

April 21, 1959

D. W. VAN DOORN ET AL
CONTROL SYSTEM FOR BALING PRESSES AND
ASSOCIATED APPARATUS

2,882,816

Filed Nov. 16, 1956

5 Sheets-Sheet 1

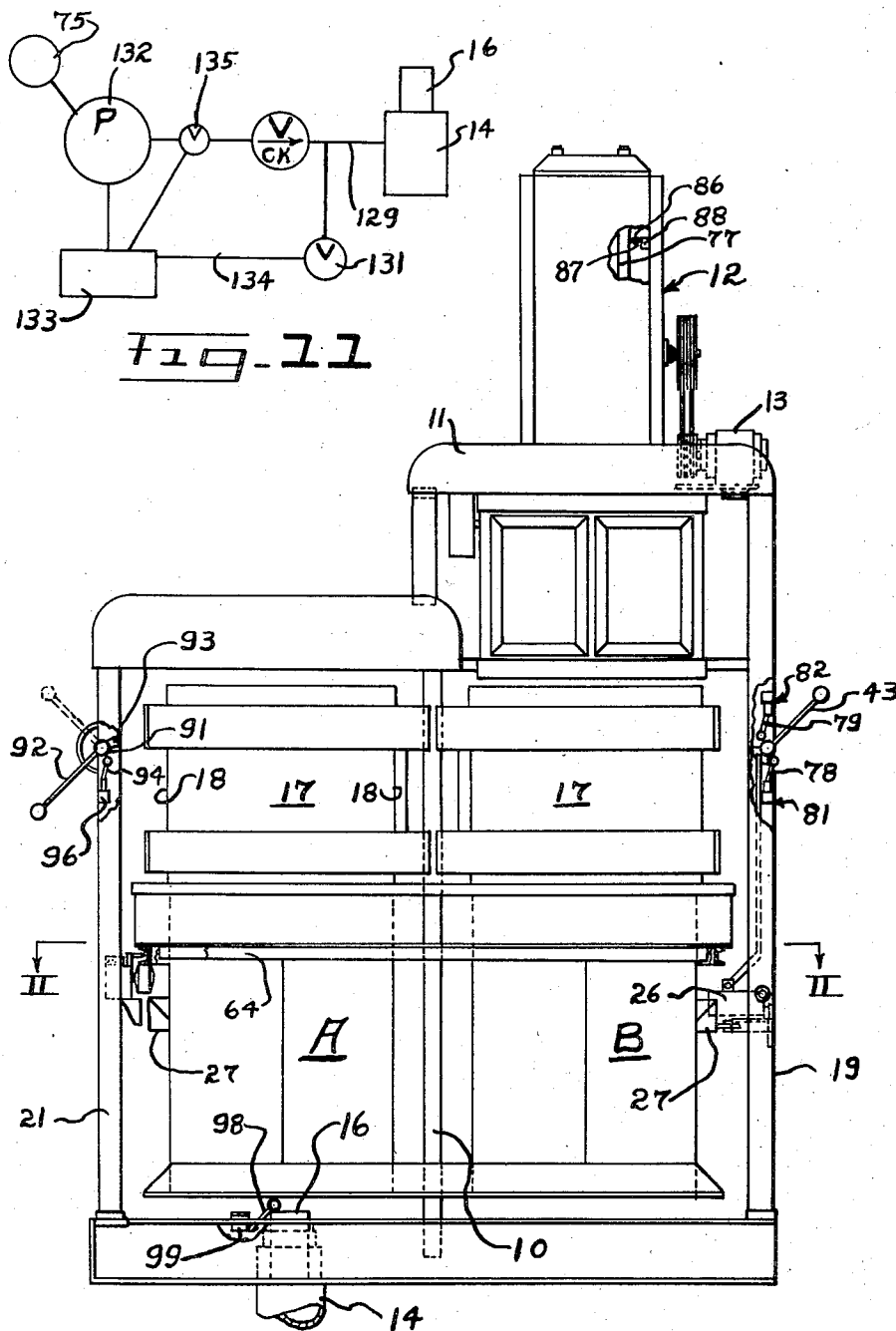


Fig. 1

INVENTOR.
Donald W. Van Doorn
William C. Pease III
BY
Jimmy, Carter & Thompson
Attorneys

