May 16, 1933. G. H. ELLIS 1,908,699

MEANS FOR FEEDING ARTICLES TO AND WITHDRAWING THEM FROM A PRESS

Filed Oct. 20, 1930 3 Sheets-Sheet 1

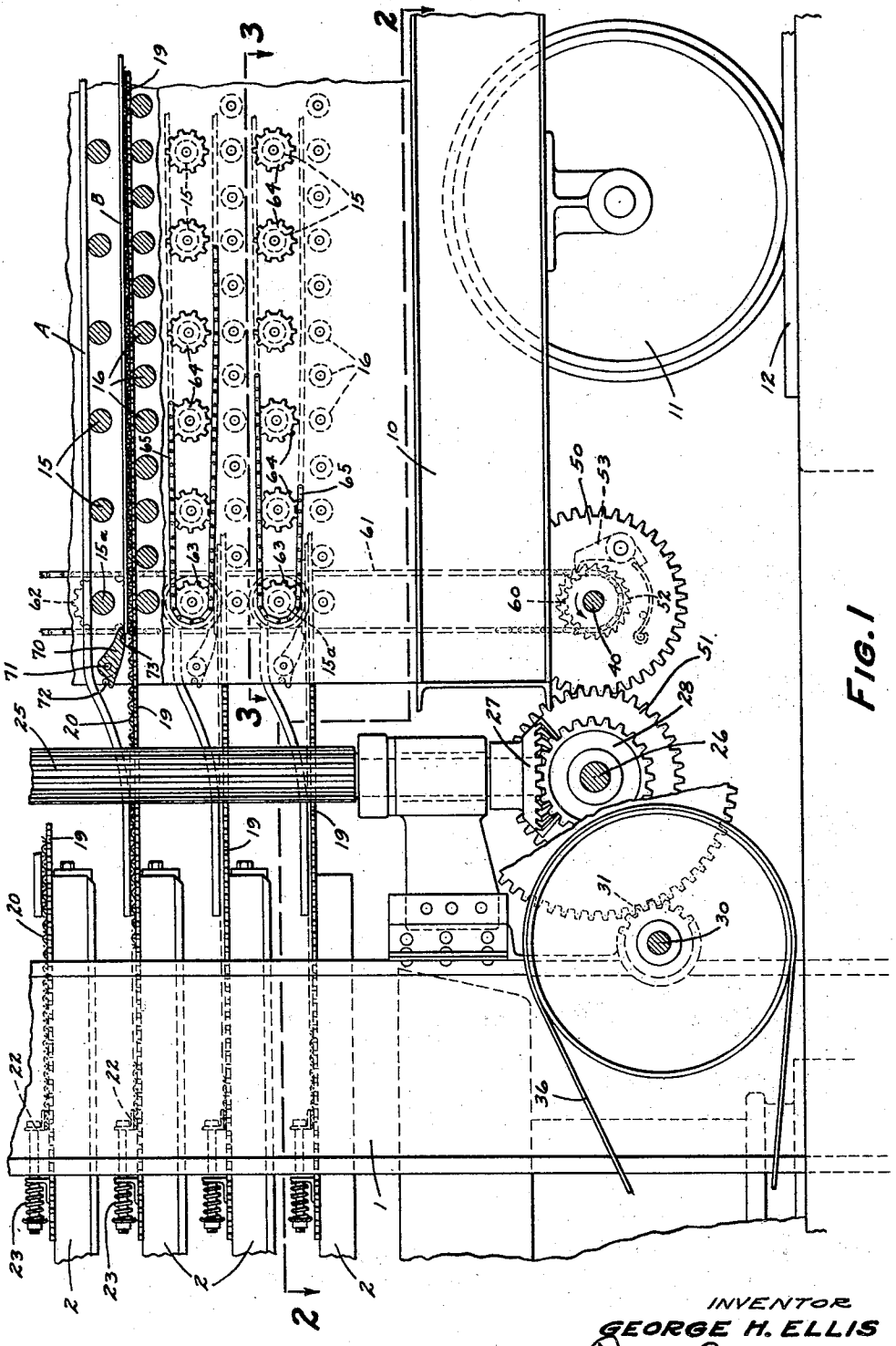

