

[54] **DISCHARGE DEVICE FOR PLATEN PRESS**

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[58] Field of Search.....**18/16 E, 16 F, 16 H, 16 R, 18/16 P, 17 P, 17 J, 2 RM; 25/DIG. 16**

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[57] **ABSTRACT**

A horizontal frame, riding on fixed rails, can be slid into the gap between two separated press plates for removing a freshly pressed board with the aid of an extractor bar dropped behind the far edge of the board by the turning of a rotatable frame member. Two sets of bristles on the rotatable frame member come at the same time into contact with the upper and lower press plates to sweep their confronting surfaces upon the withdrawal of the frame. Retractable extensions at the ends of the extractor bar may serve for the withdrawal of spacing strips together with the board.

13 Claims, 4 Drawing Figures

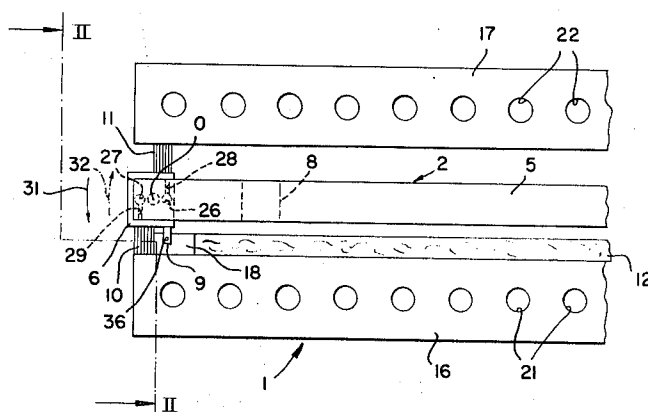


FIG. 1

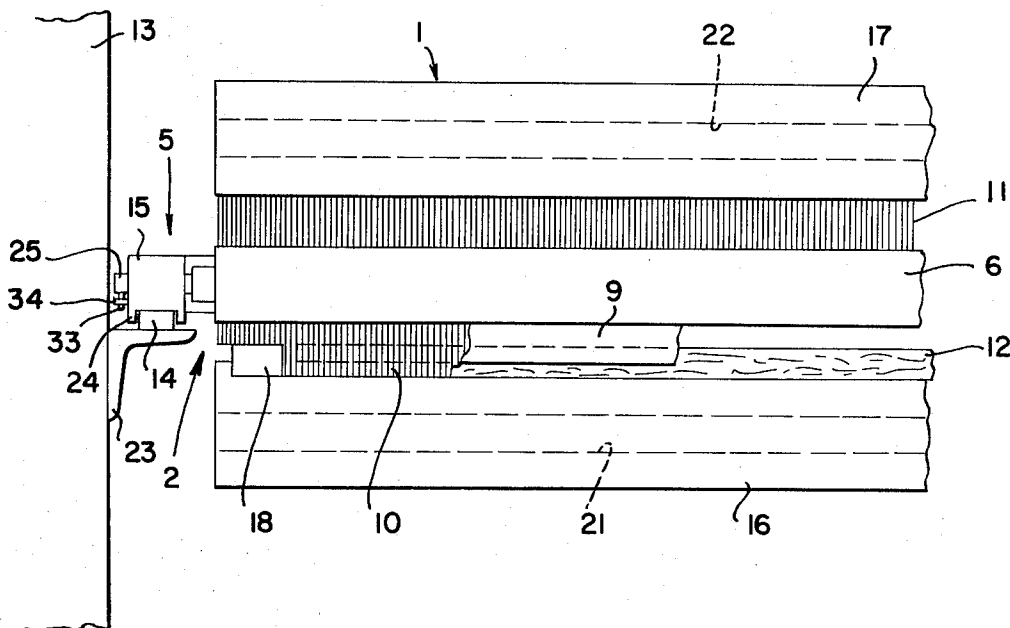
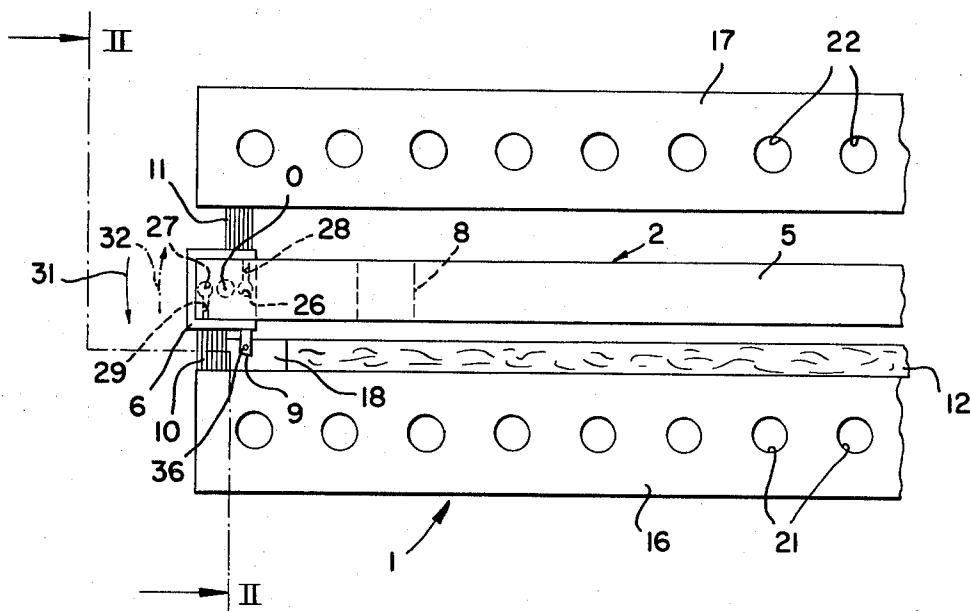
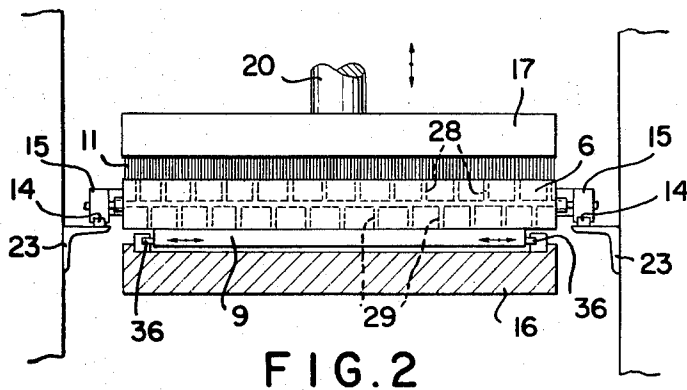
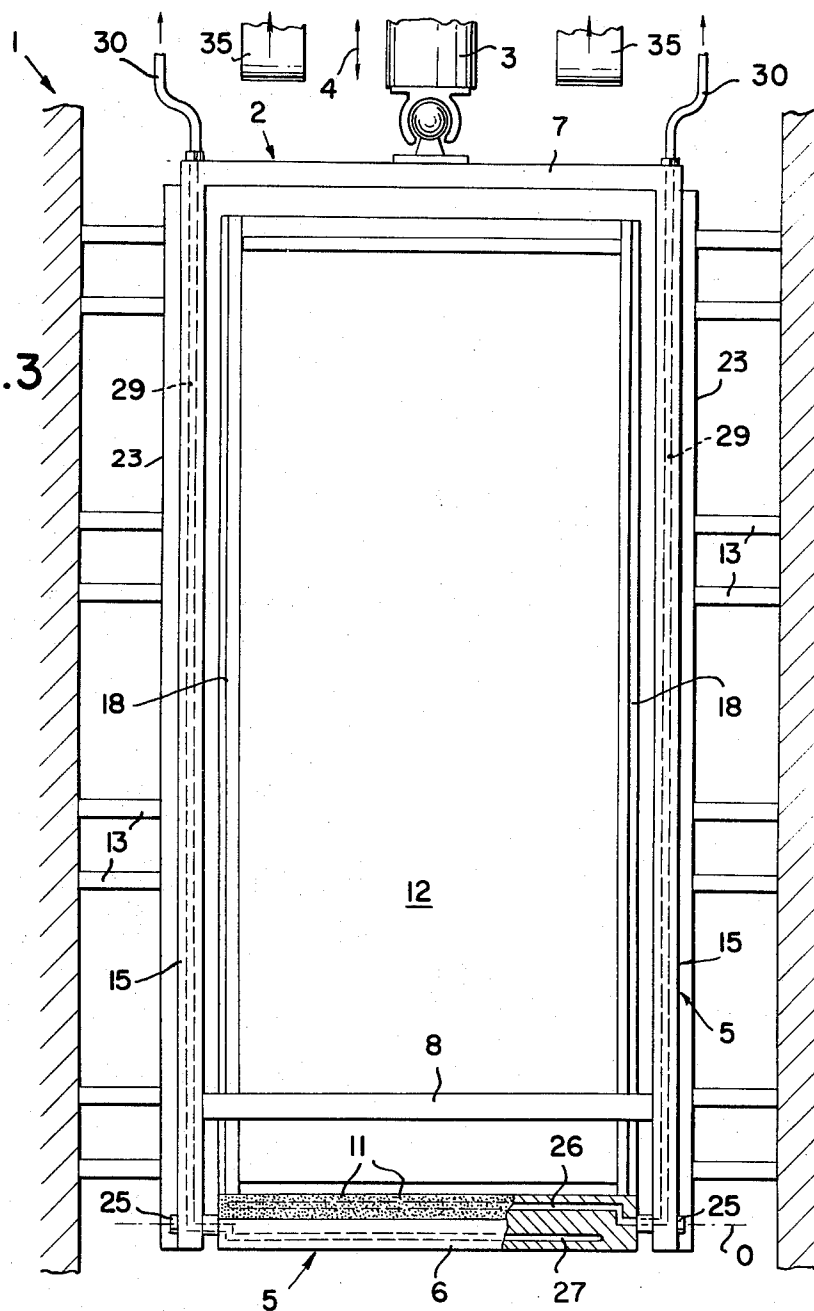