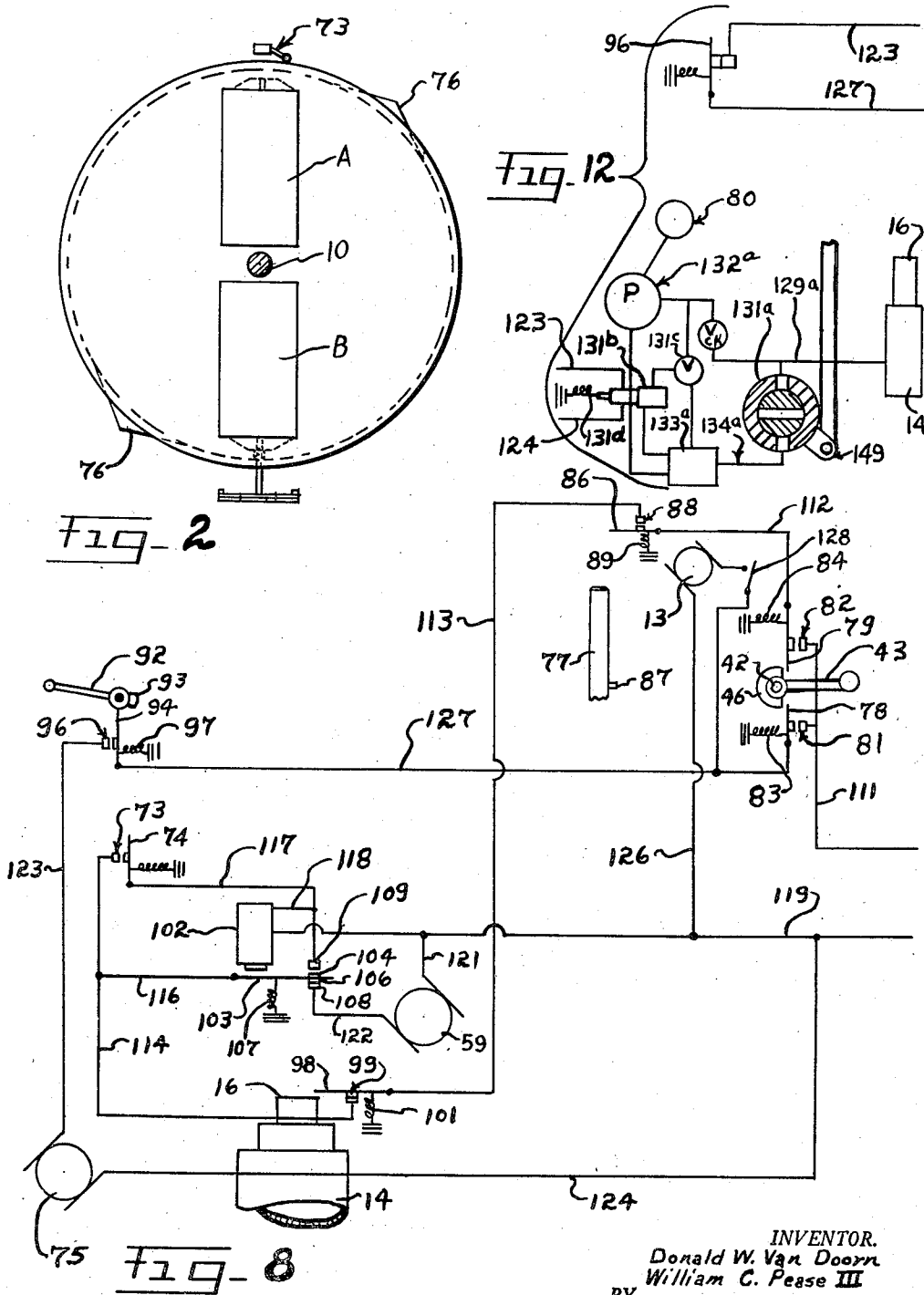
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5 Sheets-Sheet 2



