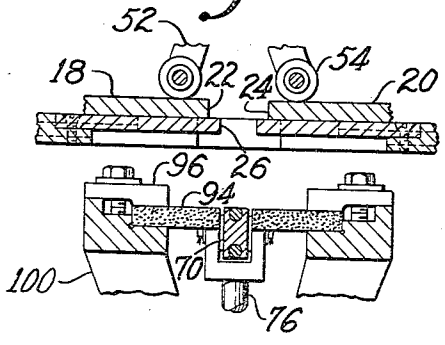

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Fig. 3

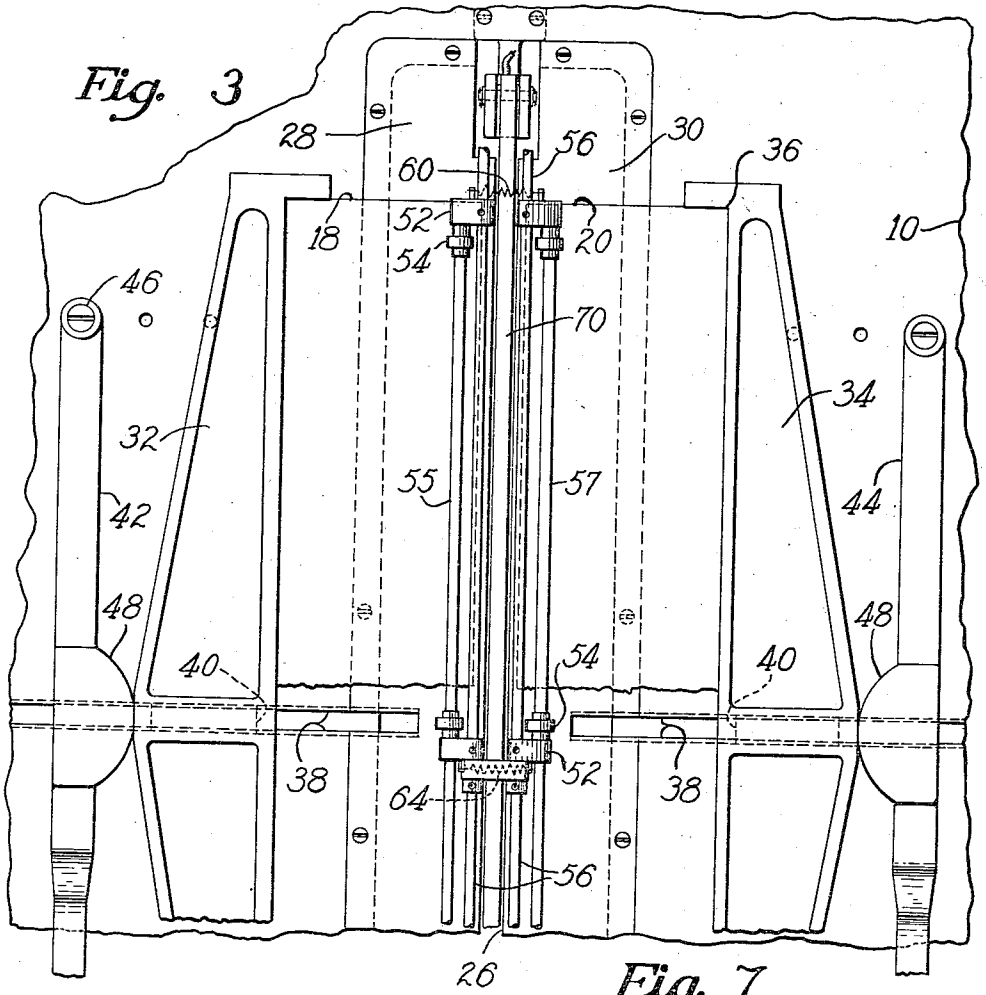


Fig. 6

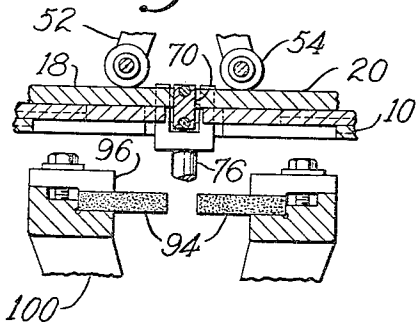
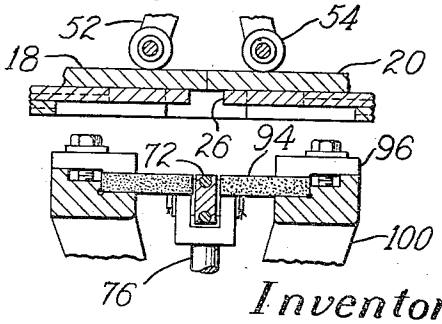


Fig. 7



Inventor

Frederick S. Sillars

By his Attorney

Thomas J. Ryan.

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METHOD AND MACHINE FOR EDGE GLUING WOOD BOARDS

Frederick S. Sillars, Beverly, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

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8 Claims. (Cl. 154—116)

This invention relates to edge gluing boards and is particularly concerned with the use of blocks of solid heat-softenable adhesive as the source of supply of a material to be used in making a bond between the boards.