FIG. 4

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FIG. 3



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DISCHARGE DEVICE FOR PLATEN PRESS**FIELD OF THE INVENTION**

Our present invention relates to a platen press of one or more levels designed for the production of pressed boards, e.g. as disclosed in commonly owned U.S. Pat. No. 3,241,189.

BACKGROUND OF THE INVENTION

In such presses it is convenient to insert the particulate material to be pressed, i.e. chips, fibers or the like, from one side of the press frame into the working space between two plates and to remove the finished boards from either the same or the opposite side substantially concurrently with the insertion of a fresh pile. This insertion can be accomplished with the aid of rigid trays carrying the piles or, more advantageously, by means of so-called conveyor tablets or conveyor trays of the type described, for example, in commonly owned U.S. Pat. No. 3,428,505. The leading edge of the conveyor tablet may be used in such a case to eject the board previously formed.

A problem not infrequently encountered in such installations is the presence of loose chips or other fragments which, particularly in the case of unsupported boards, may adhere to one or both of the confronting plate surfaces separating after the formation of a board therebetween. If these stray fragments are sticky on account of being coated with a binder of the heatcurable type as used in the production of the boards, they cannot be dislodged from the plate surfaces by the simple expedient of blowing a stream of air onto the plates. When present in an area of the plate within the outline of the board, they will tend to mar the surfaces of boards pressed thereafter; if they happen to overlie a spacing strip inserted between the plates to control the thickness of the board, their presence will affect that thickness.

OBJECTS OF THE INVENTION

An important object of our present invention is to provide simple and reliable means for withdrawing a pressed board from the space between an upper and a lower platen, or more generally a pair of press plates, by means independent of a charging mechanism for the press though operable in synchronism with such mechanism.

Another object is to provide discharge means designed to clean the adjacent plate surfaces of chips and other fragments simultaneously with the withdrawal of a finished board.

A further object is to facilitate the removal of spacing strips, if desired, concurrently with such a board.

SUMMARY OF THE INVENTION

In accordance with this invention we provide fixed guide means, such as a pair of horizontal rails, on the press frame alongside the relatively movable upper and lower plates between which a board is formed, an extraction unit being reciprocable along these rails into the space between the separated plates and being provided with one or more abutments positionable beyond a remote edge of a previously pressed board, as seen from the side of insertion, for entraining that board upon withdrawal of the extraction unit to that side.

In a preferred embodiment, the extraction unit has two parallel arms between which a swivel member is supported for rotation about an axis paralleling the edge of the board to be engaged by the abutment. Thus, the extraction unit may have the shape of a rectangular frame with two of its sides defined by the parallel arms and a third side constituted by the swivel member.

In accordance with a further feature of our invention the swivel member carries at least one and preferably two sets of bristles for brushing the lower surface of the upper press plate and/or the upper surface of the lower press plate during the withdrawal stroke, these bristles coming into contact with their respective plate surface concurrently with the dropping of the abutment behind the board edge. During withdrawal, any fragments detached from the upper plate by the upwardly directed bristles will fall into the path of the downwardly directed bristles for removal from the working space. It is also possible, pursuant to still another feature of the invention, to provide this swivel member with a channel system extending to a suction pump or the like for exhausting the fragments swept up by the brushes.