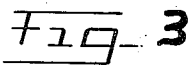
INVENTOR.
Donald W. Van Doorn
William C. Pease III
BY
Jennings, Carter & Thompson
Attorneys

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5 Sheets-Sheet 3



INVENTOR.
Donald W. Van Doorn
William C. Pease III
BY
Jennings, Carter & Thompson
Attorneys

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5 Sheets-Sheet 4

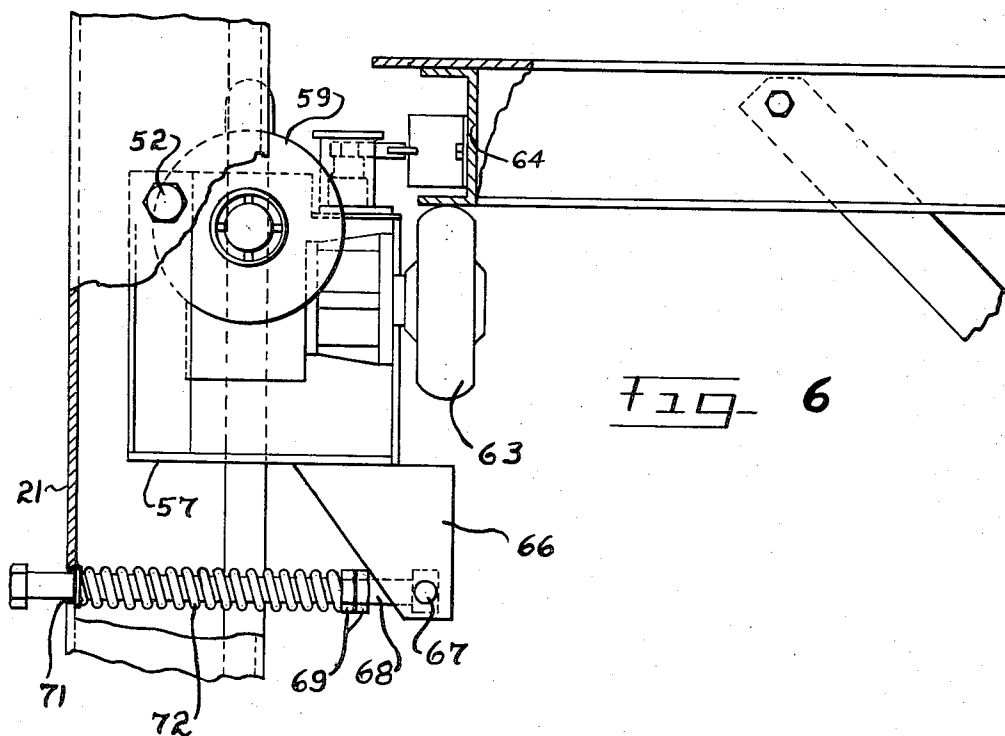


Fig. 6

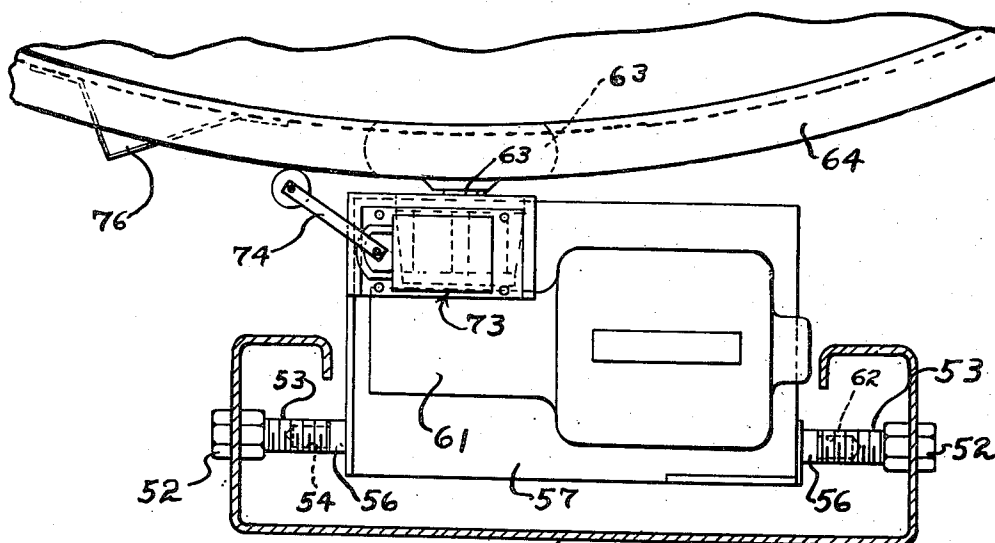


Fig. 7

INVENTOR.
Donald W. Van Doorn
William C. Pease III
BY
Jennings, Carter & Thompson
Attorneys