In making a bond between the edges of boards to be joined to make a wide board, it is customary to employ a heated adhesive which is transferred to the edges of the boards just prior to the making of the joint. This, however, involves at least two difficulties. One is that it is frequently found desirable to heat the boards before the adhesive is applied in order to get a complete application of the adhesive to the material and penetration of the adhesive therein. When this is done, however, the work must be held under pressure for a considerable time in order to permit the dispersion of the heat and the forming of a strong joint.

Another difficulty resides in the deterioration of the adhesive material employed if the latter is heated in a receptacle and maintained at a sufficient temperature to keep it in liquid condition throughout the day's work. It is well understood that thermoplastic materials are desirable in the making of a strong bond but if such materials are kept in a heated receptacle there is great difficulty in cleaning away the surplus material and in preventing it from spoiling during use.

Accordingly, an important object of the invention is to devise an improved method of effecting bonds between the edges of sheets which involves the use of solid blocks of heat-softened material, small portions of which are transferred to the edges to be bonded.

Another object of the invention is to provide an improved apparatus for transferring the adhesive from solid blocks thereof directly to the edges of the work in a convenient and rapid fashion.

A heated blade may conveniently be employed for applying the adhesive to the edges of the work and in accordance with a feature of the invention, the blade is movable from a position where the adhesive blocks are brought into contact with the sides of the blade to a position where the adhesive is wiped onto the work. Provision is also made for supporting the blocks of adhesive for movement into and out of contact with the sides of the heated blade. This imparts only a small amount of heat to the work.

These and other features of the invention will best be understood from a consideration of the following specification taken in connection with the accompanying drawings.

In the drawings,

Fig. 1 is a side elevation of the apparatus with portions broken away and in section;

Fig. 2 is an end view from the left of Fig. 1 with a face plate broken away;

Fig. 3 is a plan view; and

Figs. 4, 5, 6 and 7 show successive steps in the use of the apparatus for carrying out the process.

In the apparatus shown, a table **10** is supported upon legs **12** and is strengthened by the use of marginal flanges

14 and depending webs **16**. This table is used for supporting pieces of work such as boards **18** and **20** having adjacent edges **22** and **24** (Fig. 4) which are to be adhesively bonded.

The table is provided with a central slot **26** which is defined by plates **28** and **30** screwed to the top of the table and having coplanar surfaces.

It will be understood that the boards to be joined are slidable toward and away from one another on the top of the table with the assistance of backers **32** and **34** which are angularly formed as at **36** to receive the boards. These backers are guided for rectilinear movement by undercut slots **38** (Fig. 3) in the top of the table receiving guide members **40**, in the form of an inverted T, which travel in the undercut slots **38** and are attached to the undersides of the backers **32** and **34**. To move the backers and to provide pressure against the boards after the adhesive has been applied, there are levers **42**, **44** which are pivoted to the top of the table, as by the screws **46** (Fig. 1), and these levers have curved projections **48** (Fig. 3) resting against adjacent portions of the backers. The levers have handles **50** enabling pressure to be applied manually.

To hold adjacent edges of the boards firmly against the table, a series of arms **52** having antifriction rolls **54** are mounted upon rods **56** which are pivotally supported in end brackets **58**. The rolls **54** are carried by shafts **55**, **57** passing through the lower ends of the pairs of arms **52** which are drawn together by associated springs **60** so as to hold the adjacent margins of the boards against the table. When it is desired to withdraw the rolls **54** from the pieces of work, this can be done by means of hand operated levers **62** and **63** clamped upon the respective rods **56**. A cross link **64** joining the long rather slender top rods **56** midway of their length helps to support them against bending.

The transfer of adhesive to the work is effected by means of a blade **70** extending lengthwise of the slot **26** in the table and provided with electric heating units **72** (Fig. 5) which may be controlled in any desired fashion and which are supplied with electrical energy through their terminals **74** (Fig. 1). This blade is supported upon pins in the forked upper ends of holders comprising rods **76** which are slidably mounted in depending hangers **78** secured at their upper ends to the bottom of the table. The lower end of each hanger is enlarged to provide a guide **79** for one of the rods **76**. Stop screws **80** are provided in these hangers to limit the downward movement of the blade and the rods **76** of the blade holder are joined by a connecting bar **82** having a bearing surface **84** on its underside for engagement by a roll **86** mounted upon the inner end of a lever **88** having a foot piece **89**. The lever **88** is pivotally supported in a forked member **90** attached to the floor and it enables the operator to lift the blade when desired to carry it above the level of the table as shown in Fig. 6. Additional depending stop screws **92** (Fig. 1) in the hangers coact with the upper side of the connecting bar **82** to limit the upward movement to a position where the blade is at the level of the boards which are to be joined.