FIG. 1

INVENTOR
GEORGE H. ELLIS
BY Paul, Paul & Moore
ATTORNEYS

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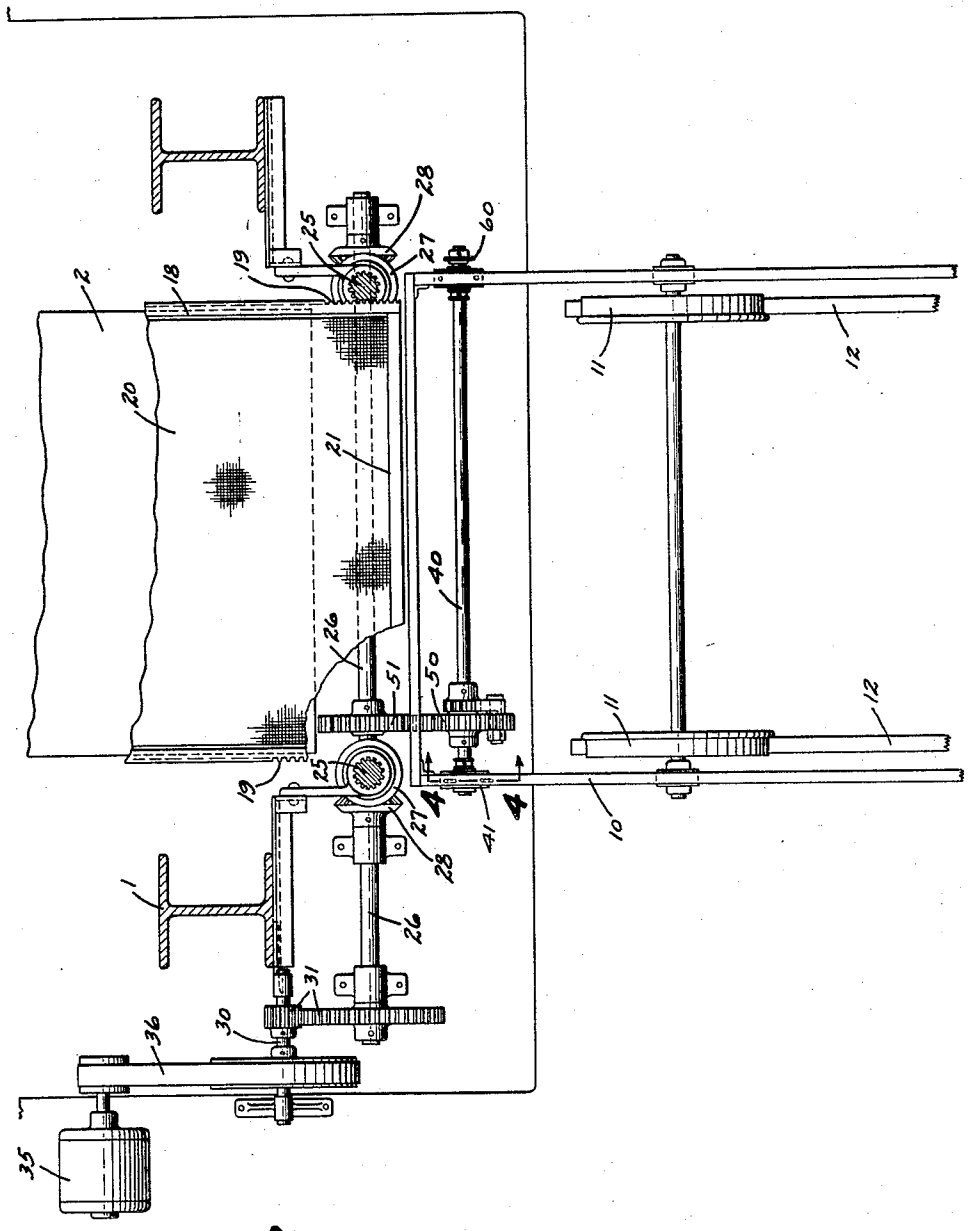

