METHOD OF MANUFACTURING SOLID CORE FLUSH DOORS

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My invention relates to improvements in composite flush type doors, table tops and other panels, preferably of wood.

It is old to build solid core flush doors of the general character in question by assembling a core cemented together of a multiplicity of relatively small pieces of relatively inexpensive wood. Such cores are then cut to size, planed off to smoothness and veneers are attached to the opposite faces of the door to mask the built up glued solid door. In actual practice, it is difficult if not practically impossible commercially to glue a multiplicity of small pieces of wood together in such wise that a plane surface is presented for the application of the veneer. So in the past, it has been necessary after the core is glued up, to plane off one or more, perhaps both faces of the core before the veneer is applied and it is also necessary to plane off or cut to proper dimension one or more of the top, bottom and side edges. This makes it necessary to use up in the manufacture of the core much wood which must be cut away before the door is completed.

I propose a door or panel having top and bottom rails and stiles defining a frame which will receive the proper number of pieces of core wood. Each core piece will be separately machined to proper dimensions and the pieces will be assembled in the frame with a sufficient clearance between them so that they may be loosely assembled. They will be held in place by being separately glued to the front and back veneers which form the front and back faces of the door.

This avoids the necessity of first gluing together the core pieces to form a core, and cutting the core to proper dimension to fit into the frame. A substantial saving in labor and material results from the fact that after the pieces are glued together, it is not necessary to plane off from the face of the core to compensate for different core thicknesses, warping or lack of indexing. None of these difficulties take place when the individual pieces are properly sized, placed in the frame and separately cemented or glued to the veneers.

Other objects will appear from time to time throughout the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a side elevation of the door with parts cut away in its final, completed form;

Figure 2 is a door on an enlarged scale with veneer face removed showing the relationship between the adjacent core pieces;

Figure 3 is a section on an enlarged scale along the line 3—3 of Figure 1;

Figure 4 is a section through the work bench on which the door is assembled showing the door in process of assembly;

Figure 5 is a section along the line 5—5 of Figure 4.

Like parts are indicated by like characters throughout the specification and drawings.

Referring to Figure 1, the door has a top rail 1, a bottom rail 2 joined by stiles 3 and 4. A series of wood blocks 5 are held between the door frame formed of the parts 1, 2, 3 and 4 and the veneer, in this case, a three-ply veneer 6, is cemented to 1, 2, 3 and 4 and to the blocks 5, there being a veneer 7 on the other side of the door.

Referring to Figures 2 and 3, it will be noted that there is clearance between many if not all of the pieces and especially as at 8 between the longitudinally arranged lines of core pieces and staggered clearances at 9 between the core pieces in a single line, and that each core piece is separately glued to the veneer faces 6 and 7 as at 10 but the core pieces themselves are not glued together. The clearance between the core pieces is just sufficient for assembly, for example—we must have a door where the distance between the inner faces of the two stiles was twenty-six inches. The total width of the core pieces might be twenty-five and three-quarters inches or thereabout. Thus the quarter inch clearance 11 would be divided up among the number of the core forming pieces. The same situation would prevail with respect to the distance between the top and bottom rails. The importance of this clearance would appear when the method of assembling the door is considered.

Referring to Figures 4 and 5, 11 is a relatively thin table top carried by suitable legs 12. A conveyor 13 feeds a line of core pieces to the table. The core pieces in a line can vary with respect to length but must have their sides parallel and perpendicular to the top and bottom faces. The conveyor tends to feed such a strip into the table and by any suitable means when a strip of approximately the proper length has been fed onto the table, the saw 14 will cut the strip to right length just enough less than the distance between the top and bottom rails 1 and 2 so that it will fit with working clearance between them. The operator then moves the plate 15 across the table pressing the first strip against the member 16 which will form one of the stiles of the door. The plate 15 is moved back, another strip is fed out and cut to length and then moved against the first strip until a proper width of core is built up on the table against the member 16. The top and bottom rails are then attached to the member 16 across the opposed end of the core. Meanwhile, the lower veneer 17 is moved under the table 11, having first been glued so that the lower veneer is in register with the assembled core but separated therefrom by the thin veneer 18. Thereafter the veneer 17 traveling on the moving plate 18 will be moved in the direction of the arrows in Figure 4, at the same rate that the assembled core is moved so that as the two move together, successive rows of blocks drop onto the glued veneer 17 until the entire piece of veneer with the blocks resting on the glued face thereof rests on the table top 19. The other member 16' is then put in place. The top veneer is coated with glue and placed upon the assembly and the whole door including core, rails, stiles and veneer as at 20 are moved onto the compressor 21 where pressure is applied and the glue allowed to set. Thus no machining or sizing of the core takes place after assembly. Individual core blocks can easily be dimensioned so that they build up when assembled a core of proper size to fit the frame formed by the members which in the completed door are the rails and stiles. Movement of the core blocks with respect to one another may take place to compensate for slight changes in size or relative size of the blocks prior to the time when the glue is caused to set under pressure. Glue when wet is a sufficient lubricant to permit such relative adjustment of the blocks forming the core and the result is a core made up of properly sized blocks assembled in such wise that they can be cemented to the veneer without the necessity of any lateral pressure on blocks, stiles or rails.
and the clearance between the individual blocks is so slight that nails or screws can be used to attach molding or hardware or anything else desired, to the door.