Solid blocks **94** of heat softenable adhesive material substantially coextensive with the blade **70** are held by clamps **96** on the upper bars **98** (Fig. 1) of carriers having depending arms **100** which are pinned to one of the two shafts **102** journaled in the hangers **78**. At one end, these shafts **102** extend outward through a face plate **103** attached to the adjacent flange **14** and have hand levers **104** and **106** (Fig. 2). The levers **104**, **106**, in idle position, rest against stops **105** on the face plate **103** but when lifted swing the carriers **98** to move the blocks of adhesive into engagement with the sides of the heated blades **70**, as shown in Fig. 5.

In carrying out the method, boards **18** and **20** laid upon the top of the table are positioned in the angles **36** of the backers **32** and **34** and are held in firm contact with the table at their adjacent edges by means of the rolls **54** upon the spring-presed arms **52**. It will be understood that these boards are originally positioned with their adjacent edge faces **22** and **24** spaced from one another, as shown in Fig. 4. At this time the blade **70** is in its lowered position and by manipulating the hand levers **104**, **106** the blocks **94** of adhesive material may be brought into engagement with the side faces of the blade **70** (Fig. 5) so that the heat of the blade will melt a small portion of the blocks, causing the blade to become smeared with a thin layer of adhesive. The arms **104**, **106** are then released to permit the blocks of adhesive to fall away from the blade to the extent permitted by the stops **105** (Fig. 2). The operator will then depress the foot lever **88**, raising the blade to the position shown in Fig. 6, whereupon the levers **42**, **44** may be moved by grasping their handles **50** and moving them toward each other and the boards **18** and **20** will be moved against the blade, as shown in Fig. 6, to cause a transfer of the adhesive to the boards. The blade is then dropped to a position shown in Fig. 7 by a release of the foot lever **88** and the boards are immediately brought into contact by further pressure upon the levers **42**, **44**. It will be understood that the adhesive cools very quickly because of the small quantity employed and the fact that it has not been found necessary to apply heat to the boards themselves. Accordingly, after a short interval the hold-down arms **52** may be raised by the hand levers **62**, **63** and the backing members **32**, **34** pushed aside to permit the bonded boards to be lifted out of the machine.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a heated blade supported for movement in a predetermined path from a position in which a face thereof is contacted by a solid block of heat softenable adhesive material to a position in which the adhesive is transferred from the blade to a work piece, means for moving said solid block of heat-softenable adhesive material into contact with said blade, and means for moving the work piece into contact with the coated face of said blade to effect the transfer of the adhesive.

2. In combination, means for supporting pieces of work to be bonded for relative movements of approach, a heated transfer blade having exposed applying surfaces, means for effecting contact between said surfaces and solid elongated blocks of heat-softenable adhesive material, means for bringing together the work pieces and the coated blade for a transfer of the adhesive to the work, and means for withdrawing the blade.

3. In combination, coplanar supports for boards the adjacent edges of which are to be coated and bonded, a heated blade movable into spaced positions one of which is between said boards and the other of which is out of alinement therewith, and means for temporarily bringing into contact with opposed faces of said blade solid blocks of heat-softenable adhesive material to coat said faces for transfer of the material to the boards.

4. In combination, a table having a central slot, said table providing a support for boards to be joined at their adjacent edges, a heated blade, means for moving said blade from a position beneath the table to a position above the table, a movable support beneath the table for a block of heat-softenable adhesive material, means for moving the support for said block to bring the block into contact with a side surface of said heated blade when the blade is in a position beneath the table whereby said blade may serve to transfer the adhesive to the edge of a board.

5. In combination, a table provided with a central slot, said table serving to support boards which are to be joined at their adjacent edges, hangers beneath said table, swinging carriers on said hangers provided with clamps for blocks of solid heat-softenable adhesive material, a heated blade adapted to be moved upwardly through said slot, guides on said hangers, blade holders slidably mounted in said guides, means for swinging said carriers to bring said blocks against the sides of said blade when the latter is in a lowered position, means for raising said blade to a position above the table, and means for moving said boards into contact with the blade to transfer the adhesive thereon to the edges of the boards whereby the blade may be lowered and the boards brought into contact with one another to make an adhesive bond.

6. In combination, a table provided with a slot, vertical guides, a heated blade beneath said slot, vertically slidable supports for said blade movable in said guides, means for reciprocating said slides to carry the blade above the surface of the table, carriers for blocks of solid heat-softenable material substantially coextensive with the blade, means for moving said carriers toward and away from the blade, means for yieldably holding the adjacent margins of boards to be joined against the top of the table, and means for sliding said boards first toward the blade and later toward one another in order that adhesive removed from the blade may be utilized to make a bond between the boards.

7. The process of edge bonding sheets of material which consists in placing said sheets in a plane with their edge faces spaced from one another, pressing blocks of adhesive material against the side faces of a transfer blade, moving that blade to a position between the sheets to be joined, pressing the edges of said sheets against the blade, withdrawing the blade, and pressing the edges of the sheets together.

8. The process of edge gluing boards which consists in placing said boards in a plane with their edge faces spaced from one another, moving blocks of adhesive material into engagement with the side faces of a heated blade, withdrawing the blocks and moving the blade normally to said plane to a position between the boards, moving the boards against the blade to transfer the adhesive, withdrawing the blade, and pressing the boards together.

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