FIG. 2

INVENTOR
GEORGE H. ELLIS
BY Howard, Howard & Moore
ATTORNEYS

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FIG. 3

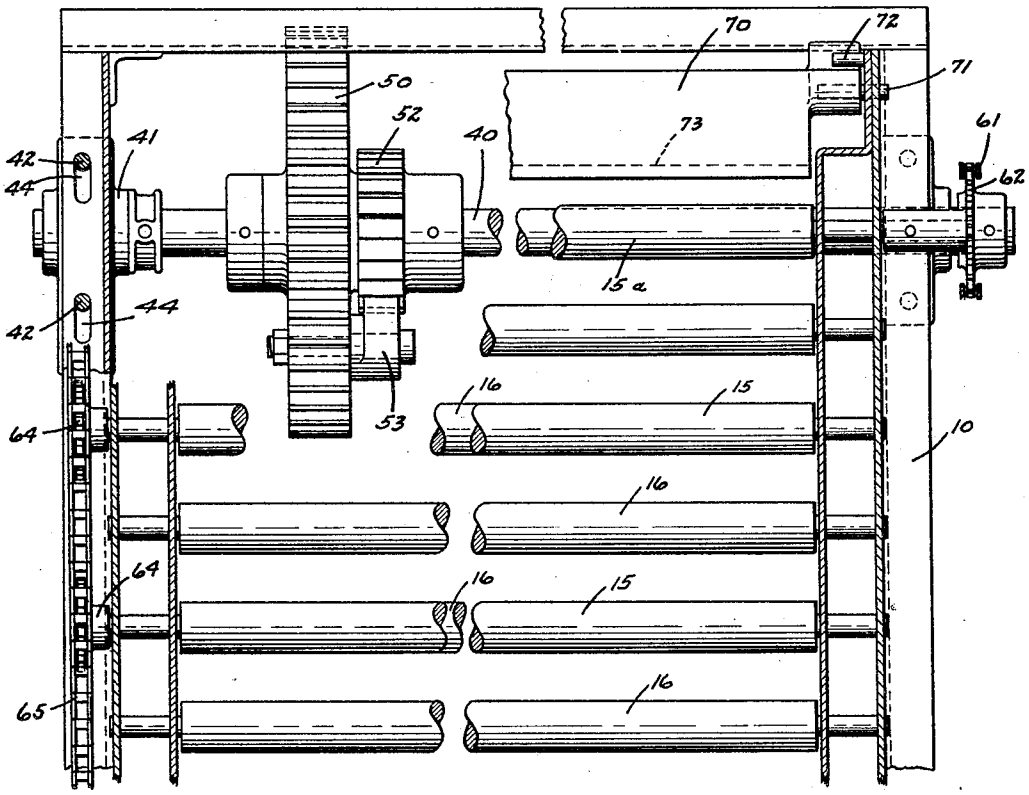
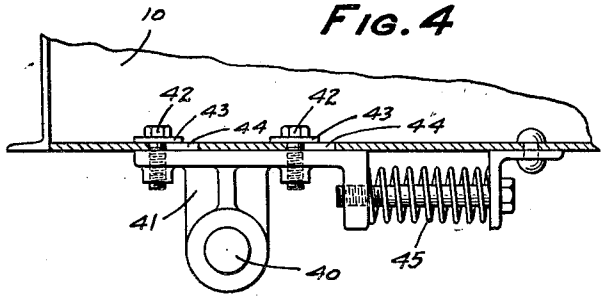


FIG. 4



INVENTOR
GEORGE H. ELLIS
BY Paul, Paul & Woodcock
ATTORNEYS

Patented May 16, 1933 1,908,699

UNITED STATES PATENT OFFICE

GEORGE H. ELLIS, OF ST. PAUL, MINNESOTA, ASSIGNOR TO THE INSULITE COMPANY, OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA

MEANS FOR FEEDING ARTICLES TO AND WITHDRAWING THEM FROM A PRESS

Application filed October 20, 1930. Serial No. 489,986.