As a modification of this method, the core pieces may be fed out and arranged in size and shape so as to provide a core to fill the door. Then the assembled core, the pieces all dry, are moved into register with the glued veneer either by longitudinal or transverse movement as the case may be or even the veneer might be applied to the upper surface of the core pieces. After that the rails and stiles may be applied defining and framing the core.

In assembly, since all the core pieces are loose and since there is clearance desired between them, it will happen that the pieces will not always be in absolute alignment, the clearance between adjacent pieces will vary. The point is that no matter how they are assembled, no matter with what care the assembly takes place, there will always be sufficient clearance at all points so that the individual blocks may register with one another and engage the front and rear faces of the door and be cemented or glued thereto so that the blocks themselves will not cause any deformation of the veneer or skins forming the front and back faces of the door. Those elements will be held in position parallel with one another as they engage the core.

I claim:

1. The method of manufacturing a solid core for flush doors and the like which consists in first sizing a multiplicity of core forming separate pieces to uniform thickness and width, feeding out a successive series of strings of such pieces abutting end to end, cutting each string off successively to the desired length for the length of the core, moving the strings sidewise, feeding out another string, cutting it off and moving it sidewise until a loosely assembled body of core forming pieces are assembled side by side and end to end of approximately the length and width desired, then framing the core with top and bottom rails and opposed stiles, gluing a veneer face to stiles, rails and core forming pieces, the core forming pieces being in loose contact with one another but glued to the door veneer, then gluing the opposite door veneer to the core, stiles and rails, holding the assembly under pressure until the glue has had time to set.

2. The method of assembling a door comprising first pre-sizing a multiplicity of separate blocks to uniform thickness and width, feeding such blocks out in a continuous string onto a plane work supporting zone, cutting off the string of blocks to predetermined total length, moving the string laterally, feeding out another string of such blocks and cutting off to predetermined length, continuing until a mass of blocks has been assembled of uniform length and thickness, the width of the assembly being approximately equal to the width of the core desired, then placing a veneer door face previously glued in register with the core, moving the assembly outwardly to cause individual blocks to drop into engagement with the glued veneer, applying the stiles and rails to the core in such wise that the blocks substantially fill the space with working clearance between the stiles and the rails, gluing the underside of the opposed door veneer, placing it on the stiles and blocks and then applying pressure to the assembly while the glue sets.

3. The method of building a door which comprises assembling in a horizontal plane, a plurality of separate blocks of uniform thickness and width in a plurality of parallel lines of equal length, placing a veneer door face, coated with adhesive, in register with the assembly of core blocks, immediately below but spaced from them with the glue face upward, then simultaneously moving the assembly of blocks and the veneer laterally, successively releasing the blocks, causing them to fall by gravity onto and rest upon the veneer face until all the blocks are supported by the veneer face, then simultaneously applying to the upper faces of all the blocks an adhesive coated door face and then compressing the assembly to cause the adhesive to set, whereby the blocks are each permanently attached to the opposed door faces.

4. The method of building a solid core for flush doors and the like which comprises feeding out a strip of filler blocks of uniform width and thickness but random length, severing the strip to predetermined over-all length, moving the loosely assembled strip of blocks laterally out of line with the line of approach of the strip and feeding out another strip of similar blocks and severing it to length, continuing this until an assembly of blocks of desired over-all width and length and uniform thickness exists, the blocks being loosely in contact with one another, placing under the assembly of blocks in registry therewith, spaced therefrom, a door face coated with adhesive on its upper side, the door face and block assembly being generally parallel and generally in horizontal planes, then simultaneously displacing the block assembly and the door face to cause successive lines of blocks to fall by gravity into engagement with the adhesive covered face until all the blocks rest upon the door face, then applying to the upper surface of the block assembly a similar coated door face with the cementitious coating between the block and the face and then applying pressure to cause the cementitious material to set to cement each individual block separately to the opposed faces.

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