In order to minimize the stress exerted by the extracting abutment upon the engaged edge of the newly formed board, we prefer to let this abutment extend over substantially the full length of that edge, as by giving it the shape of a blade depending from the swivel member. The ends of this blade may be provided with retractable extensions designed, when in their projecting position, to engage a pair of spacing strips flanking the entrained board so as to remove these strips together with that board from the lower press plate.

DESCRIPTION OF THE DRAWING

The above and other features of our invention will be described in detail hereinafter with reference to the accompanying drawing in which:

FIG. 1 is a fragmentary side-elevational view of a pair of press platens and an associated extraction unit according to the invention inserted therebetween;

FIG. 2 is an end view, partly in section, taken on the line II — II of FIG. 1 but drawn to a smaller scale;

FIG. 3 is a top view of the assembly of FIGS. 1 and 2 with the upper press platen removed; and

FIG. 4 is a fragmentary end view, similar to FIG. 2, with parts broken away and drawn to the same scale as FIG. 1.

SPECIFIC DESCRIPTION

The press shown in the drawing, generally designated 1, comprises a lower platen 16 and an upper platen 17 which are relatively movable to compress a pile of chips, filaments and the like, together with a resinous binder, into a board 12 of predetermined dimensions. For the curing of the binder, the platens are provided with conventional heating means diagrammatically illustrated in FIG. 1 as channels 21 and 22 for the passage of a hot fluid. The lower platen 16 may be considered rigid with the press bed whereas the upper platen 17 is reciprocably suspended from a ram 20.

The press frame includes a set of vertical ribs 13 supporting a pair of horizontal shelves 23 which extend parallel to each other in the direction of the major sides of board 12, the press being provided with conven-

tional means not shown for introducing a pile of particulate material into the space between the platens, e.g. from the left as viewed in FIG. 3. On the right side of the platens there is provided a drive mechanism, diagrammatically represented by a piston 3, for reciprocating an extractor, generally designated 5, as symbolized by an arrow 4. Extractor 5 comprises a frame 2 defined by a pair of longitudinally extending arms 15, a cross-bar 7 spanning these arms at the end of the frame proximal to piston 3, and another such cross-bar 8 remote from that end. Rotatably journaled in the free ends of arms 15, by means of respective trunnions 25, is another bar 6 of rectangular profile, parallel to and somewhat wider than bars 2 and 8, which carries an abutment blade 9 and two brushes facing in opposite directions, i.e. a lower set of bristles 10 and an upper set of bristles 11. Bristles 10 are partly foreshortened at the ends of the lower brush, as seen in FIG. 4, to give clearance to a pair of spacing strips 18 whose height determines the thickness of the board 12. Arms 15 carry shoes 24 which straddle a pair of rails 14 supported on shelves 23.

Bar 6 has internal channels 26, 27 aligned with the brushes 26 and 27, respectively, and communicating with ports 28, 29 (FIG. 2) which open onto the upper and lower surfaces of the bars in the region of brushes 11 and 10, respectively, to exhaust chips and of the pieces scraped off the platen surfaces by their bristles. These channels extend into the trunnions 25 and, in the operative position of bar 6 shown in the drawing, communicate through them with conduits 29 in arms 15 terminating in flexible tubes 30 which lead to a nonillustrated suction pump or pair of such pumps.

As indicated by an arrow 31 in FIG. 1, bar 6 can be rotated from its illustrated operating position in a counterclockwise sense (as viewed in that Figure) about an axis O to withdraw the blade 9 above the level of board 12 and to disengage the brushes 10, 11 from platens 16 and 17. Upon rotation into this ineffectual position, the exhaust lines 26 — 30 are interrupted so that no suction is exerted in the region of the brushes. Bar 6 is in this alternate position (pointing to the right in FIG. 1) during the insertion of the extractor 5 into the space between the platens immediately after the forming of a board 12; when the frame 2 has arrived in its illustrated position, with the blade 9 clearing the board, bar 6 is swung clockwise into its operating position (arrow 32) in which it is retained by means shown in FIG. 4 as a transverse pin 33 on trunnion 25 and an axially extending pin 34 on shoe 24. Blade 9 now drops behind the left-hand edge of board 2 (as viewed in FIGS. 1 and 3) so that the board is removed from the press upon the subsequent rightward stroke of piston 3. A conveyor 35, e.g. a set of endless belts as schematically indicated in FIG. 3, thereupon removes this board from the vicinity of the press even as a new pile is introduced from the left into the press space.

