

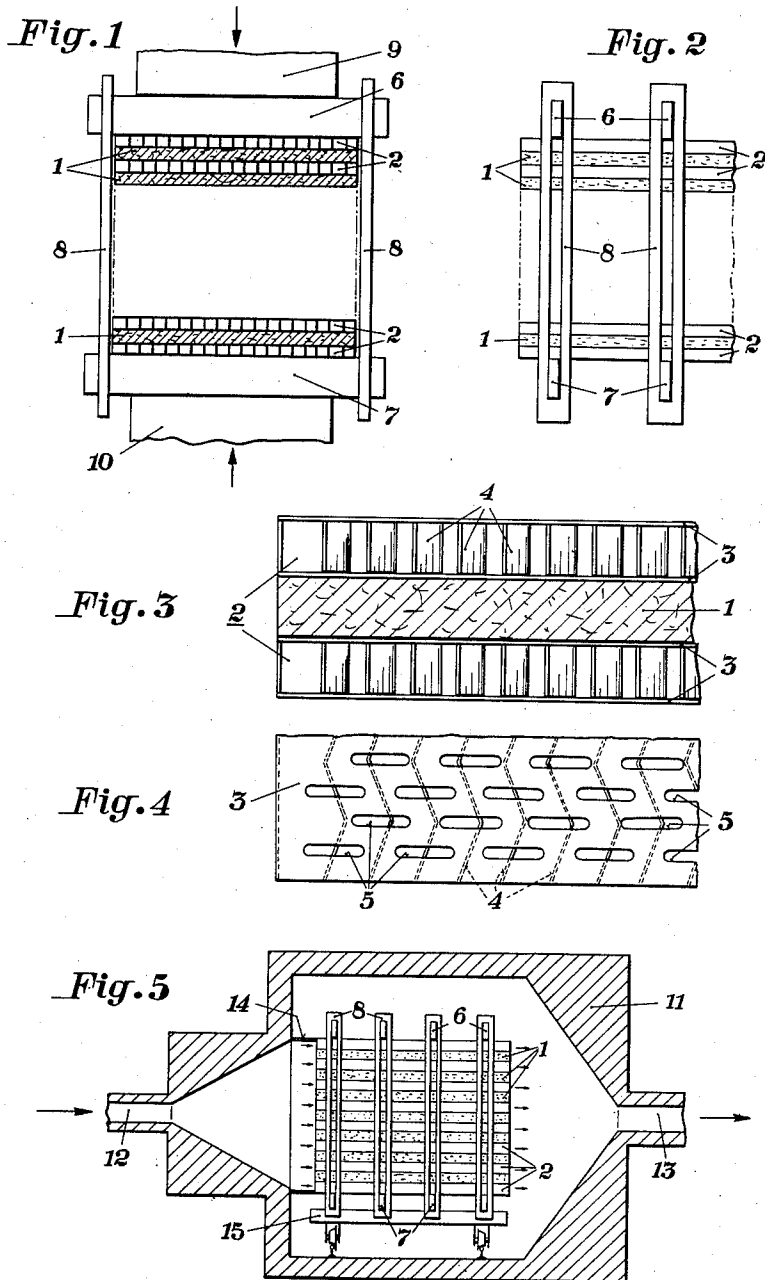
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PROCESS FOR PRODUCING SHAPED ARTICLES, PARTICULARLY PLATES

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PROCESS FOR PRODUCING SHAPED ARTICLES, PARTICULARLY PLATES

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The invention relates to a process and a device for producing shaped articles, particularly plates by pressing and heating water containing moulded materials. The latter may consist of organic fibrous materials, such as saw-dust or shavings and binding agent, such as artificial resin; the binding agent may also be obtained from wood material itself by treating the chips of wood in appropriate manner. The production of such shaped articles is generally carried out in hot presses which represent a particularly expensive part of the equipment and should be therefore utilized in the widest possible manner for economical reasons. If the moulded materials to be pressed have a relatively high water content, drying of the same in a hot press would be very uneconomical. In such a case water cannot be removed by pressure but only by evaporation. The latter, however, requires considerable time during which the press must be inactive.

According to the invention this drawback is eliminated in that the staple consisting of moulded material containing a relatively high water content is cold-pressed and after removing it from the press dried by heat supply. The time of pressing is thereby decreased to a minimum. Drying of the mass is effected outside of the press, so that the latter is prepared very soon to press a new staple. Preferably the staple is enclosed in the press in a gripping device in order to keep the staple under pressure also after removing it from the press during drying. For most effective and rapid drying the pressed and stapled moulded materials under pressure it is moreover advisable to put between the stapled moulded material not merely sheet metals, as usual, but also intermediate members having one or several passing channels through which a heating medium is guided in the drying step. By this means the moulded material is effectively heated within the staple.

The process according to the invention is particularly appropriate for producing middle hard, relatively porous plates with a specific gravity of about 700–800 kg./m.³. Such plates have a sufficient insulating action, but besides this also a higher strength over typical dam plates. Also such typical dam plates with a lower specific gravity may be produced according to the invention.

