ABSTRACT OF THE DISCLOSURE

The invention is directed to a system that feeds, presses and delivers large sheet material which for language purposes is referred to as boards, and includes in association with a multi-plate hot press, a loader means on one side of the press which incorporates a vertically reciprocable multiple rack means or elevator that is movable between a lower position where boards are placed on the racks thereof and an upper position where the racks are horizontally aligned with the platens of the press, a pushing means operable to move the boards from the racks onto the platens of the press. In addition, there is an unloader means on the side of the press opposite the loader means which includes a similar multiple rack type elevator. There is also provided a pulling means for pulling pressed boards out of the press and placing the same on the racks of the second-mentioned multiple rack means. In addition to the above, the system includes a feed means for feeding the boards laterally onto the loader means, a conveyor means on which boards are discharged laterally from the unloader, a delivery means for delivering the boards from the unloader to the conveyor, and an arrangement of an additional pushing mechanism which comprises spaced vertically arranged driving and driven shafts and pushing devices for cooperation with each platen of the press which includes a link lever, a link fixed at one end to the shafts and pivoted at its other end to an intermediate portion of the link lever, another lever fixed at one end to the other shaft and pivoted at its other end to one end of the link lever, the other end portion of the link lever being operable to push against the rear edge of a board and means are provided to oscillate the shafts so that upon movement in one direction the link lever is retracted to a position outside the path that the boards move from the loader to the platens and in moving in the other direction the link lever turns to abut against and push against the rear edge of a board on a press platen to push such board a short distance from the platen so that it can be gripped by the pulling means of the unloader.

This invention relates to a combination of a multiplate hot press, a loader and unloader, and more particularly to a system therefor wherein large sheet material or board to be subjected to a pressing action are introduced into the loader to be fed therefrom into the hot press for the pressing operation, and wherein the sheet or board material which have been pressed by the hot press are conveyed therefrom into the unloader to be delivered out of the latter.

In multiplate hot presses for pressing large sheet or board material such as plywood, fiber boards, laminated planks or the like (hereinafter referred to as "board"), there has recently been a sudden trend toward ultra-high speed of the pressing operation. However, this has been considerably difficult to obtain loaders and unloaders for feeding and drawing the boards into and out of the hot press which can follow a pressing cycle of such increased speed.

In conventional systems of this type, the loader and unloader are disposed before and after on both sides of the press in the longitudinal direction thereof, and the boards are longitudinally fed into the loader to be longitudinally fed therefrom into the press, and after the pressing operation the boards are longitudinally drawn out of the press into the unloader to be longitudinally delivered out of the latter. However, such conventional systems are incapable of following a pressing cycle of increased speed. Moreover, the conventional systems require considerable space for the installation thereof, because additional spaces are needed for the longitudinal feed and delivery of the boards into the loader and out of the unloader, thus making the longitudinal length of the pressing system considerably long. This considerably long length of the system gives rise to inconvenience in operating and controlling the system.

A main object of the present invention is to eliminate the above-mentioned disadvantages of the conventional pressing systems of the above type.

Another object of this invention is to provide a system for feeding and drawing the boards into and out of a press, which can follow a pressing cycle of increased speed.

A further object of this invention is to provide a system for feeding and drawing the boards into and out of a press, wherein the boards to be pressed are fed into the loader laterally thereof at a high speed and wherein the boards which have been pressed are drawn out of the unloader laterally thereof at a high speed.

Still another object of this invention is to provide a pressing system which requires less longitudinal length and affords a compact arrangement for easy and reliable operation and control thereof.

A still further object of this invention is to provide a loader for feeding boards into a press, wherein the boards laterally fed into the loader are caused to take proper positions for the subsequent feed into the press by a stop plate.

The above and other objects of this invention will become apparent as the description proceeds in connection with the accompanying drawings, in which like parts are designated by like reference characters, and in which:

FIG. 1 is a front elevation of a hot press, a loader and an unloader according to this invention, showing the press in open state and board carriers of the loader and unloader in the uppermost positions;

FIG. 2(A) is a plan view of the apparatus shown in FIG. 1;

FIG. 2(B) is an enlarged fragmentary plan view of the pushing mechanism of the apparatus shown in FIG. 1;

FIG. 3 is a side view, partly broken away, of the arrangement of FIG. 1, as seen from the right hand side thereof; and

FIG. 4 is a side view, partly broken away, of the arrangement of FIG. 1, as seen from the left hand side thereof.