As shown in FIG. 2, blade 9 is provided with a pair of retractable pins 36, which, when projecting endwise from that blade, register with the ends of spacing strips 18 to entrain them together with board 12 into respective magazines, not shown, alongside conveyor 35. In an analogous manner, the same strips 18 or similar strips of different height may be inserted into the press with the aid of the assembly 5, as by means of depending lugs (not shown) on the proximal frame member 7.

At the end of the extraction stroke, the bar 6 may be turned manually or automatically e.g. by a cam on a trunnion 25 riding up a ramp on shelf 23) into its alternate position in which it could then be retained by a suitable latch, such as a retractable pin coacting with pin 34 in the manner of pin 33; this retractable pin may be drawn inwardly in response to the application of suction to the corresponding conduit 29, for example. When this occurs, after the frame 2 has been fully inserted, bar 6 may swing into its operative position under the force of gravity, i.e. through the weight of blade 9; it will be noted that the brushes 10 and 11 are symmetrically positioned with reference to swing axis O so as to substantially balance each other. Similar suction, applied through the other conduit 29, could be used to control the extension and retraction of pins 36. Naturally, different control means (e.g. solenoids) may also be used for rotating the bar 6 and/or moving the pins 36.

The unit 5 may be duplicated for use with multilevel presses, an individual frame 2 being then insertable between any two co-operating press plates.

We claim:

1. In a plant for the production of pressed boards, including a lower plate and an upper plate movable toward and away from each other for the compaction of a pile of particulate material therebetween, the combination therewith of guide means alongside said plates, reciprocable extraction means movable on said guide means from one side into the space between said plates upon separation thereof, and abutment means on said extraction means positionable beyond a remote edge of a freshly pressed board for entraining same out of said space upon withdrawal of said extraction means to said one side, said extraction means comprising a pair of parallel arms and a swivel member supported on said arms for rotation about an axis paralleling said remote edge, said abutment means being mounted on said member, said member having a length at least equal to the dimension of the board parallel to said axis, said abutment means comprising a blade extending over substantially the full length of said member.

2. The combination defined in claim 1 wherein said lower plate is adapted to carry a pair of spacing strips transverse to said axis for limiting the relative approach of said plates, said blade being provided with retractable end extensions engageable with said spacing strips for withdrawing same concurrently with a board.

3. The combination defined in claim 1, further comprising conveyor means at said one side for removing a board entrained by said abutment means.

4. The combination defined in claim 1 wherein said member is provided with brush means effective during said withdrawal to sweep at least one of said plates.

5. The combination defined in claim 4 wherein said brush means comprises a first set of bristles positioned to contact the lower surface of said upper plate and a second set of bristles positioned to contact the upper surface of said lower plate.

6. The combination defined in claim 5 wherein said sets of bristles are relatively staggered in the direction of reciprocation, said first set of bristles trailing said second set of bristles during said withdrawal.

7. The combination defined in claim 4 wherein said member is provided with suction means for exhausting fragments swept up by said brush means.

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8. In a plant for the production of pressed boards, including a lower plate and an upper plate movable toward and away from each other for the compaction of a pile of particulate material therebetween, the combination therewith of guide means alongside said plates, reciprocable extraction means movable on said guide means from one side into the space between said plates upon separation thereof, and abutment means on said extraction means positionable beyond a remote edge of a freshly pressed board for entraining same out of said space upon withdrawal of said extraction means to said one side, said extraction means comprising a pair of parallel arms and a swivel member supported on said arms for rotation about an axis paralleling said remote edge, said abutment means being mounted on said member, said member having a length at least equal to the dimension of the board parallel to said axis, said member being provided with brush means effective during said withdrawal to sweep at least one of said plates, said member being provided with suction means for exhausting fragments swept up by said brush means.

9. The combination defined in claim 8 wherein said

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brush means comprises a first set of bristles positioned to contact the lower surface of said upper plate and a second set of bristles positioned to contact the upper surface of said lower plate.

10. The combination defined in claim 9 wherein said sets of bristles are relatively staggered in the direction of reciprocation, said first set of bristles trailing said second set of bristles during said withdrawal.

11. The combination defined in claim 8 wherein said abutment means comprises a blade extending over substantially the full length of said member.

12. The combination defined in claim 11 wherein said lower plate is adapted to carry a pair of spacing strips transverse to said axis for limiting the relative approach of said plates, said blade being provided with retractable end extensions engageable with said spacing strips for withdrawing same concurrently with a board.

13. The combination defined in claim 8, further comprising conveyor means at said one side for removing a board entrained by said abutment means.

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