In the accompanying drawing the invention is illustrated for example by means of a device for producing plates.

Figs. 1 and 2 show a staple in front and side elevation, respectively.

Figs. 3 and 4 show a part of such a staple in an enlarged scale in cross-sectional view and top view, respectively.

Fig. 5 is a vertical section through the drying chamber.

It is assumed that plates are to be produced from a material consisting of about equal parts by weight of dry substance and of water. According to Figs. 1 and 2 moulds 1 consisting of this material are arranged alternatively with intermediate plates 2 to a staple one above the other. According to Figs. 3 and 4 each intermediate plate 2 consists of two spaced sheet-metals 3, connected with a series of parallel bridge elements 4 consisting of

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metal-sheet strips. The connection between the metal-sheets 3 and the strips 4 may be provided for example by spot-welding. This is facilitated by the fact that the metal-sheets 3 are provided with several openings, for example in the form of slots 5 through which the strips 4 protrude freely outside. As illustrated in Fig. 4 the strips 4 run zigzag or wave-like, the advantage of this is indicated in the following.

The topmost intermediate plate 2 of the staple is connected with a series of parallel supports 6, the ends of which extend at both sides over the staple. In the same manner the lowest intermediate plate 2 is also connected with a series of parallel lower supports 7. One pair of supports 6 and 7 each lying one above the other may be connected by a slotted frame 8 on its ends.

The staple of moulded material 1 and intermediate plates 2 arranged between the cross supports formed by the supports 6 and 7 are subjected without heat supply to a pressure of for example 30–50 atm. in a press which is indicated in Fig. 1 as an upper and lower press platen 9 and 10. The other parts of the press are known per se and therefore are not shown. Thereby a great part of the water content of the moulded material is removed and the thickness of the latter is considerably decreased. Thereupon the frames 8 are connected with the extended series of supports 6 and 7, so that the staple is kept under pressure after having been removed from the press. The cross supports 6, 7 and the frames 8 may be varied within the scope of the invention. The formation of a gripping device enclosing the staple after its removing from the press and enabling the staple to be kept under pressure during the subsequent heating process is of importance. The intermediate plates 2, having a total height, for example, of 20 mm., will withstand the necessary pressures and bending or breaking strains, since the pressure is transferred by several bridge elements 4. Moreover an effective stiffening of the strips against bending or breaking is available by the zigzag- or wave-form.

The staple is then transported on a carriage 15 into a drying chamber 11 provided with an inlet 12 and an outlet 13 for the heating medium. As heating medium hot air and hot waste- or flue-gases may be used. The staple is placed in the drying chamber in such a manner, that the channels formed between the strips 4 and the intermediate plates 2 run in the direction of the stream of the heating medium, i. e. from the left to the right in Fig. 5. A cap 14 adjusted to the periphery of the staple directs the entire stream of the heating medium through said channels. By this means the sheet-plates 3 and therefore also each individual mould 1 are intensively heated. The developed water vapour may escape not only at the rims of the plates, but also through the numerous slots 5. The zigzag- or wave-form of the strips 4 aids the heating, since the heating medium is brought into contact more intensively with the strips 4 in view of their wound path. The strips deliver their heat to the sheet-plates 3 and thereby to the material to be dried. The heating stream may also be circulated in a rotary fashion, as it is known per se in drying processes. While the drying is finished for example in about two hours, the pressing operation merely lasts a few minutes, so that the press may be charged with new staples within short intervals. After drying and removing the slotted frames 8 the staple is separated into individual plates ready for use.

I claim:

1. Process for the production of shaped articles comprising the steps of stacking molded articles of water-soaked fibrous material and spacing elements with draining channels in alternating relation between jaw members within a press, of cold-pressing the jaw members and the stack therebetween, of rigidly securing the jaw members to one another while clamping the stack in compressed

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condition, of removing the stack clamped by the jaw members from the press and of subjecting the articles under continuous compression in said stack to a heating medium circulated through said channels.

2. Process according to claim 1 and wherein the draining channels extend from one side of the stack to the other.

3. Process according to claim 1 and wherein the water-soaked fibrous material is of organic origin.

4. Process according to claim 1 and wherein the shaped articles are plates.

5. A process for the production of plates from water-containing moulded materials, comprising the steps; of stacking said plates each spaced with spacing elements in alternating relationship to provide parallel channels for heat circulation and water drainage; of compressing the stack thus produced in cold state between the platens of a press; of providing said stack while in said press under cold compression with means fixing and maintaining said compression independently of said press; of removing said compressed stack from said press in its compressed condition; and of exposing said stack under continuous compression to a stream of hot gases circulated through the said channels until the desired dryness of said plates is accomplished.

6. A process as claimed in claim 5, wherein said moulded materials comprise water-soaked organic fibers.

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7. A process as claimed in claim 5, wherein said step of spacing is accomplished by the use of spacing elements which are positioned in said stack prior to compression to provide during compression and heating drainage of moisture and during heating simultaneously conduits for circulating hot gases.

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