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5 Sheets-Sheet 5

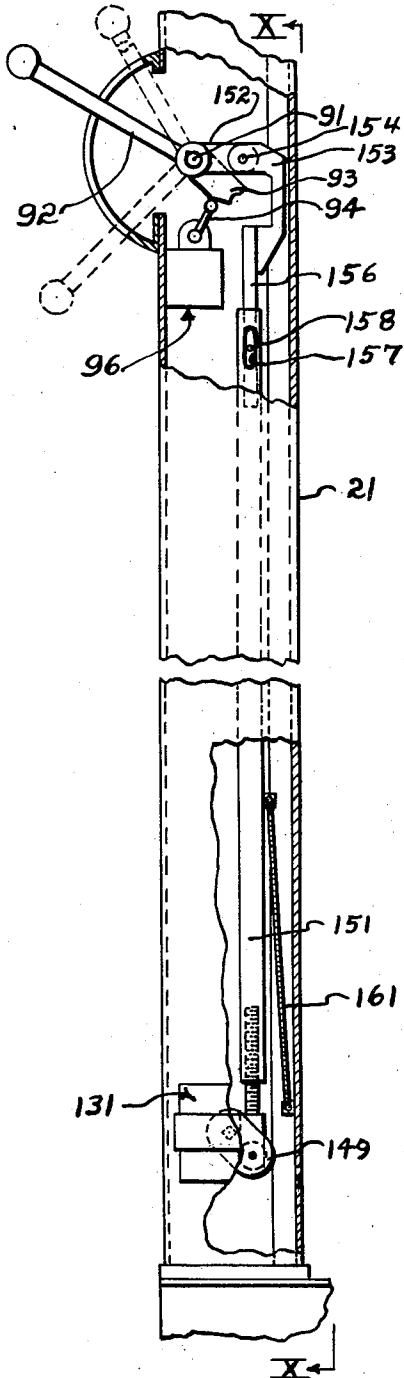


Fig. 9

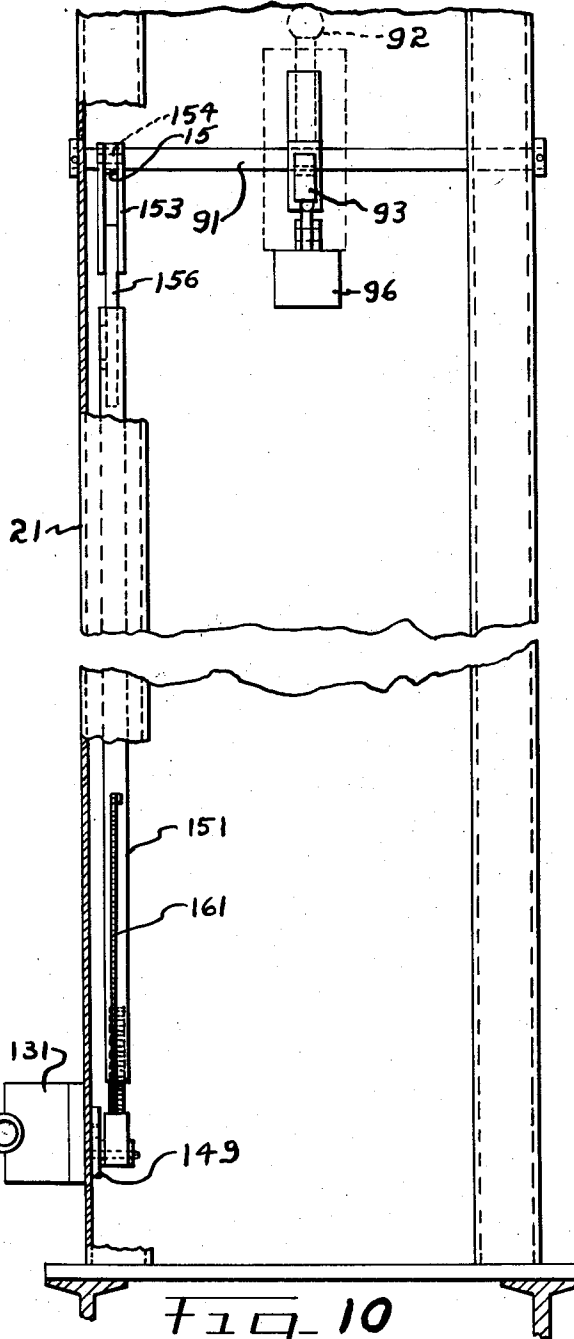


Fig. 10

INVENTOR.
Donald W. Van Doorn
William C. Pease III
BY
Jennings, Carter & Thompson
Attorneys

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2,882,816

CONTROL SYSTEM FOR BALING PRESSES AND ASSOCIATED APPARATUS

Donald W. Van Doorn and William C. Pease III, Columbus, Ga., assignors to Lummus Cotton Gin Company, a corporation of Georgia

Application November 16, 1956, Serial No. 622,606

22 Claims. (Cl. 100—53)

Our invention relates to fiber baling presses and associated apparatus and has for an object the provision of a completely mechanized, automatically operable baling press.

Heretofore in the art to which our invention relates it has been customary to provide baling presses for fiber such as those used in gin houses for the baling of cotton fibers in which the press box, for instance, was rotated by hand. Likewise, it heretofore has been customary to provide a plurality of levers or, manually controlled electric switches, for the operation of the fiber tramping apparatus and for the control of the pump motor controlling the fluid pressure supplied to the packing ram. It has been found that such prior presses require a considerable amount of effort, skill and caution in their operation inasmuch as the press would be damaged in the event the tramping was started at the wrong time, in the event the press was unlatched to permit the press boxes to turn from fiber receiving to fiber compressing position, or, in the event the ram was actuated at the wrong time.

