Sept. 28, 1943. J. A. MILLER 2,330,371

METHOD OF PRODUCING FORMS FOR MOLDING VENEER

Original Filed Aug. 31, 1940

FIG. 1

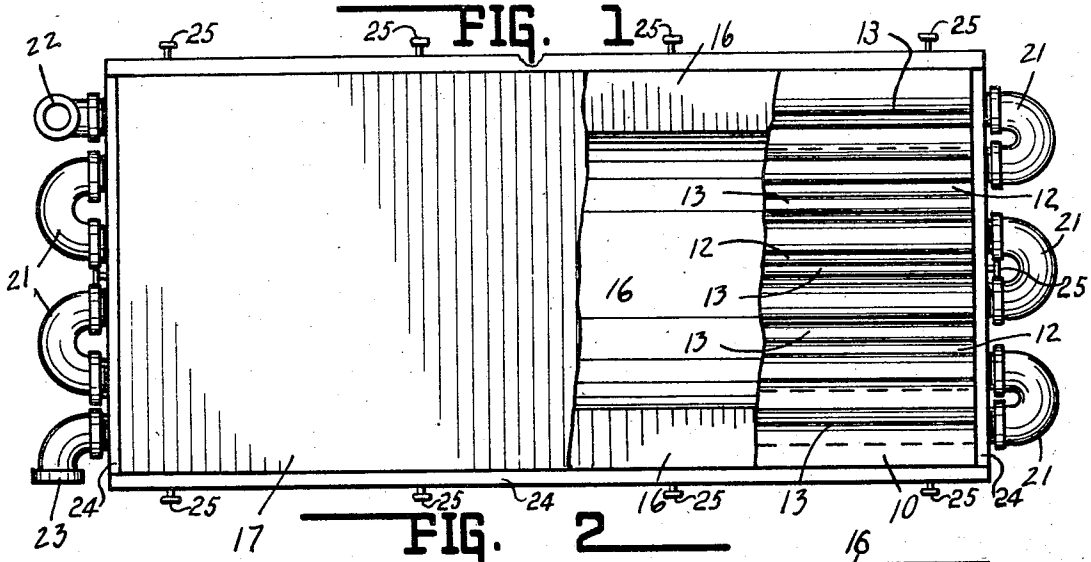


FIG. 2

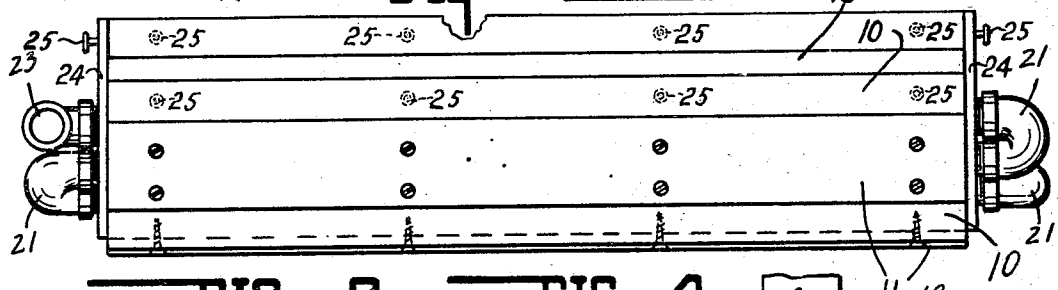


FIG. 3

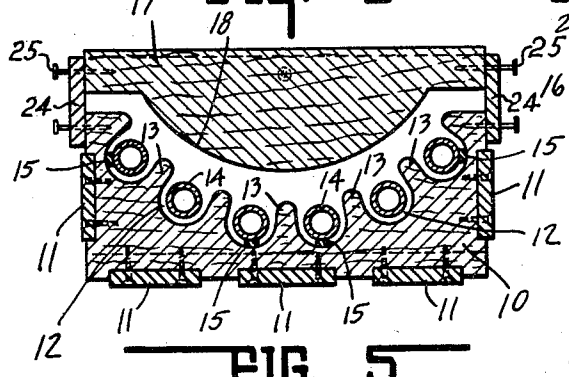


FIG. 4

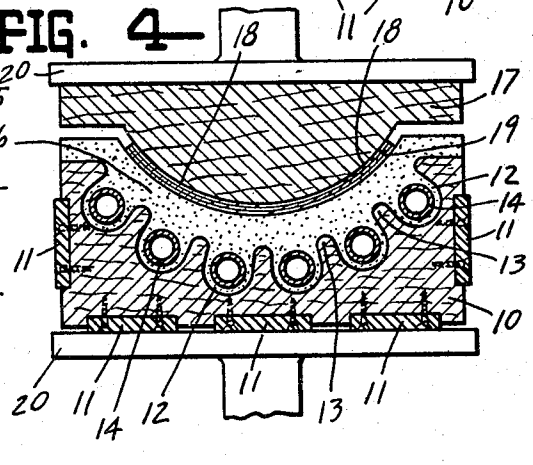
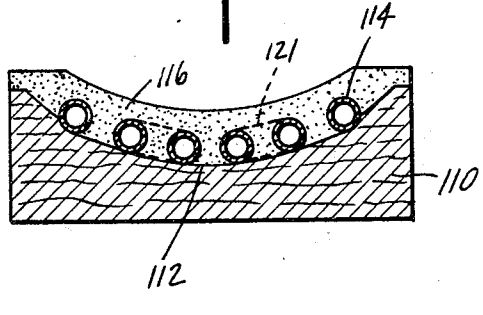


