Oct. 8, 1935. P. R. ZINSER 2,016,568

PROCESS OF FORMING COMPOSITION FIBER BOARD

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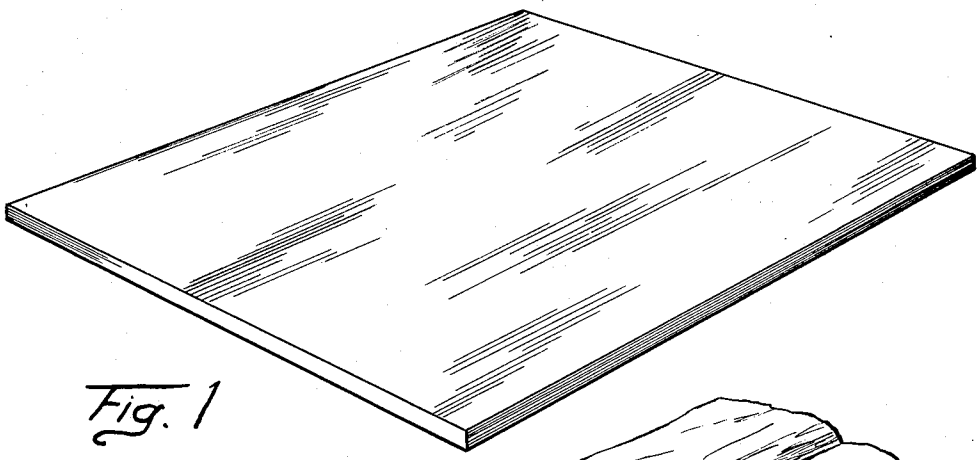

Fig. 1

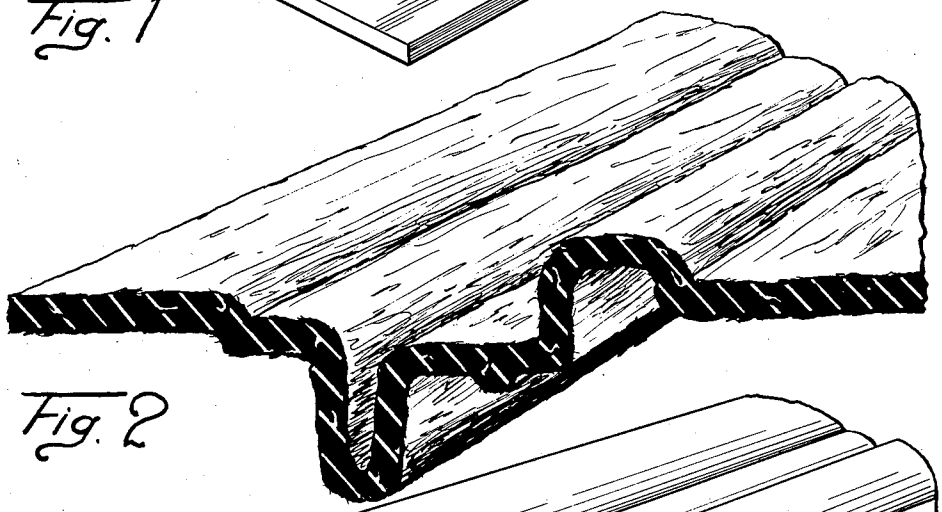

Fig. 2

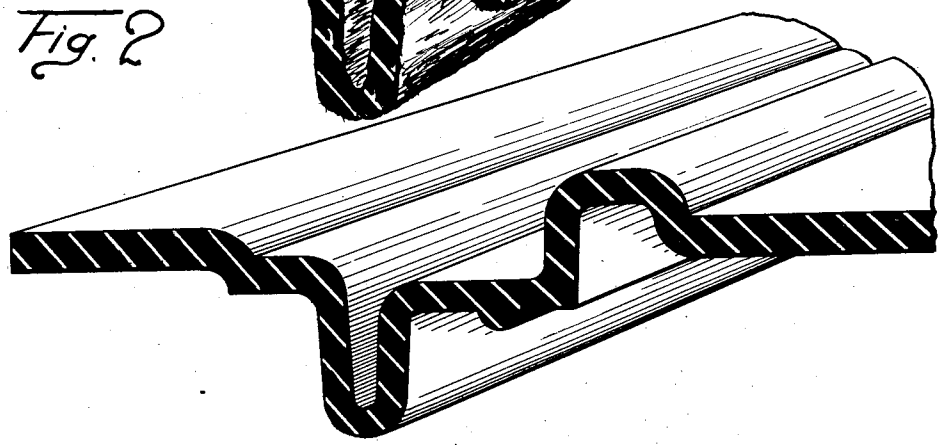

Fig. 3

INVENTOR.
Paul R. Zinser
BY Parker & Burton
ATTORNEYS.

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PROCESS OF FORMING COMPOSITION FIBER BOARD

Paul R. Zinser, Detroit, Mich., assignor to Woodall Industries Incorporated, Detroit, Mich., a corporation of Michigan

Application May 21, 1931, Serial No. 539,012

5 Claims. (Cl. 18—56)

My invention relates to an improved method or process of shaping or forming a composition fiber board composed of cellulose fibers held together by a suitable thermoplastic binder.

An object is to provide an improved process whereby sheet material of this character may be bent or shaped to a desired form quickly and cheaply and without breakage or rupture of the material and may be drawn to a substantial depth without producing breakage of material.