Referring now to the drawings, especially to FIGS. 1 and 2, the apparatus according to this invention generally consists of a conventional multiplate hot press I, a loader II for feeding boards to be pressed into the hot press, and an unloader III for drawing out of the press the boards which have been pressed.

The hot press I is of the conventional construction and comprises four upright columns 1 rigidly secured to a base B. The four upright columns 1 support a stationary head crosshead 3 which in operation undergoes vertical reciprocating
movement toward and away from the stationary head due to the driving action of a ram 4 which is slidably supported in a hydraulic cylinder 5. Between the stationary and movable heads 2 and 3, there are arranged a series of hot plates or platens 6 disposed one over another, the uppermost and lowermost platens being secured to the stationary and movable heads 2 and 3, respectively. These hot platens 6 are capable of vertically relative motion and adapted to carry thereon the boards A disposed by the reference letter A.

When a hydraulic medium is introduced into the cylinder 5 from a hydraulic compressor not shown, the ram 4 drives the movable head 3 upwardly, which in turn causes relative upward movement of the hot platens 6 except the uppermost and lowermost platens 6 are reduced, and the boards A disposed therebetweeen are subjected to a pressing action. After the pressing action, the hydraulic medium within the cylinder 5 is drawn therefrom and the press is opened into the state as shown in FIG. 1 for the delivery of the pressed board sheets.

The loader II includes a frame 7 having therein a multiple-shelf board carrier 8. The frame 7 is installed in a pit 14 in the embodiment shown. The multiple-shelf board carrier 8 consists of a series of racks 9 disposed one over another, each laterally spaced to form therebetween a longitudinal space or path as clearly shown in FIGS. 2 and 3. The longitudinal spaces or paths in the racks 9 are in vertical alignment so that a vertically extending space S is formed through the board carrier 8.

The board carrier 8 as described above is capable of vertical reciprocating movement along the frame 7, the movement being effected by a suitable means such as for example a mechanism comprising a reversible motor, a driving chain wheel driven by said motor, another chain wheel, and a chain hung over said wheels, said chain being at its one end connected with the carrier 8 and at another end connected with the driving chain wheel so as to be wound and unwound along said chain wheel, whereby the carrier 8 is reciprocated up and down. For example, the other member as far as said reciprocating movement of the carrier 8 is carried out. In the uppermost position of the board carrier 8, it is in the state, as shown in FIG. 1, in which each rack 9 thereof is flush or level with each adjacent or corresponding hot platen of the press 1 in the open state, and in the lowermost position of said carrier 8 it is situated in the pit 14.

On one side of the frame 7 remote from the press 1, there is provided a board pusher 10 movable into and out of the longitudinal vertical space S through the crossed head 2. The board pusher 10 has a vertically extending body which is slidably supported by a longitudinal guide member 11 so as to be slid along said member. This guide member extends from the crosshead 2 and is rigidly secured to the uppermost portion of the frame 7.

The driving mechanism of the pusher 10 comprises a driving motor 35 mounted on the stationary head 2, a driving wheel 39 supported on said head and driven by said motor through a chain belt 42, a wheel 40 supported on the guide member 11 and driven by said wheel 39 through a chain belt 43, a wheel 41 supported on said guide member 11 and driven by said wheel 40 through a chain belt 44 trained over said wheels 40 and 41, rollers 46 and 50, the shafts of which are supported in bearings supported by the upper portion of the pusher 10, said rollers being engaged in the guide member 11 so as to roll along said guide member 11.

The driving mechanism also includes an arm means connecting the chain with the pusher which includes a lever 47 pivoted at one end onto the shaft of the roller 50 and pivoted at its other end to the side surface of the chain belt 44, and a pin 49 projecting from an intermediate portion of said lever 45 and engaged in the slot 48. The above-mentioned driving mechanism for the pusher 10 may be provided on any one side of the pusher. In this case, driving mechanisms of a pair are adapted to reciprocate the pusher 10. An actual construction of said driving mechanism of a pair is described and shown in another application of mine entitled "Board Material Shifting Mechanism in Board Material Insertion and Ejection Apparatus of Multiplaten Hot Press," Ser. No. 408,942, filed Nov. 4, 1964. According to the driving mechanism of the pusher 10 as described above, when the motor 38 is driven in a direction, the lever 45 carries out a reciprocating motion in the longitudinal direction of the guide member 11, because both end portions of said lever 45 are guided respectively by the chain belt 44 and guide member 11, whereby the board pusher 10 is driven for reciprocating movement along the guide member 11 into and out of the space S. This reciprocating movement is achieved in a manner similar to the movement of the arm 8, as will hereinafter be described. The pusher 10 carries on one side thereof facing the press a series of board grippers 12 positioned respectively so as to grip the edges of the boards A carried on the racks 9 of the board carrier 8 which is at the uppermost position.