This invention relates to a means for automatically feeding to a press, articles to be pressed, and for removing the pressed articles therefrom, and is particularly concerned with provision of means for the above purposes, adapted to handle a plurality of articles to be pressed, and simultaneously move them to and from pressing position.

Among the objects are: to provide in combination with a press having a plurality of pressing elements, means for each pressing element adapted to deliver the product to the press, means for moving the delivery means toward and away from pressing position, means for delivering an unpressed article upon each delivery means as it moves to pressing position, and means for moving a pressed article from each delivery means as said means moves to pressing position.

Features include all the details of construction shown, along with the method and broader ideas of means.

Features, objects, and advantages of the invention will be set forth in the description of the drawings forming a part of this application, and in said drawings

Figure 1 is an elevation partly in section showing a portion of a press, with the invention applied thereto, and with the delivery mechanism positioned as during delivery of unpressed articles to the press, following a withdrawal of pressed articles;

Figure 2 is a plan section taken substantially on line 2—2 of Figure 1, but with the delivery mechanism positioned as during a pressing operation;

Figure 3 is a plan section of the car on movable support, taken substantially on line 3—3 of Figure 1, with the screen frame or article-support removed; and

Figure 4 is a detail vertical section taken substantially on line 4—4 of Figure 2 illustrating the slidable bearing, of that portion of the driving mechanism which is adapted to automatically couple with the other portion of said mechanism, as the car assumes operative relation with the press.

The press, in conjunction with which the present invention is now used, is of the type which has a plurality of superposed horizontally disposed pressing elements, with means (not shown), for causing the elements to assume a spaced relation to receive articles to be pressed, and for bringing them together substantially simultaneously to perform the pressing operation. Some of these presses have as many as twenty pressing elements or plates, and the surface area of each plate is about four and one-half by twelve and one-half feet. When using presses with such a relatively large number of pressing elements, it is of course advantageous to simultaneously feed the unpressed articles to the press, and to simultaneously withdraw such articles after pressing. The number and size of the pressing elements is therefore particularly mentioned because it provides means of comparison to show the decided economic gains arising from the practice of the present invention. The press frame is indicated at 1, and the pressing elements at 2. These pressing elements are generally hollow and suitable means (not shown) is provided for introducing steam for heating them. The invention is not concerned with press structure but with the method and means for loading the press with unpressed articles, and for removing such articles therefrom after pressing.

It has heretofore sometimes been the practice to feed the sheets by hand, but a uniform product has not resulted because if so fed, those sheets which are first introduced between the hot plates become dried before the others can be placed in pressing position, and thus, since the pressing time is fixed for any given product, the sheets (containing different degrees of moisture) are over- or under-heated. This is a serious objection.

It has sometimes been the practice to load the press from opposite sides, but this requires two movable supports from which the unpressed articles are fed to the press and to which the pressed articles are delivered. Among the important objects of the present invention are: to provide loading and unloading means which may be used only at one side of the press so that the press can be placed close to a wall to conserve space; to provide means adapted to simultaneously

deliver a plurality of unpressed articles to their respective pressing elements; to simultaneously withdraw the pressed articles; and to feed the article supports toward the press and while feeding to deposit on each an unpressed article so that at the end of this movement the article is disposed in pressing position. It is obvious that a large amount of time is saved by feeding the article to be pressed upon the support during the travel of the support toward the press.

In the present device, the article supports are moved into pressing position, remain in pressing position during the pressing operation and then move outwardly carrying therewith the pressed article. Then they move forwardly into the press or between the press plates again and during this movement the unpressed article is deposited on the support and at the end of its press-ward movement, the article is disposed at the pressing position. Also during motion toward the press, pressed articles are automatically dragged or removed from the supports, whence they are removed while the pressing operation is performed. Considerable time is thus saved.

Numeral 10 indicates the frame of a car, having flanged wheels indicated at 11, operable on the usual tracks 12, thus providing a support which is movable relative to the press. On this support are arranged superposed spaced horizontally disposed sets of rolls (or other suitable carriers or feeders) two sets for each pressing element, an upper set the members of which are indicated at 15, and a lower set the members of which are indicated at 16. Upon the upper feed rolls 15, the article A to be pressed is deposited. The invention has been applied to handling articles formed of pulped woody material, having a predetermined moisture content, this material having been formed into sheets, by felting.