Another object is to provide such a process whereby this operation may be carried on quickly and inexpensively and whereby a smooth finished surface is produced on the article. A meritorious characteristic is that through employing this process the cellulose fibers are themselves rendered pliable and the binder is so responsive to the shaping force that it flows in such a manner as to permit of deep drawing, and the shaping operation is so carried out that the outer surface is given a finish which conceals and fills up any interior breakages that might occur.

Other objects and advantages of this invention will more fully appear from the following description, appended claims and accompanying drawing, wherein:

Fig. 1 is a view of a composition fiber board prior to treatment.

Fig. 2 is a view of the same board at an intermediate stage of the treatment.

Fig. 3 is a view of the same board at the completion of the process.

This process is adaptable for use with composition fiber board which possesses suitable thermoplastic characteristics and it is not my intention to limit it to any specific commercial product but I have found that it is peculiarly adapted for shaping a composition cellulose fiber board which is held together by a suitable asphalt binder and which is commercially known to the trade as KB board and which is a product that comprises cellulose fibers held together by an asphalt binder carrying a substantial clay content which renders the same usable on a paper-making machine in the fabrication of the KB product. This material varies as to its binder content but a product carrying forty per cent of binder is entirely suitable to carry out the proposed process. Obviously, the binder content may vary in proportion requiring merely modifications in the carrying out of the process.

The fiber board is preferably cut to size as in Fig. 1 and placed in a steam chest or cabinet where it is subjected to a steam pressure bath for a sufficient period of time to cause it to absorb moisture and to render it pliable and limp. The board carries initially a certain moisture content and this is added to in the steam chest. If we assume that the board has a forty per cent asphalt content and is three-eights of an inch thick, it will be found that it may have a moisture content initially of three to five per cent and after it has remained in the steam chest for thirty minutes this moisture content will have increased fifty per cent. Exposure to the steam bath for a longer period will cause the board to absorb more moisture within certain limits. A particularly wet board may contain moisture as high as nine per cent.

After the board has remained in the steam bath for the desired length of time it is removed and is now ready for the stamping operation. It will be found that the board is quite pliable and limp. The wood fibers which are held together by the binder, as well as the binder itself, are rendered pliable. The board is then placed in a suitable die stamping machine where the die is preferably heated to a temperature of approximately 180° Fahr. It is then stamped to its desired form. It does not remain in the die to set but is immediately removed and is allowed to cool to room temperature. It will frequently be found that the board, following this first stamping operation, has a fuzzy exterior surface probably due to protrusion of wood fiber ends and at times small cracks and breakages appear therein. Such a board, exaggerated as to appearance, is shown in Fig. 2.

After the board has cooled to room temperature and has taken a partial set, it is again placed in the same die and subjected to a second stamping operation. This second operation is carried on with the die at a substantially higher temperature than before. The die may have for this second operation a temperature of 280° Fahr. Upon removal of the board from the die following this second stamping operation it will be found that the exterior surface has been smoothed out and that the fuzzy appearance has disappeared and that any small breaks or crevices have been filled up and sealed and that the board possesses a smooth finished surface as shown in Fig. 3.

It has been found that by subjecting a board of this character to the treatment here outlined that it may be drawn to a substantial depth without breakage or rupture. It is believed that the binder flows in such a fashion as to permit the wood fibers to assume a different relative position in the stamping operation and that the

wood fibers themselves are deformable to facilitate such shaping and that the second stamping of the board seals the surface and gives it the finished appearance.

What I claim is:

1. That process of shaping a composition cellulose fiber thermoplastic board which includes subjecting the board to a steam bath for a length of time sufficient to render the board limp and pliable, stamping the board thus treated with a heated die to a desired form, removing the board from the die and allowing the same to cool, and stamping the board after the same has cooled with the same die but at a substantially higher temperature.

2. That process of shaping a composition cellulose fiber thermoplastic board which includes subjecting the board to a steam bath for a length of time sufficient to cause the board to absorb moisture to aggregate a moisture content of five to ten per cent by weight, stamping the board thus treated with a heated die to a desired form, removing the board from the die and allowing the same to cool, and after the same has cooled stamping it a second time in the same die but at a temperature substantially 100° Fahr. higher than before.

3. That process of shaping a composition fiber board carrying cellulose fibers held together by a thermoplastic binder comprising subjecting the board to a steam bath to render the cellulose fibers and binder pliable, stamping the board thus treated with a die heated to approximately 180° Fahr. to a desired form, removing the board from the die and allowing the same to partially set and then stamping the board a second time with the same die heated to a temperature of approximately 280° Fahr.

4. That process of shaping a composition fiber board comprising cellulose fibers held together by a thermoplastic binder which includes the steps of subjecting the board to a steam bath until the board has absorbed sufficient heat to render the binder plastic and sufficient moisture to render the cellulose fibers pliable and then stamping the board so treated in a heated die to the required shape.

5. That process of shaping a composition fiber board carrying cellulose fibers held together by a thermoplastic binder comprising heating the board to render it pliable, stamping and drawing the heated board with a heated die to a desired deformed shape, allowing the die shaped board to cool, and then subjecting the cool die shaped board to the same die stamping operation with the die heated to a temperature at which the binder will flow and substantially higher than the die temperature for the first operation.

PAUL R. ZINSER.