In view of the foregoing it is a general object of our invention to provide an improved apparatus for baling fibers which embodies a double box press, either of the up packing or down packing type, and which has power driving means operatively associated therewith for rotating the press at the proper time, thereby to position the empty box under the fiber receiving part of the apparatus and to position the full box over the fiber packing apparatus.

A primary object of our invention is to provide a fiber baling press in which the time required to make each cycle and the labor required to operate the same is reduced to a minimum, thus increasing the output in bales per hour of the gin plant and reducing the labor required.

A further object of our invention is to provide a system of controls which are so interrelated and electrically and mechanically interlocked that it is impossible for the press apparatus to be operated except in the correct manner, thus eliminating damage to the press parts through improper operation of its several components.

Another object of our invention is to provide a baling press having the foregoing features in which the operation of a single handle is fully effective to initiate the entire sequence of operation of the press in rotating from fiber receiving position to fiber packing position.

Another object of our invention is to provide a system of controls of the character designated which may be used independently or, may be used in combination with the apparatus shown, described and claimed in a co-pending application, filed in the name of William C. Pease III, Serial No. 429,754, filed May 14, 1954, now Patent No. 2,764,932 issued October 2, 1956, subject Automatic Bale Density Mechanism for Fiber Presses and the Like, whereby, the fiber delivery or tramping part of the apparatus automatically moves to inoperative position, readying the remainder of the control circuits here-

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in to be described for operation to turn the press and pack the bale.