FIG. 5



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METHOD OF PRODUCING FORMS FOR MOLDING VENEER

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Original application August 31, 1940, Serial No. 354,972. Divided and this application March 21, 1942, Serial No. 435,668

8 Claims. (Cl. 22—202)

This invention relates to the method of making a heated mold form which is particularly adapted for use as a die in forming, pressing and heating plywood veneering and setting the same to the desired curvature, being a division of application Serial No. 354,972, filed August 31, 1940, now Patent No. 2,311,561, granted February 16, 1943.

The principal purpose of the invention is to provide such a form as may be of simple, cheap construction so as to eliminate the necessity of providing the usual expensive metal dies or forms commonly used.

By means of the present invention, wherein it is desired to form a curved panel of plywood, it is only necessary to rout out a caul from a block of wood to substantially the shape desired, place a series of steam pipes therein, and provide a male form from a block of wood having the prescribed convex curvature. The wooden male form is then placed over the female caul, the space surrounding the steam pipes and between their surfaces being filled with molten metal, such as babbitt. The molten metal thus surrounds the steam pipes and provides a forming surface for the female form of the prescribed curvature. The metal, being conductive of heat, readily transmits the heat from the steam pipes to the plywood for highly heating the same as it is pressed against the metal surface by the same wooden male form used in shaping such surface.

Other objects and features of the invention will be understood from the accompanying drawing and the following description and claims:

Fig. 1 is a plan view of the mold form with portions broken away to show the metal forming surface in one portion thereof and the heating pipes before the metal is applied, in another portion. Fig. 2 is a side elevation of the female form. Fig. 3 is a central vertical section through the male and female forms preparatory to introducing molten metal therein. Fig. 4 is a section similar to Fig. 3 through said forms to show them in plywood forming position. Fig. 5 is a central vertical section showing a modification of the female form.

In the drawing there is shown a wooden female caul 10 which is shaped from a solid or built-up block of wood. Said caul is reinforced by side and bottom plates 11. The upper surface thereof is routed out to provide a series of spaced recesses 12 with intermittent projections 13 extending longitudinally thereof. The recesses and projections are arranged generally in the configuration of a predetermined curvature to be reproduced in the plywood veneering.

Having thus formed the wooden caul, a series of interconnected steam pipes 14 are seated along the recesses 12 and are preferably blocked up with any suitable blocking pieces indicated at 15 so that said pipes may be temporarily supported substantially in spaced relation. A mass of molten metal 16 is then poured over the pipes so that the caul is practically filled therewith, and wherein it will flow into the recesses 12 and around said pipes. Such metal may preferably be babbitt or any similar metal which may be introduced in a molten state at sufficiently low temperature to avoid burning, as distinguished from perhaps merely charring, the wood caul into which it is introduced.

A wooden male form 17 having a convex curved surface 18 conforming to the prescribed curvature is placed over the molten metal so that said metal is pressed firmly about the steam pipes and excess metal is forced from between the caul and male form. The molten metal is then allowed to set and harden, conforming to the curvature of the male form, after which it is removed, with the result that the formed metal 16 has been given the proper curvature and is in contact with and surrounds the steam pipes so as to readily conduct heat therefrom to such curved surface.

In the above manner a female form capable of applying heat is produced in a simple and economical manner ready for use in shaping the plywood veneer. Thereupon a panel of plywood veneer 19 is placed on the metal surface of the female form, steam is introduced into the pipes 14 and the male form 17 is placed thereover. Pressure is thereupon applied to press and form the plywood through the medium of pressing plates 20 which may hydraulically or otherwise exert the desired pressure in the usual and well known manner.

As will be noted in Fig. 1, the steam pipes are connected in series at each of their ends by elbows 21, one of the pipes having a steam intake opening 22 and another a steam return or exhaust opening 23.

For temporarily retaining the molten metal within the female caul until it chills sufficiently to change from the fluid to the plastic state, a rough box 24 is provided to enclose the walls of the cover and extend upwardly therefrom. Said retaining box may be temporarily secured in place by nails 25, to enclose the sides and one or both ends, depending upon the manner of introducing the molten metal. The end panel or panels of the box may be grooved to roughly embrace the pipes 14 after they are in place, but a close fit is unnecessary since the metal soon chills and forms a heat conducting seal about the pipes exposed at the ends of the caul.