The frame 7 supports on one longitudinal side thereof a pair of pinch rolls 13 and 13', which are adapted to be rotated at a high speed and in opposite directions by a motor 15 through suitable transmission means as shown at 16, so as to laterally feed thereby the boards A onto the racks 9 of the board carrier 8.

A support roll 19 is longitudinally mounted within the frame 7 and is driven from the motor 15 through suitable transmission means comprising pulleys 17, 18 and a belt trained over said pulleys, in the direction to laterally feed thereon the boards which have passed through the pinch rolls 13 and 13'. The support roll 19 is positioned at the central portion of the frame 7 so as to prevent the downward movement of the board carrier 8 and is adapted to be received in the longitudinal vertical space S of the carrier 8 when the latter moves downward, as shown in FIG. 14.

The lower pinch roll 13, and support roll 19 are positioned at the same level. This level is such that when the board carrier 8 is lowered to the lowest position, the upper surface of the uppermost rack 9 thereof will be at substantially the same level as the uppermost peripheries of the rolls 13 and 19.

The frame 7 rigidly supports on another longitudinal side thereof a stop plate 20 for stopping the boards A which have been laterally conveyed into the frame 7 by means of the pinch rolls 13, 13', and support roll 13.

Beside the pit 14, there is formed a step 21 as shown in FIG. 3, on which is placed a suitable table 22 of adjustable height. The table 22 is adapted to carry thereon the boards A to be fed into the loader II.

The unloader III is positioned laterally opposite to the loader II with respect to the press 1 and has similar construction and arrangement as those of the loader II.

This unloader III also includes a frame 23 having therein a multiple-shelf board carrier 24 mounted for vertical reciprocating movement along the frame 23. This frame 23 is installed in a pit 25 and extends below the lowermost position of the movable head 3 of the press 1. The multiple-shelf board carrier 24 of the same construction as the board carrier 8 of the loader II and consists of a series of racks 26 disposed one over another, each being laterally separated into two rack
portions 26, and 26, to form therebetween a longitudinal space or path as clearly shown in FIGS. 2(A) and 4. The longitudinal spaces or paths in the racks 26 are also in vertical alignment so that a vertically extending space 35 is formed through the board carrier 24.

The vertical length of the board carrier 24 is substantially the same as that of the board carrier 8 of the loader II, and the distance between any adjacent racks 26 is equal to that between any adjacent racks 9 of the loader II.

The vertical reciprocating movement of the board carrier 24 is effected by a mechanism such as described in connection with the mechanism for operating the carrier 8. In the uppermost position, the board carrier 24 is in the state, as shown in FIG. 1, in which each rack 26 thereof is flush with the adjacent or corresponding hot platen 6 of the press I in the open state, and in the lowermost position of said carrier 24 it is situated in the pit 25.

On one side of the frame 23 remote from the press I there is provided a board puller 27 movable into and out of the longitudinal vertical space 35 through the board carrier 24.

The driving mechanism of the puller 27 comprises the same members 38 to 59, corresponding respectively to the members 38 to 59 of the driving mechanism of the puller 10, whereby the puller 27 is longitudinally driven for reciprocating movement along the guide members 28 into and out of the space 35. This reciprocating movement is achieved in a timed relation to the vertical reciprocating movement of the board carrier 24, as will hereinafter be described. The puller 27 carries on one side thereof facing the press I a series of board grippers 29 positioned so as to grip the leading edges of the boards A which are carried on the hot platens 6 of the press I.

The frame 23 supports on one longitudinal side thereof a pair of pinch rolls 30 and 30, which are similar to the pair of the rolls 13 and 13, and adapted to be rotated at a high speed but in opposite directions to each other by a motor 31 through a suitable transmission means as shown at 32 so as to convey thereby the boards A on the racks 26 toward lateral outside. The pinch rolls 30 and 30, are mounted on the opposite side of the line of feed 10 than are rolls 13, 13,.

