

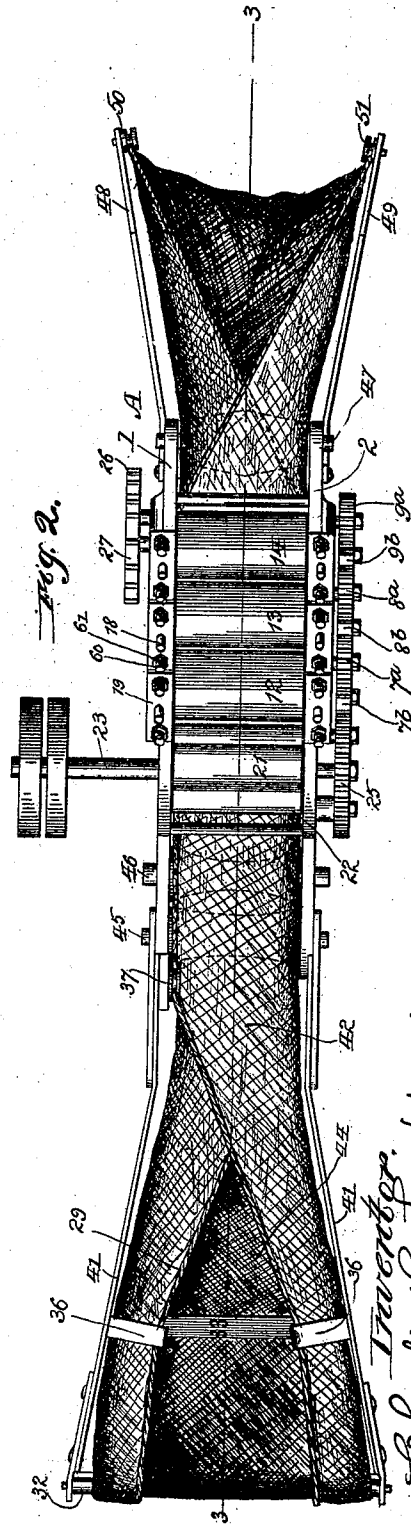
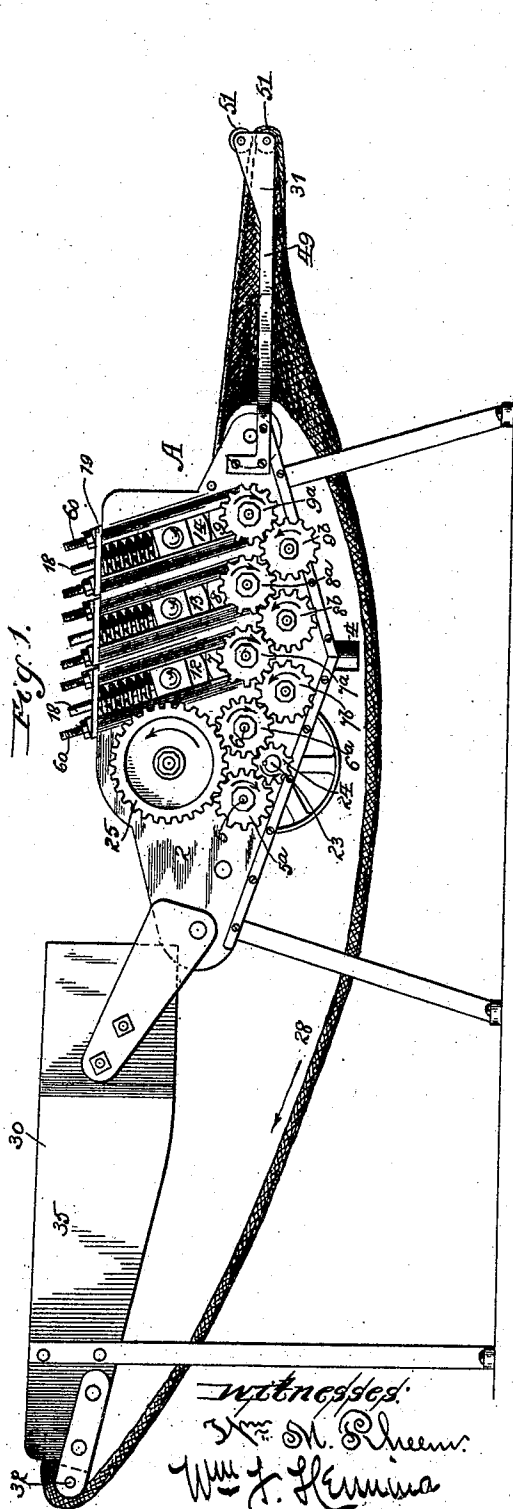
(No Model.)