Mounted to move upon each set of lower rolls 16 is a screen frame, see Figure 2, generally indicated at 18 and having at each of two opposite longitudinal sides a rack 19, also see Figure 1. This frame is of an area greater than that of the press faces, and is covered with screening indicated at 20. The screening is suitably permanently connected at one end 21 of the frame and at the opposite end is connected to a cross bar 22, see Figure 1, which in turn is put under tension to hold the screen in taut condition by any suitable means, generally indicated at 23. The screen supports the article while being pressed. The screen frames are disposed on the rollers 16 at such level that when they are fed (in this instance) in a horizontal direction they are moved onto the top of the corresponding pressing element, that is to pressing position.

The racks of each screen are engaged by vertically arranged shaft-gears 25 and these gears are suitably driven from shaft 26 through pairs of bevel gears 27—28. The shaft 26 is driven from shaft 30 through gears 31, the shaft 30 being driven in this case from a motor 35 through belt and pulley means generally indicated at 36. The driving means for the screen frames is adapted to operate on frames simultaneously and the reversing motions may be obtained by reversing the motor or through suitable clutch means, not shown.

Means is provided for simultaneously operating all upper sets comprising rolls 15, to cause them to feed an unpressed article A upon the corresponding screen as the screen moves towards the press. To this end, a drive shaft 40 is journaled at the bottom of the car upon a bearing 41 which is attached to the car as shown in Figure 4 for movement in a direction perpendicular to the shaft axis. In this instance, the bearing is movably connected by means of screws 42 passing through washers 43 and through slots 44. A spring 45 tends to push the bearing to its forward position, that is toward the shaft 26. Loosely mounted on the shaft 40 is a spur gear 50 which is adapted to mesh with the corresponding spur gear 51 of shaft 26, when the car 10 assumes the position shown in Figure 1. Keyed to the shaft 40 is a ratchet wheel 52 which is operated by spring pressed pawl 53 attached to the gear 50 to feed the shaft in direction of the arrow. At one end of the shaft 40 is a sprocket wheel 60 connected by a sprocket chain 61 with each of a series of sprocket wheels 62, one for each terminal roll 15^a of the rows of rolls 15. The opposite end of each one of these rolls 15^a is provided with a sprocket wheel 63 and each of the rolls 15 is provided with sprocket wheel 64. A chain 65 connects the sprocket 63 with sprocket 64 whereby all rolls 15 can be simultaneously operated to feed the unpressed article forwardly onto the screen, as shown in Figure 1, in which the screen frames and material to be pressed are being fed into the press.

The ratchet mechanism including elements 52 and 53 provides means whereby the feed rolls 15 are rotated to feed the unpressed articles in the same direction as the direction of travel of the screens, or article supports, that is towards the press, and to permit these screens to be moved in the opposite direction, that is away from the press without causing motion of the shaft 40 and therefore of the rolls 15 and 15^a.

Other forms of carriers for supporting the frames, and for moving the material to be pressed may be employed.

Means is also employed on the support, and adapted to engage each pressed article B, after delivery to the support, to hold it against motion toward the press, while the article-ladened screen frame moves toward pressing position, see Figure 1. In this in-

stance, this means comprises a pawl 70 pivoted as at 71 and limited in its downward movement by a suitable pin 72, so that its article-engaging portion will never engage the screen frame or screen. These pawls extend lengthwise entirely across the rolls as shown in Figure 3, and each is terminally provided with a notch or shoulder 73 which engages the edge of the pressed article B, as shown in Figure 1. It will be understood that as the screen travels from the press, the pressed article passes beneath the pawl (raising it) and that edge of the article nearest the press passes beyond the shoulder 73. Thus when the screen motion is reversed as is shown in Figure 1, the pressed element B is held from re-entry into the press while the frame moves from beneath it, and by the time the frame has moved sufficiently to place the unpressed article in pressing position it has been withdrawn from beneath the article B, and B rests upon the roller 16. During the pressing operation, car 10 is moved away from the press, the pressed articles B are removed, and other unpressed articles A are placed on the rolls 15. At the end of the pressing operation, the car is again moved to the position shown in Figure 1, the screens are first withdrawn to move the pressed material to a position over the rolls 16, and then as the screens are again fed forwardly towards the press, the cycle is repeated in the manner before described.