A further object of our invention is to provide a modified form of ram actuating mechanism which adapts our invention for use with baling presses having rams equipped with a continuously operating motor and pump system, the modified form of our invention embodying a manually actuated valve control for the ram pump system and an electric switch which de-energizes certain of the other parts of the apparatus, assuring that the press operates only in the prescribed manner.

Apparatus illustrating features of our invention is shown in the accompanying drawings forming a part of this application in which:

Fig. 1 is a front elevational view of a double box, up-packing baling press to which our invention is applied, certain of the parts being broken away and in section;

Fig. 2 is a wholly diagrammatic small scale sectional view taken generally along line II—II of Fig. 1;

Fig. 3 is an enlarged fragmental detail view, partly in section, of the press box latch mechanism and operating handle and switches therefor shown at the right hand side of said Fig. 1;

Fig. 4 is a fragmental detail sectional view taken generally along line IV—IV of Fig. 3;

Fig. 5 is a detail sectional view taken generally along line V—V of Fig. 4, partly broken away;

Fig. 6 is an enlarged fragmental view showing the power driving mechanism, for rotating the press box;

Fig. 7 is a fragmental plan view of the mechanism shown in Fig. 6;

Fig. 8 is a wholly diagrammatic wiring diagram;

Fig. 9 is an enlarged fragmental detail sectional view of the ram pump valve and safety switch operating mechanism;

Fig. 10 is a fragmental elevational view of the apparatus shown in Fig. 9, the view being taken generally along line X—X of Fig. 9;

Fig. 11 is a wholly diagrammatic view of a hydraulic line and valve diagram of the ram pump mechanism; and

Fig. 12 is a wholly diagrammatic wiring and hydraulic line showing a modified form of our invention.

Referring now to the drawings for a better understanding of our invention, we show in Fig. 1 a double box press of the up-packing type. As is well understood, this type of press embodies a pair of press boxes A and B which are mounted for rotation about a heavy central column 10. Mounted on a frame 11, in position to receive fiber and pack the same into the press box therebeneath is a tramping apparatus indicated generally by the numeral 12. The moving parts of this apparatus are driven by a motor 13. Mounted beneath the other box of the press is a heavy duty ram 14 having an upwardly movable piston rod 16 which engages a platen to push upwardly on the fiber in the box lettered A, thus to pack it and form the bale. The bale is removed through the doors which are indicated diagrammatically as the side doors 17 and end doors 18, which may be opened as is well understood in the art.

From a general consideration of Fig. 1 it will be apparent that the tramping 12 embodies a tramping foot which enters into the box therebeneath. It will further be apparent that the piston 16 of the ram 14 must enter into the box over the same. Thus, it would be disastrous and would completely ruin either the tramping or the press or the ram, or all of them, if the ram were to be in up position while the press boxes were being rotated. Likewise, if they were partially rotated and the ram moved upwardly the tremendous force would wreck the press. The latter is true also of the tramping foot. There-

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fore, it is essential to the safe operation of the press that neither the tramper 12 nor the ram 14 operate except during those periods when the press boxes are safely locked in the position shown in Fig. 1, except, of course, when the boxes A and B change places. Our invention therefore contemplates means to correlate the rotation of the press boxes to their proper positions with the filling of the press box with loose fiber and the packing of the bale, all in such manner that these mechanisms operate only at the proper time, thereby to eliminate likelihood of injury to the parts of the apparatus.

It will be understood that there are vertical columns 19 and 21 which form stationary frame structures for the press parts and which serve to support many of the operating parts, controls and latches. As shown in Figs. 3, 4 and 5, we mount between the flanges of one of the columns 19 a pin 22 which may be held in place by collars and cotter pins and the like 23. Pivotaly mounted over the pin 22 is a sleeve 24. Welded to the sleeve 24 is a latch plate 26 which, as will be explained, serves to latch the rotatable press box in operating position. A suitable reinforcing plate 25 is welded to the top of the plate 26, as shown.