In Fig. 5 there is illustrated a modified and simplified form of female caul 111 which is provided with a bed having a curved surface 112 in which a series of steam pipes 114 are laid with their ends interconnecting through the elbows 121. The steam pipes being thus laid in the

caul, the molten metal 116 is poured thereover and formed in the manner above described to provide the desired female form.

Whereas the invention has been herein illustrated and described as applied to a form having the metal and steam pipes imbedded in the female member, it is obvious that it is equally applicable to a form wherein the metal and steam pipes are imbedded in and comprise the male member—or a mere reversal of the structure as herein shown and described.

The invention claimed is:

1. The method of producing a form for shaping sheet material consisting in forming a recess in a block of wood of the same general contour as the shape desired to provide the female forming member, mounting a plurality of heating elements in the recess thereof in spaced relation, shaping a block of wood with a convex surface of the shape desired to provide the male forming member, pouring molten metal into the recess of the block of wood forming the female forming member to surround and cover said heating elements, and applying the convex surface of the male die member to the metal contained in the recess of the female die member while in a substantially fluid state to thereby provide a metallic forming and heating surface therein conforming to the male member.

2. The method of producing a form for shaping sheet material consisting in forming a recess in a block of wood of the same general contour as the shape desired to provide the female forming member, mounting a plurality of heating elements in the recess thereof in spaced relation, shaping a block of wood with a convex surface of the shape desired to provide the male forming member, mounting said male member over said female member with their corresponding convex and concave surfaces respectively in spaced relation, pouring molten metal therebetween to surround and cover said heating elements while in a substantially fluid state, and thereafter removing said male member upon cooling and hardening of said metal to thereby provide a metallic forming and heating surface in said female member.

3. The method of producing a form for shaping sheet material consisting in forming a recess in a block of wood of the same general contour as the shape desired to provide the female forming member, mounting a plurality of heating elements in the recess thereof in spaced relation, forming a block with a convex surface of the shape desired to provide the male forming member, pouring molten metal of low melting point into the recess of the block of wood forming the female member to surround and cover said heating elements, and applying the convex surface of the male member to thereby provide a metallic forming and heating surface therein of the desired curvature.

4. The method of producing a form for shaping sheet material consisting in forming a recess in a block of wood of the same general contour as the shape desired to provide a female forming member, mounting a series of steam pipes spaced from each other in the recess thereof, forming a block of wood with a convex surface of the shape desired to provide the male forming member, pouring molten metal into the recess of the block of wood forming the female member to surround and cover said pipes, and applying the convex surface of the male die member to the metal contained in the recess of the female member to thereby provide a metallic forming and heating surface therein of the desired curvature.

5. The method of producing a form for shaping sheet material consisting in forming the surface on a block of wood of the same general contour as the shape desired to provide a forming member, mounting a plurality of heating elements over said surface in spaced relation to each other, forming a mating block of wood with an opposed corresponding surface of the shape desired to provide a forming member, pouring molten metal of low melting point between said members to surround and cover said heating elements, and separating said members after the metal has become set about and over said heating elements to provide a heat conducting forming surface of the desired shape on said forming member.

6. The method of producing a form for shaping sheet material consisting in forming a recess in a block of wood of the same general contour as the shape desired to provide a forming member, mounting a plurality of heating elements in the recess of said member in spaced relation, shaping a block of wood with a convex surface of corresponding shape to the said recess to simulate a male forming member, pouring molten metal into the recess of the block of wood comprising the forming member to surround and cover said heating elements, and applying the convex surface of said block to the metal contained in the recess of the forming member while in a substantially fluid state to thereby provide a metallic forming and heating surface therein conforming to said convex surface.

7. The method of producing a form for shaping sheet material consisting in forming a surface on a block of wood of the same general contour as the shape desired for providing a forming member, mounting a plurality of heating elements over said surface in spaced relation to each other, forming a mating block of wood with a surface of the said shape desired and associating it with the forming member with said surfaces opposed, pouring molten metal of low melting point about and over said heating elements to be formed thereabout and between said forming member and mating block, and separating said block from said member after the metal has become set about and over said heating elements and mating block to provide a heat conducting surface of the desired shape on said forming member.

8. The method of producing a form for shaping sheet material consisting in forming a recess in a block of wood of the same general contour as the shape desired to provide a forming member, mounting a plurality of heating elements in the recess of said member in spaced relation, shaping a block of wood with a convex surface of corresponding shape to the said recess to simulate a male forming member, pouring molten metal into the recess of the block of wood comprising the forming member to surround and cover said heating elements, and causing the convex surface of said block to form the metal contained in the recess of the forming member while in a substantially fluid state to thereby provide a metallic forming and heating surface therein conforming to said convex surface.

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