A support roll 33 is longitudinally mounted within the frame 23 and is driven by the motor 31 through a suitable transmission means comprising pulleys 34 and 35 and a belt trained over said pulleys (FIG. 2(A)); in the drive the pinch rolls 30 and 30, the boards which have been placed on the racks 26 after the completion of the pressing operation. The support roll 33 is located at the central portion of the frame 23 so as not to prevent the downward movement of the board carrier 24 and is adapted to be received in the longitudinal vertical space 35 of the carrier 24 when the latter moves down into the pit 25.

The lower pinch roll 30, and support roll 33 are positioned at the same level, the arrangement of said members being such that when the board carrier 24 is lowered to the lowermost position, the upper surface of the uppermost rack 26 thereof will be at substantially the same level as the uppermost peripheries of the rolls 30 and 33.

As shown in FIG. 4, on one side of the unloader III there is provided a belt conveyor 36 disposed near the pinch rolls 30 and 30, for conveying the boards coming from said rolls as shown by the arrow e of FIG. 4.

In order to push toward the unloader III the boards which have been pressed and are lying on the hot platens 6 of the press I, there are provided pushing mechanisms 37 and 37, above the press I and under said pushing mechanisms being adapted to be driven longitudinally toward the unloader III by a small distance to cause the leading edges of the boards on the hot platens 6 to project a small distance beyond the edges of the press I. This facilitates the gripping operation of the board grippers 26 of the board puller 27. Each of the pushing mechanisms 37 and 37, comprises a common vertical driving shaft 52 driven by a suitable driving mechanism described heretofore, a common vertical driven shaft 51, and pushing devices each of which is provided at each hot platen 6 of the press I and comprises a link device consisting of a link lever 55, a link 54 fixed at one end onto said shaft 52, and pivoted at its other end to an intermediate portion of said link lever 55, and another link 53 fixed at one end onto said shaft 51 and pivoted at its other end to said link lever 55. The other end of said link lever 55 is provided with a push pad 56 adapted to engage and push against a rear edge of the board on the hot platen 6 out of the press I. The shafts 51 and 51 are driven so as to carry out oscillating movement within a predetermined angle range so that, as shown in FIG. 2(B), at a limiting movement in one direction said link lever 55 is retracted to the position such as shown by chain dotted line and in movement in the opposite direction said link lever is turned through a position abutting against and pushing against the rear edge of the board A on a hot platen 6 of the press I to move the front edge of such board a short distance of the platen toward the the pusher. The shaft 52 can be driven by a driving mechanism, for example, a mechanism comprising a pair of wheels M one of which is fixed to said shaft 52, the other wheel being not shown, a chain or belt M, driven over said wheels, and a reciprocating piston adapted to be reciprocated in a cylinder casing 57 which is supplied with fluid alternately at two portions thereof so as to reciprocate said piston, both ends of said piston being connected in series to said chain or belt so as to rotate said shaft 52 within a range, whereby the link lever 55 is retracted or forced between said positions.

In the apparatus as described above, the opening and closing of the hot press I, the vertical reciprocating movement of the board carriers 8 and 24, the longitudinal reciprocating movements of the board pusher 10 and puller 27, and the longitudinal pushing movements of the pushing mechanisms 37 and 37, are performed with a suitable timed relation as hereinafter described.

Prior to the operation, the board carrier 8 of the loader II is in the state lowered to the lowest position in which the upper surface of the uppermost rack 9 thereof is at the same level as that of the uppermost peripheral faces of both lower pinch roll 13, and support roll 19, and the boards A to be treated are suitably stacked on the table 22 the height of which is adjusted for the feed of boards into the nip between the pinch rolls 13 and 13.

In operation, the boards A on the table 22 are laterally inserted one by one into the nip between the pinch rolls 13 and 13, and the board carrier 8 of the loader II begins its reciprocating movement from the lowest position toward the uppermost position. Since the upper surface of the uppermost rack 9 is flush with the uppermost peripheral faces of both rolls 13, and 19 in the beginning of the operation, a first board inserted between the pinch rolls 13 and 13, after being passed between the rolls 13, and 13, by the feeding action thereof, is passed over the uppermost rack portion 9, and then over the support roll 19 rotating for the lateral feed, and then passed over the uppermost rack portion 9, by the feeding action of the roll 19 until it is stopped by the stop plate 20. In this case, since the pinch rolls 13 and 13, and support roll 19 are rotating at a high feeding speed, the first fed board can reach the stop plate 20 as soon as the board carrier 8 begins its upward movement. The first fed board thus placed on the uppermost rack 9 can then take the proper lateral position for the subsequent longitudinal feed into the hot press due to the pressure of stop plate 20, and is then carried upwardly by the upward movement of the board carrier 8, leaving the support roll 19.