On the ends of the press boxes A and B are cam actuating members 27. Mounted in the bifurcated end 28 of a rod-like member 29 is a roller 31 which is adapted, when the press boxes are in the position shown in Figs. 1 to 5 inclusive, to ride upon the cam members 27, and to come to rest upon a flat portion 27a at the apex thereof. The member 29 is slidably received in a housing 32 which has a slot 33 extending for a distance axially thereof as indicated in the drawings. The member 29 is drilled at its end opposite the roller 31 thereby to provide a recess for a compression spring 34. The housing is mounted to the column 19 by means of a flange 36 and bolts and nuts therefor 37.

Adapted to slide in the slot 33 is a detent or block 38 which is welded to the top of the rod member 29 and which is adapted to engage the rear edge 26a of the latch plate 26. It will thus be apparent that whenever the roller 31 is engaged upon the raised surface 27a of the cam member 27, the block 38 is moved to the right as viewed in Fig. 2, thus permitting the latch plate to move downwardly. In this downward position the free end of the latch plate 26 engages in a notch 27b in the latch plate 27. It will also be noted that the plate or cam member 27 slopes both ways, that is, it slopes so that it raises the latch plates in the event it is down when the press is turning and the member 27 comes therebeneath, and also that the member 27 is sloped in such manner as to cam the roller 31 backwardly, substantially at the same time that the plate is permitted to lower.

From what has been so far described it will be seen that whenever the latch plate 26 is down it engages in the notch 27b, thus to lock the press positively and mechanically against rotation.

Mounted on a pin 42, at a higher elevation in the column 19 than the pin 22, is an operating handle 43 which serves a dual purpose. Carried by a boss 44 of the handle 43, which surrounds the pin 42, is a plate 46. Pivotaly connected to the plate 46 as at 47 is a rod 48. The rod extends all the way down to the latch plate 26 where it is pivotaly connected at 49 to a bracket 51 upstanding from the latch plate 26. Therefore, it will be readily apparent that by pulling downwardly on the handle 43 the latch plate 26 is raised. The other functions of the handle 43 will be later described in connection with the electrical circuits involved and switches therefor.

Referring now to Figs. 6 and 7, we will now describe the power driving mechanism for rotating the press box. Mounted in the flanges of the post 21 and held therein by nuts 52 are threaded studs 53 which have drilled inner ends 54. Projecting into the drilled inner ends 54 are

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the reduced ends of studs 56. The studs 56 project outwardly from the ends of a frame 57, which as shown, may be an L-shaped bracket part with end plates welded thereto. Mounted on the frame 57 is an electric motor 59 which drives a reduction gear box 61 having thereon an output shaft 62. Mounted on the output shaft 62 and driven thereby is a friction roller which may be in the form of a rubber covered roller or wheel 63. The wheel 63 engages beneath the flange of a circular channel 64 which forms a part of the rotating press box assembly.

Depending from the frame 57 is a plate 66. Pivotaly connected to the plate 66 at 67 is one end of a bolt 68 having nuts 69 thereon adjacent the pivoted end thereof. The bolt passes loosely through a hole 71 in the flange of the column 21. Interposed between the flange of the column 21 and the nuts 69 is a compression spring 72. Due to the pivotal mounting of the entire frame 57 on the studs 53, the spring 72 urges the roller 63 into driving frictional engagement with the underside of the circular channel 64. Therefore, whenever the motor 59 is energized the press box is rotated about the supporting column 10 by the frictional engagement of the driving roller 63 with the ring channel 64.

Mounted on the plate framework 57 of the parts just described is a normally open electric switch 73 having a roller equipped switch arm 74. Mounted on the ring channel 64, substantially diametrically opposed to each other, are V-shaped cams 76 which momentarily engage the roller in the end of the switch arm 74 as the press box rotates, thereby momentarily to close the switch 73 for a purpose later to appear.

Referring now more particularly to Figs. 8 and 11 of the drawings we will now describe the control circuits for our improved apparatus. It will be understood that the modification now being described embodies an electric motor 75 which drives a fluid pressure pump 132 which supplies fluid under pressure from a reservoir 133 to the hydraulic ram 14. Thus, whenever the motor 75 is energized fluid under pressure is being supplied to the bottom of the ram 14 and its piston 16 is rising. In like manner it will be appreciated that whenever the motor 13 is operating the vertically movable parts of the tramper, one part of which is indicated at 77, are moving up and down, into the box A or B beneath the tramper 12, thereby to pack cotton into the box under the tramper.