By the use of the method and means above described production is speeded up greatly and, as before stated, only one car is necessary for each press. By simultaneously feeding into pressing position the sheets have substantially the same amount of moisture before pressing and therefore for a given time of pressure, the final products are uniform.

I claim as my invention:

1. A press having a plurality of pressing elements, means adapted for automatically delivering an unpressed article to each of the pressing elements and withdrawing the article therefrom after pressing, means for automatically transferring an unpressed article to each of the aforesaid means, and means for automatically removing a pressed article from each delivering and withdrawing means.

2. A press having a plurality of pressing elements, frames adapted for simultaneously delivering an unpressed article to each of the pressing elements, and for simultaneously withdrawing each article therefrom after pressing, means for simultaneously transferring an unpressed article to each frame during motion of the frame to pressing position, and means for simultaneously removing a pressed article from each frame as it moves to pressing position.

3. A press having a plurality of pressing elements, frames adapted for delivering an unpressed article to each of the pressing elements and withdrawing the article therefrom after pressing, means for transferring an unpressed article to each frame during motion of the frame to pressing position, and means for removing a pressed article from each frame as it moves to pressing position, all frames and means being arranged at one side of the press.

4. A press having a plurality of pressing elements, means for each pressing element adapted to deliver the product to the press, means for moving said delivery means toward and away from pressing position, means for delivering an unpressed article upon each delivery means as it moves to pressing position, and means for removing a pressed article from each delivery means as said means moves to pressing position.

5. A press having a plurality of superposed spaced horizontally disposed pressing elements, a support having correspondingly disposed sets of rolls, two sets for each pressing element, an upper and a lower set, a frame having a screen upon which the article lies while being pressed, one such frame being supported upon each lower set of rolls and being adapted to be moved by the rolls to pressing position, means adapted to feed the frames from the lower sets of rolls to the press plates and vice versa, means adapted to operate the upper sets of rolls to cause them to feed an unpressed article upon the corresponding screen as said frame moves toward the press, and means upon the support adapted to engage each pressed article after delivery to the support, and hold the article against motion while the screen frame moves toward the press.

6. A press having a plurality of pressing elements, a support movable relative to the press and having thereon means by which an unpressed article is delivered to each pressing element and gearing which is adapted to operate said means for advancing the same toward the press and withdrawing the same therefrom, means on said support for transferring an unpressed article to each delivery means during motion thereof to pressing position, means on the support for removing a pressed article from each delivery means as the frame moves to pressing position, gearing on the support for operating the two last mentioned means, said gearing being adapted to be operatively coupled with the first mentioned gearing when the support assumes operative relation with the press.

7. A press having a plurality of pressing elements, a support movable relative to the press and having thereon frames by which an unpressed article is delivered to each pressing element, gearing which is immovable relative to the support and is adapted to operate the frames for advancing them toward the press and withdrawing them therefrom,

means on said support for transferring an unpressed article to each frame during motion of the frame to pressing position, means on the support for removing a pressed article from each frame as the frame moves to pressing position, gearing on the support for operating the two last mentioned means, said gearing being adapted to be operatively coupled with the first mentioned gearing when the support assumes operative relation with the press.

8. A press having a plurality of pressing elements, first and second feed means for each pressing element, a frame for and adapted to be delivered by each first feed means to the corresponding pressing element, each of said second feed means being adapted to deliver an unpressed article to the corresponding frame, means for moving said frames, feed means adapted to cause said frames to move toward and away from pressing position, means synchronized with said frame feed means for operating the second feed means to deliver an unpressed article to the frames as they move toward the press, and means for engaging each pressed article after withdrawal from the press to hold it from reentry thereinto, while the frame moves from beneath it toward the press.