C. C. LOCKSTAEDT.
PRESS.

2 Sheets—Sheet 1.

No. 502,523.

Patented Aug. 1, 1893.



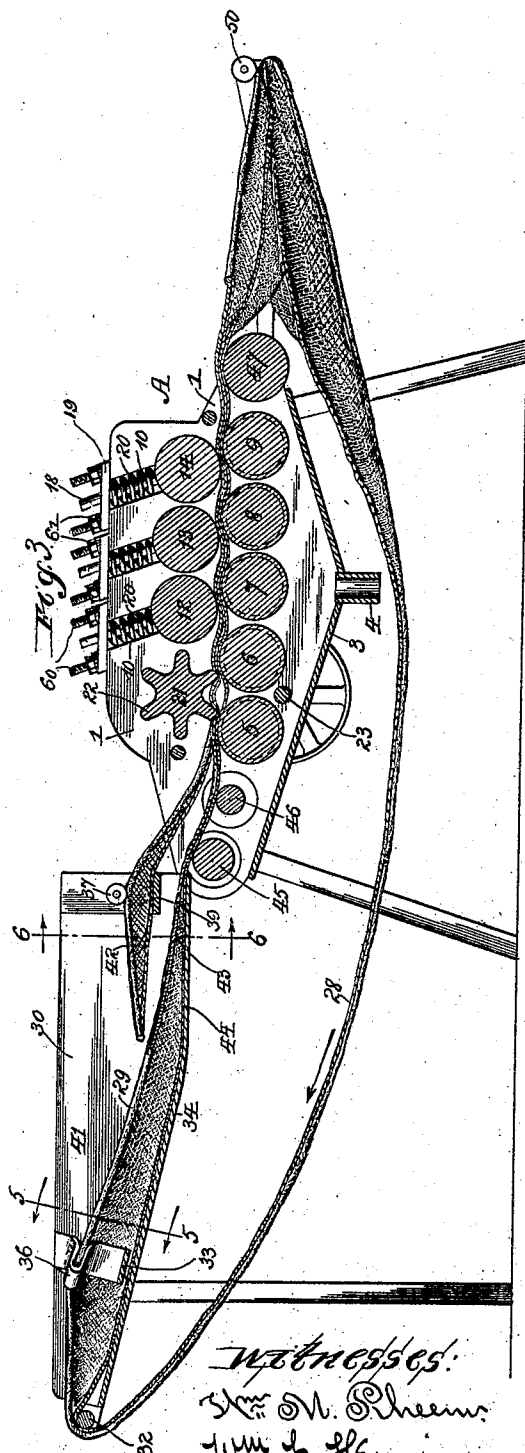
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C. C. LOCKSTAEDT.
PRESS.