A second board is inserted between the pinch rolls 13 and 13, before the second rack from the top reaches the level of the support roll 19 and is laterally fed onto the
second rack to be carried upwardly in the same manner as mentioned above in relation to the first board. The manner of lateral feed and upward carrying of the following boards will be apparent, and it is to be understood that the lateral feed of the boards must be in a suitable timed relation to the upward movement of the board carrier 8.

When the board carrier 8 has reached its uppermost position, the boards to be pressed are carried on all the racks 9 of the carrier 8 and held in position for the subsequent longitudinal feed by the pusher 10.

With the board carrier 8 in the uppermost position, the board pusher 10 is brought into operation and moves into the frame 7 toward the press I with the board gripper 11 thereon holding the edges of the boards on the racks. Since the corresponding or adjacent racks 9 and hot platens 6 of the open press I are flush or level with one another, the pushing operation of the board pusher 10 is performed conveniently so that the boards on the racks 9 may smoothly pass from the racks 9 onto the hot platens 6. The pusher 10, after complete pushing of the boards into the open hot press I, returns to its original position into the frame 7 after a suitable time interval.

The hot press I, after receiving the boards between the hot platens 6 thereof, is put in operation to press the boards in the well known manner in which the movable head 3 is moved upwardly by the ram 4 of the cylinder 5.

When the hot press I has opened with the movable head 3 thereof in the lowermost position as shown in FIG. 1 and with the pressed boards carried on the hot platens thereof, the board pushing mechanisms 37 and 37A are operated to slightly push the boards beyond the edges of the hot platens 6 toward the unloader III. At this time, the board puller 27 is in an advanced position in which it is situated close to the press I so that the board grippers 29 thereof grip the leading edges of the boards which have been pushed beyond the edges of the hot platens 6. The board puller 27 is then retracted away from the press I through the vertical longitudinal space S, and reaches the position shown in FIGS. 1 and 2(A). The board carrier 24 of the unloader III, of course, is in the uppermost position, shown in FIG. 1, in which each rack 26 thereof and each hot platen 6 are flush with each other, when such retracting motion of the puller is performed.

When the board puller 27 has arrived at its completely retracted position, the boards are in place for the lateral delivery thereof and the grippers 29 are released to make the boards free. The pushing mechanisms 37 and 37A, after the completion of their function, return to their original positions shown in FIGS. 1 and 2(A) after a suitable time interval.

After the pressed boards have been placed in position on the racks 26 of the board carrier 24, this carrier 24 begins its downward movement along the frame 23. When the lowermost rack 26 of the carrier 24 reaches a position which is at the same level as that of the support roll 33, the board carried by the lowest rack 26 contacts the roll 33 and is then conveyed into the nip between the pinch rolls 30 and 30A, to be fed thereby at a high speed out of the frame 23 as shown by the arrow e of FIGS. 2(A) and 4, and then ejected onto the conveyor 36 to be conveyed away from the unloader III.

When the second rack 26 reaches the level of the support roll 33, the board carried by the second rack 26 from below is also conveyed out of the frame 23 in the same manner as described above in connection with the lowermost board. It will be understood that the delivery of the following boards is the same as that described above, and all of the boards carried on the racks 26 are conveyed out of the frame 23 when the board carrier 24 reaches the lowest position thereof. After the unloader III has delivered all boards therein, the board carrier 24 returns to its uppermost position ready for the subsequent operation.

Generally, the shape of the boards is rectangular and the length of lateral sides thereof is about one half of the length of the longitudinal sides thereof. Accordingly, the lateral feed and delivery of the boards enable a reduction by one half of the time required for the feed of the boards into the loader II and the delivery of the boards out of the unloader III, as compared with the conventional longitudinal feed and delivery of the boards. This reduction in time required for the feed and delivery of the boards becomes more advantageous as the number of hot platens and, accordingly, the number of boards to be treated at a time are increased.

With the increase of the feeding speed of the boards into the press I or the number of hot platens, the necessity of positioning the boards accurately onto the racks of the carrier becomes greater. According to this invention, the stop plate 20 of the frame 7 of the loader II ensures correct disposition of the boards onto the racks. This is very advantageous for smooth operation of the press I.