9. A press having a plurality of horizontally disposed spaced pressing elements, a support adapted to move toward and away from one side of the press, and having means thereon for delivering an unpressed article to each of the pressing elements and withdrawing the article therefrom after pressing, means for transferring an unpressed article to each delivering and withdrawing means, and means likewise on said support for removing a pressed article from each delivery and withdrawing means.

10. A press having a plurality of horizontally disposed spaced pressing elements, a support adapted to move toward and away from one side of the press, and having means thereon for delivering an unpressed article to each of the pressing elements and withdrawing the article therefrom after pressing, means for transferring an unpressed article to said delivery means, means for removing a pressed article from said delivery means, and means synchronizing the motions of the delivering, withdrawing and transferring means, for delivering an unpressed article to said delivering means as said delivering means moves toward the press.

11. A press having a plurality of pressing elements, a frame having correspondingly disposed sets of rolls, two sets for each pressing element, first and second, means upon which the article is supported while being pressed, one such means being supported upon one member of each set of rolls and being adapted to be moved by the rolls to pressing position, means adapted to feed the supports from the rolls to the corresponding pressing element and vice versa, means adapted to operate the other sets of rolls to cause each set to feed an unpressed article upon the corresponding support as said support moves toward the press, and means upon the frame adapted to engage each pressed article after withdrawal from the press and hold the article against re-entry while the supports move towards the press.

12. A press, means adapted for automatically delivering an unpressed article to the press and withdrawing the article therefrom after pressing, means for automatically transferring an unpressed article to the aforesaid means, means for automatically removing the pressed article from said means.

13. A press, means adapted for automatically delivering an unpressed article to the press and withdrawing the article therefrom after pressing, means for automatically transferring an unpressed article to the aforesaid means, means for automatically removing the pressed article from said means, said delivery and transfer means being mounted on a support at one side of the press, which support is movable toward and away from the press.

14. A press, a reciprocable element adapted to move toward and away from the press and to remain in the press during the pressing operation, means for transferring an unpressed article to said reciprocable element, and means for synchronizing the motion of said reciprocable element and transfer means to obtain transfer of the unpressed article as said reciprocable element moves toward the press.

15. A press having pressing elements, a frame and means for reciprocating the frame to move it between and withdraw it from the press elements, means for delivering an article upon the frame as it moves toward the press, and means for holding a pressed article to prevent reentry into the press while the frame moves to a position between the pressing elements, and means for synchronizing the actions of the foregoing means.

16. A press, a support movable toward and away from the press, automatically operable means on said support adapted to deliver an unpressed article to and withdraw the pressed article from said press, means for automatically transferring an unpressed article to the delivery and withdrawal means on movement of that means toward the press, and means for automatically removing a pressed article from said delivery and withdrawing means as said means move toward the press.

17. A press, reciprocable means adapted to feed an article to and withdraw the same from the press, means for delivering the article to said reciprocable means as said means moves towards the press, means for syn-

chronizing the motions of the foregoing means, and means adapted to automatically engage the article on said reciprocable means after withdrawal of said means from the press, to prevent re-entry into the press.

18. A press, a support and means for moving it into and out of the press, means for feeding an article to and depositing it upon the support during movement of said support, and means for engaging the article after withdrawal from the press and preventing re-entry there-into.

19. A press, a support and means for moving it into and out of the press, means for depositing an article upon the support during movement of said support and detent means for engaging the article after withdrawal from the press and preventing re-entry there-into.

20. A press, means adapted for delivering an unpressed article to the press by movement in one direction and for withdrawing the same article after pressing by a movement in the opposite direction, means for transferring an unpressed article to the aforesaid means during motion, and means for removing the pressed article from said means during motion.

21. A press, means adapted for delivering an unpressed article to the press by movement in one direction and for withdrawing the same article after pressing by a movement in the opposite direction, means for transferring an unpressed article to the aforesaid means during motion, and means for removing the pressed article from said means during motion, said two last mentioned means acting simultaneously as the first mentioned means moves to deliver another unpressed article to the press.

In witness whereof, I have hereunto set my hand this 17th day of October 1930.

GEORGE H. ELLIS.