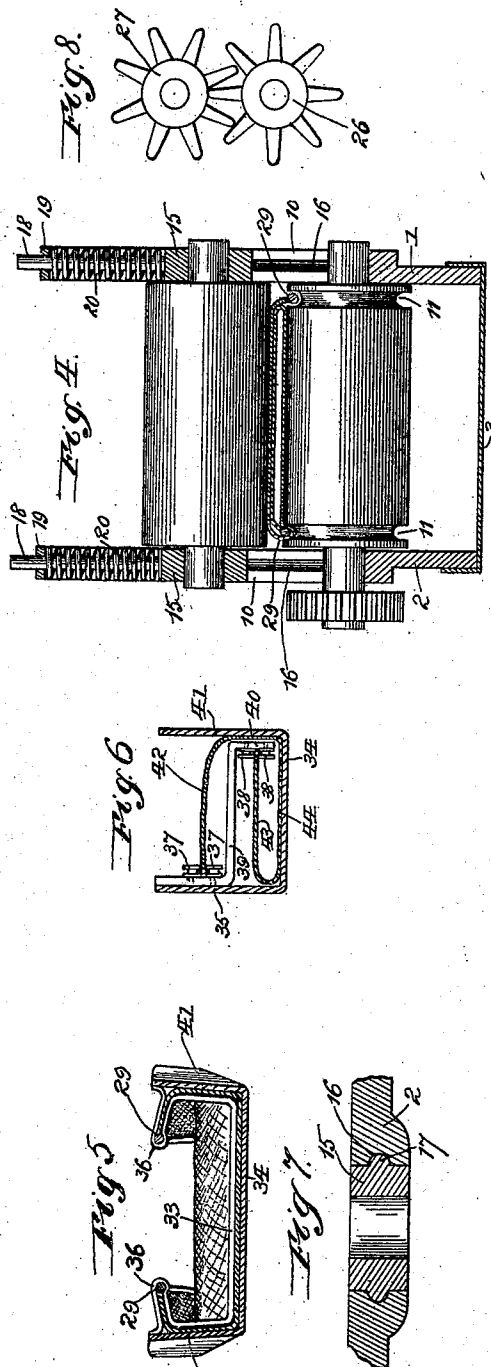
2 Sheets—Sheet 2.

No. 502,523.

Patented Aug. 1, 1893.



Witnesses:
Wm. M. Rheem
Wm. J. Huming



Inventor:
Charles C. Lockstaedt
By *John Kennedy* Atty's.

UNITED STATES PATENT OFFICE.

CHARLES C. LOCKSTAEDT, OF CHICAGO, ILLINOIS.

PRESS.

SPECIFICATION forming part of Letters Patent No. 502,523, dated August 1, 1893.

Application filed April 12, 1892. Serial No. 428,918. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. LOCKSTAEDT, a subject of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in a press designed for compressing or expelling moisture from various substances, the object being to provide a press in which the matter to be compressed can be fed continuously therethrough and at the same time subjected to great pressure; to provide a press in which the matter is inclosed between two or more folds of a fabric or other porous material and to provide for the general efficiency and utility of machines of this description.

The invention consists in the several features of construction and combinations of parts hereinafter fully described and specifically claimed.

In the accompanying drawings illustrating my invention, Figure 1 is a side elevation of a press constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical longitudinal sectional view on the line 3—3 of Fig. 2. Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 1. Fig. 5 is a sectional view on the line 5—5 of Fig. 3. Fig. 6 is a sectional view on the line 6—6 of Fig. 3. Fig. 7 is a fragmentary sectional view illustrating one of the sliding boxes for the upper presser rolls. Fig. 8 is a detailed elevation of the expansion gearing between the last pair of presser rolls.

Referring now to the drawings A indicates the main frame of the machine comprising the side plates 1 and 2 and the bottom 3 thereby forming a trough-like compartment that is open at its ends and top. The bottom 3 of the frame is inclined downwardly from each end and is provided at its lower point with an outlet pipe 4 which can be connected with any suitable pipe or passage for the purpose of carrying off any liquid or fluid matter that may run down the inclined sides of the bottom into said pipe 4. Between the side plates 1 and 2 of said frame the presser rolls are lo-

cated and are journaled in suitable bearings mounted upon said side plates which will now be described. The lower presser rolls indicated by 5, 6, 7, 8 and 9 are provided at their end with gudgeons or journals that are arranged in suitable bearings in said side plates 1 and 2 and in the construction illustrated three of said bearings are formed in the lower ends of slots 10 in said side plates while the bearings for rolls 5 and 6 are formed in said side plates in any convenient manner. The said lower presser rolls are conveniently arranged in a horizontal line and each is provided at its ends with annular grooves 11 (Fig. 4). The three upper presser rolls 12, 13 and 14 are provided also with gudgeons or journals and these are mounted in suitable bearing boxes 15 that are located to slide within the slots 10 in the side plates of the frame. In the walls of said slots 10 are provided the upright longitudinal grooves 16 that receive the ribs 17 on said bearing boxes. In this way it will be seen that the upper presser rolls 12, 13 and 14 are capable of sliding up and down with relation to the lower presser rolls and to the frame of the machine.