From the foregoing, it will be seen that according to the present invention, an improved system capable of feeding and drawing boards into and out of the press with a high speed operation with a compact arrangement is obtained.

While a preferred embodiment of the invention has been shown and described hereinbefore, it is to be understood that all matter herein set forth or shown is to be interpreted as illustrative and not in a limiting sense. What I claim is:

1. A system for feeding, pressing and delivering large size sheet material such as boards, including in combination
   (1) a multi-platen hot press,
   (2) loader means disposed on one side of said hot press and extending longitudinally thereof and comprising
      (2a) a frame,
      (2b) a board-receiving multiple rack means vertically reciprocably movable within said frame between an uppermost position in which the racks are horizontally aligned with the platens of the press and a lowermost board receiving position, and
   (2c) a pushing means operable to push boards received on the racks of said board-receiving multiple rack means onto the platens of said multi-platen hot press,
   (3) unloader means arranged on the side of the multi-platen hot press remote from said loader means, extending longitudinally of said multi-platen hot press and including
      (3a) another board-receiving multiple rack means vertically reciprocably movable between an uppermost position horizontally aligned with the platens of the press and a lowermost position, and
      (3b) pulling means for pulling pressed boards out of said press and placing the same on said second board-receiving multiple rack means,
      (4) feed means for feeding boards to be pressed onto said first-mentioned board-receiving multiple rack means of the loader means,
      (4a) said feed means being disposed longitudinally along one side of said loader means and being operable to feed boards laterally to the loader means,
      (5) a stop member for stopping boards fed onto the multiple rack means of the loader means,
      (5a) said stop member being arranged along the side of said loader means opposite said feed means,
      (6) a conveyor means arranged longitudinally of a lateral side of the unloader means for moving pressed boards laterally from the unloader,
      (7) means for delivering pressed boards received on the multiple rack means of the unloader means onto said conveyor means, and
      (8) at least one pushing mechanism for pushing pressed boards supported on the platens of the multi-platen press toward the pulling means of said unloader means, said pushing mechanism comprising a com-
mon vertically arranged driving shaft, a common vertically arranged driven shaft, and a plurality of pushing devices each for cooperation with each platen of the multi-platen press, each pushing device comprising a link lever, a link fixed at one end to one of said shafts and pivoted at its other end to an intermediate portion of said link lever, another link fixed at one end to the other of said shafts and pivoted at its other end to one end of said link lever, the other end portion of said link lever being operable to push against a rear board edge, and means for oscillating said shafts so as to carry out oscillating movement between a predetermined angular range so that upon moving in one direction said link lever is retracted to a position outside the path of board movement during pushing of said boards from the loader onto the platens of said multi-platen press and upon movement of said shafts in the other direction said link lever is turned to the position abutting and pushing against the rear edge of the board on the platen of the press to push said board a short distance from the associated platen of the press toward the pulling means of the unloader means.

2. A system as claimed in claim 1 and in which said pushing means comprises a driving means, a sprocket wheel driven by said driving means, another sprocket wheel spaced from said first-mentioned sprocket wheel, a sprocket chain trained over said sprocket wheels, a guide means extending longitudinally of the press toward the platens thereof, a pusher structure adapted to slide longitudinally along said guide means, and an arm means connecting said chain with said pusher structure so as to reciprocate said pusher structure to feed boards from the multiple rack means of the loader means onto the platens of the multi-platen press, and said pulling means for pulling pressed boards off the platens onto the board-receiving multiple rack means of the unloader means also comprising a driving means, a sprocket wheel driven by said driving means, another sprocket wheel spaced from said first-mentioned sprocket wheel, a sprocket chain trained over said sprocket wheels so as to be driven thereby, another guide means extending longitudinally of the press, a puller structure adapted to slide along said guide means longitudinally thereof toward said unloader means, and an arm means connecting said chain with said puller structure so as to pull pressed boards out of the press onto the racks of the board-receiving multiple rack means of the unloader means.

References Cited

UNITED STATES PATENTS

1,795,352 3/1934 Sundbom 198—24
2,704,608 3/1955 Graf et al. 187—76
2,718,972 9/1955 Temple 214—16.4
2,726,775 12/1955 Howard 214—16.4
2,907,479 10/1959 Cunningham 214—16.6
3,129,927 4/1964 Hutter 214—16.4

FOREIGN PATENTS
763,375 12/1956 Great Britain.
815,442 6/1959 Great Britain.
858,412 1/1961 Great Britain.

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