To the upper side of each of the bearing boxes 15 is secured a guide pin 18 that passes through a plate 19 adjustably secured to the upper edge of the side plates 1 and 2 by bolts 60 and nuts 61 and closing the upper ends of said slots 10. A spring 20 encircles said guide pin 18 and bears at its opposite ends against the upper side of the boxes 15 and against the plate 19. The said springs 20 exert a pressure upon the upper sides of the boxes and thereby keep the upper presser rolls against the lower presser rolls under tension, although they are at liberty to yield to accommodate the thickness of the substance passing between the presser rolls. In said drawings it will be noted that I have illustrated five lower presser rolls and three upper presser rolls, although it will be understood that the number may be varied as found convenient and that a greater or smaller number of rolls may be employed as found convenient. It is found preferable to arrange the upper rolls with relation to the lower rolls so that the axes of the upper rolls will be located between the axes of the lower rolls. The first of the series of upper presser rolls is located vertically be-

tween the second and third lower presser rolls while between the first and second rolls of the lower series I arrange a dividing roll 21. This dividing roll 21 is mounted in bearings 5 in the side plates of the frame and is grooved longitudinally to provide a plurality of longitudinal ribs 22 as shown in Fig. 3. The said ribs 22 of the dividing roll are of such length that they almost reach the faces of the lower presser rolls between which they are located.

The devices for rotating the rolls are constructed as follows: A power shaft 23 is supported in suitable bearings in the side plates of the frame and is provided at one side of the machine with a gear pinion 24 that intermeshes with the gear pinions 5^a, and 6^a, on the ends of the lower presser rolls 5 and 6 thereby serving to drive said presser rolls in the same direction. The presser rolls 7, 8 and 9 are provided respectively with gear pinions 7^a, 8^a, and 9^a, that intermesh with intermediate gear pinions 7^b, 8^b, and 9^b. In this way it will be seen that all of the presser rolls are driven in the same direction.

The dividing roll 21 is provided at its end with a gear wheel 25 that intermeshes with the gear pinions 5^a and 6^a to cause the adjacent faces of the dividing roll 21 and the lower presser rolls 5 and 6 to move in the same direction. The lower presser roll 9 which is the last in the series is provided on its other end with a toothed wheel 26 that intermeshes with a toothed wheel 27 on the adjacent end of the upper presser roll 14 which is the last in that series whereby the upper presser roll 14 will be driven in an obvious manner. The wheels 26 and 27 have what I term elongated teeth to keep them in gear with each other when the roll 14 rises in its guides. In this way it will be seen that I form an expansion gearing between the rolls 9 and 14, so that said roll 14 will at all times be driven from roll 9.

The matter to be pressed is passed between the presser rolls between two or more folds 45 or layers of some fabric or porous material so that the greater part of liquid held by the latter will be pressed therefrom and through the porous layers between which it is held and will run down upon the bottom of the machine and then through the outlet pipe 4. It will be understood that various materials could be used to form these porous layers between which the substance is placed but it is found convenient and preferable to provide 55 a woven fabric such as canvas, duck and the like and a continuous belt 28 of such fabric is employed which is in width about three times the length of the presser rolls, so that as said belt passes between the said presser rolls it can be folded into three layers. Along both edges of said belt an enlargement 29 is formed conveniently by binding a cord or rope thereat. The said belt 28 passes over and through a frame or trough 30 at the forward end of the machine, between the presser rolls and over an extension 31 at the rear end

of the machine and thence underneath the machine and back to the end of the trough 30. At the outer end of the trough 30 is located a roller 32 over which the traveling belt passes and near the said outer end of the trough (Figs. 3 and 5) is secured a guide bar 33. This guide bar is located parallel with the bottom 34 and sides 35 and 41 of the trough with enough distance between the same to allow the passage of the traveling belt while near the upper edges of the sides of the trough the said guide bar is first bent inwardly and then outwardly upon itself, as shown at 36 and then is secured to the sides 80 of the trough. At the bend of the portion 36 an eye 62 is formed to receive the enlarged edge 29 of the traveling belt while the remaining portion is narrower and about the same distance apart or a little more than the thickness of the belt.

Near the sides of the trough 30 adjacent the end of the frame A two hooks that are formed by two pairs of grooved rollers 37 and 38 (Fig. 6) are located. One of these hooks or pair of rollers 37, is secured directly to the sides 35 of the trough, while from this side of the trough a cross bar 39 extends to the other side 41 of the trough and is then provided with a downwardly projecting end 40 located a little distance from such side 41 of the trough. The hook or pair of grooved rollers 38 is secured to the side of this downwardly projecting end 40 adjacent the side 35 of the trough. The said grooved rollers are located close enough together to permit the belt to pass between the flanged edges of the same so that the enlargement 29 of said belt will be located within the grooved portion of the rollers which receives the said enlargement on the edges of the belt and holds the same from lateral displacement but permits the longitudinal movement thereof. It will thus be seen that as the belt passes over the roller 38 at the end of the trough it will be held out against the sides of the trough by the guide bar 33 while the upper bent guide portion 36 thereof will turn each edge of the belt inwardly as shown. From this point the side of the belt that passes along the side 41 of the trough is led diagonally across the trough so that its enlarged edge 29 passes between the grooved rollers 37 at the side 35 of said trough thereby forming an upper layer 42 of said belt. At the same time that portion of the belt that is held by the guide 36 on the side 35 of the trough is led diagonally across the trough and its enlarged edge passes between the grooved rollers 38 located adjacent the side 41 of the trough thereby forming an intermediate layer 43. The sides of the said trough 30 are inclined toward each other as they approach the frame of the machine, so that the width of the said trough is the same as the machine where said trough and frame meet. It will thus be seen that whereas near the outer end of the trough, the belt is not wide enough to make two com-

plete layers across the trough, yet at the narrow or contracted end of the trough the belt is wide enough to form three complete layers. Said layers consist of an upper layer 42 extending from the side 35 of the trough (where the edge of the belt is held by the grooved rollers) to the other side 41 of the trough and then downwardly between the downward projection 40 of the cross bar 38 and the side 41 of the trough to the bottom 34 thereof, and from this point the middle portion of the belt extends across the bottom 34 of the trough to the side 35 thereby forming a lower layer 44. From the said side 35 of the trough the other edge portion of the belt extends between the cross bar 39 and lower layer 44 to the grooved rollers 38 between which its enlarged edge 29 is secured thereby forming an intermediate layer 43. It will thus be seen that the belt will then pass in this folded condition between the dividing and presser rolls in an obvious manner, and with the enlargement 29 on the edges of the belt located within the grooves 11 of the lower series of layers as clearly shown in Fig. 4.

Between the end of the trough and the first of the presser rolls are located idlers 45 and 46 that are mounted in suitable bearings on the side plate 1 of the machine. The faces of these idlers are concave and are located so that the belt rests thereon during its passage from the end of the trough to the presser rolls. It will be noted however, that the concavity of idler 46 is greater than that of idler 45 for a purpose to be fully explained hereinafter.

At the rear end of the frame A and located approximately in horizontal alignment with the lower presser rolls is located a separating idler 47 which is journaled between the side plates 1 of the machine. This separating idler is largest at its center and tapered toward both ends as shown in dotted lines in Fig. 2 or it may be convex, and it is across this roller that the traveling belt passes as soon as it leaves the last of the presser rolls.

The extension 31 at the rear end of the frame extends in about a horizontal line and consists of two arms 48 and 49 (Fig. 2). These arms extend outwardly and are provided respectively with two hooks or pairs of grooved rollers 50 and 51. After passing from between the last of the presser rolls the enlarged edge of the belt, that is located on the side of the machine adjacent the grooved rollers 50, is then led across the extension 31 diagonally and passes between the grooved rollers 51 in the groove of which the said enlargement is held in an obvious manner, while the enlargement that passes between the rolls on the other side of the machine and which forms the intermediate layer is led also diagonally across the extension and passes between the grooved rollers 50 with the enlargement secured by said groove. The plate then passes down beneath the machine and back to the

roller 32 at the outer end of the trough as shown. It will be noted that the belt is driven to a certain extent by the intermediate presser rolls but the main power for driving said belt is obtained by the last roll 14 of the upper series and the last roll 9 of the lower series which are geared together as heretofore described and thereby serve to impart a positive pull upon the belt, and it will also be noted that the dividing roll 21 also imparts to a certain extent a pull upon the belt, and in this way the belt is caused to travel between the rolls back beneath the machine as described.

The operation of my invention is as follows: Power being applied to the machine to drive the several rolls and traveling belt, the matter to be compressed is placed upon the belt at the outer end of the trough and will be carried forward by the belt in an obvious manner, and during this operation the belt is folded into three layers as described with the material resting upon the lower layer. As the material passes the inner end of the trough it is located simply between the intermediate layer 43 and bottom layer 44, while the upper layer 42 is held some distance above the same as shown in Figs. 3 and 6. The bottom layer then passes over the concave idlers 45 and 46 which have a tendency to shift the matter toward the center of the bottom layer so as to remove it from the edges thereof. The belt with the matter inclosed therein then passes between the dividing roll 21 and the two lower rolls 5 and 6 thus bringing the upper layer 42 down upon the intermediate layer and forcing the enlargement 29 of the edges of the belt into the grooves 11 of the lower rolls. The ribs 22 of the dividing roll serve to separate the matter upon the belt into sections so as to insure the passage of the same between the rolls it being noted that a smooth roll instead of the ribbed divided roll would in some cases have the effect of forcing the matter back upon the belt and thus prevent its passage between the rolls, but being divided by said dividing rolls the different sections of matter are compelled to pass forward as will be plainly obvious. The belt then carries the matter between the upper and lower rolls and the pressure exerted by said upper rolls 12, 13 and 14 upon the belt and matter contained therein will compress in such manner all liquid or moisture in an efficient manner, which liquid or fluid will be pressed through the porous belt and fall down upon the bottom 30 of the frame and then out through the outlet pipe 4 to be carried away. It will be noted in this connection that the strength of the springs 20 can be selected with reference to the amount of pressure desired and that while they will serve to keep the upper rolls with sufficient pressure upon the belt passing across the lower rolls they will allow the upper rolls to rise should any foreign matter or any matter of un-

usual thickness pass between the rolls. After the matter has passed between the rolls and has been compressed the layers of the belt are then separated in the manner described while the middle portion thereof passes through the separating idler 47 which serves to break up the mass of compressed matter upon the belt and thus loosens the same so that as the belt turns at the end of the extension 48 at the end of the machine the compressed matter will fall therefrom on to any convenient receptacle. It will thus be noted that I provide a press wherein the operation can be carried on continuously and in an exceedingly efficient manner and that the machine can be of durable construction while its simplicity insures a positive operation and reduces the liability of injury or damage to a minimum. It will be understood moreover that except in the claims for specific construction I do not wish to be understood as confining my invention to the exact parts and particular construction shown and described as I contemplate making all suitable changes and variations in such parts as will fall within the scope of the following claims.

I claim as my invention—

1. A press comprising a plurality of presser rolls, a ribbed dividing roll, gearing for driving said rolls, and a traveling belt or conveyer located between said rolls.

2. A press comprising a plurality of lower presser rolls, a plurality of upper presser rolls, a ribbed dividing roll, gearing for driving said rolls, and a traveling belt or conveyer located between said upper presser rolls and dividing roll and the lower presser rolls.

3. A press comprising a plurality of lower presser rolls geared to each other and to a source of power, a plurality of upper presser rolls and a dividing roll, said dividing roll and one of said upper presser rolls being also geared to said source of power, and a traveling belt or conveyer located between said lower presser rolls and said upper presser and dividing rolls.

4. The combination with the upper and lower presser rolls of a press, and gearing for driving the same, of a traveling belt or conveyer located between said presser rolls and having enlargements along its edges, devices for folding said belt or conveyer into a plurality of folds before it passes between said rolls, annular grooves in said rolls to receive said enlargements of the belt and devices for unfolding said belt or conveyer after it passes from between said rolls.

5. The combination with the upper and lower presser rolls of a press and gearing for driving the same, of a traveling belt or conveyer located between said presser rolls and having enlargements along its edges, devices for folding said belt into a plurality of folds before it passes between said rolls, annular grooves located near the outer ends of said lower rolls to receive said enlargements, and

devices for unfolding said belt or conveyer after it passes between said rolls.

6. The combination with the upper and lower presser rolls of a press and gearing for driving the same, of a traveling belt or conveyer located between said rolls, devices for folding and unfolding said belt or conveyer before and after passing between said rolls respectively and an idler that is smaller at its middle portion located in front of said presser rolls and adapted to support a section of the belt or conveyer.

7. The combination with the frame of a press, upper and lower presser rolls, and gearing for driving the same, of a traveling belt or conveyer having enlargements 29 on its edges and located between said rolls, a frame 30 in front of said rolls having an enlarged outer end, a guide bar 33 located near the outer end of said frame and away from the bottom and sides of the same, bends in said guide bar to receive the said enlargements of the belt, hooks on the sides of the frame and adjacent the rolls to receive said enlargements 29, and devices for unfolding said belt or conveyer after it passes between said rolls.

8. The combination with the frame of a press, upper and lower presser rolls, and gearing for driving the same, of a traveling belt or conveyer having enlargements 29 on its edges and located between said rolls, a frame 30 in front of said rolls having an enlarged outer end, a guide bar 33 located near the outer end of said frame and away from the bottom and sides of the same, said guide bar being bent inwardly and outwardly upon itself at each side of the frame and having an eye 62 at its bends to receive said enlargements 29, hooks on the sides of the frame and adjacent the rolls to receive said enlargements 29, and devices for unfolding said belt or conveyer after it passes between said rolls.

9. The combination with the frame of a press, upper and lower presser rolls, and gearing for driving the same, of a traveling belt or conveyer having enlargements 29 on its edges and located between said rolls, a frame 30 in front of said rolls having an enlarged outer end, a guide bar 33 located near the outer end of said frame and away from the bottom and sides of the same, a hook 37 on the side 35 of the frame and near the rolls to receive one of said enlargements 29, a cross bar 39 extending from said side 35 of the frame toward the side 41 thereof and provided with a hook 38 near said side 41 to receive the other of said enlargements 29, and devices for unfolding said belt or conveyer after it passes between the rolls.

10. The combination with the frame of a press, upper and lower presser rolls, and gearing for driving the same, of a traveling belt or conveyer having enlargements 29 on its edges and located between said rolls, a frame 30 in front of said rolls having an enlarged outer end, a guide bar 33 located near the

5 outer end of said frame and away from the bottom and sides of the same, bends in said guide bar to receive the said enlargements of the belt, a pair of grooved rollers 37 on the side 35 of the frame and near the rolls to receive one of said enlargements 29, a cross bar 39 extending from said side 35 of the frame toward the side 41 thereof and provided with a pair of grooved rollers 38 near said side 41

to receive the other of said enlargements 29, and devices for unfolding said belt or conveyor after it passes between the rolls.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES C. LOCKSTAEDT.

Witnesses:

HARRY COBB KENNEDY,
RUDOLPH W. LOTZ.