Mounted on the column 19, in position for the arms 78 and 79 thereof to be engaged by the plate member 46 of the handle 43 are normally open electric switches indicated generally by the numerals 81 and 82. The switch 81 is biased to open position by a spring 83 whereas the switch 82 is biased to open position by a spring 84. Thus, whenever the arm 43 is moved upwardly the lower end of the plate 46 engages the switch arm 78 and closes switch 81, at the same time permitting spring 84 to open switch 82. Conversely, when the arm 43 is moved downwardly the upper end of the plate 46 engages the arm 79, closing switch 82 and at the same time permitting spring 83 to open switch 81.

Mounted on a suitable part of the framework of the tramper mechanism 12 in position for an arm 86 thereof to be struck by a lug 87 on the vertically reciprocating part 77 of the tramper mechanism is a normally open electric switch 88 which is biased toward a normally open position by spring 89. Thus, when the movable part 77 of the tramper is at raised position and out of alignment with the rotating parts of the press; namely, when the tramper foot is removed from the press box, switch 88 is closed.

Pivotaly mounted on the column 21 is a rod 91 which carries a manual switch control arm 92. Secured to the rod 91 is a bracket or lug 93 which is adapted to engage the switch arm 94 of a normally open electric switch

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96 which is biased toward normally open position by a spring 97. The switch 96 is closed when the handle 92 is in its uppermost position.

As shown in Fig. 11, the ram 14 is supplied with fluid under pressure from the pump 132 through a line 129 having a check valve therein. Fluid is supplied to the pump 132 by reservoir 133 which in turn is in communication with the line 129 by a line 134 having a control valve 131 therein. A suitable pressure relief valve 135, which is in communication with reservoir 133, may be provided between the pump and the check valve, as shown in Fig. 11. As shown in Figs. 9 and 10 the valve 131 is actuated by an arm 149 which is connected through a pull rod 151 to a bracket 152 rigidly mounted on the rod 91. This connection is made by means of bracket arms 153 pivoted at 154 to the bracket 152. The bracket arms 153 carry a depending pin 156 which slides in the drilled upper end of the rod 151. The upper end of the rod 151 is provided with an elongated slot 157 and the pin 156 carries an outstanding pin 158 which slides in the slot 157 as limited by the length thereof. A spring 161 connects the rod 151 to the column 21, as shown, and assists the weight of the rod 151 in lowering or rotating the arm 149 clockwise in closing the valve 131 as the operating handle 92 is raised from its lower position to its intermediate position. The bracket 152 does not force the rod 151 downward as the arm handle 92 is raised to its intermediate position due to the fact that the pin 158 moves to the top of the slot 157.

Mounted on a suitable part of the framework, in position for its arm 98 to be struck by the up-moving piston 16 of the ram 14 is a normally closed electric switch 99 which is urged toward normally closed position by a spring 101.

Mounted at any suitable location on the apparatus is an electric magnet 102 which has a movable switch contact arm 103 carrying contact points 104 and 106. A spring 107 biases the arm to a position with the contact point 106 in contact with a stationary contact 108, and out of contact with a stationary contact 109.

One power supply line 111 is connected to stationary contacts of the switches 81 and 82. The movable contact of switch 82 is connected by a line 112 to the movable contact arm of the switch 88. The other contact of the switch 88 is connected by a line 113 to the movable contact arm of the switch 99. The other side of switch 99 is connected by a line 114 to the stationary contact of the switch 73. A branch line 116 connects the line 114 to the electro-magnet controlled switch arm 103. A line 117 connects the movable switch arm of the switch 73 to the contact point 109. A branch line 118 connects the line 117 to one contact of the winding of the electro magnet 102. Power is supplied to the electro magnet through a line 119. One side of the turning motor 59 is connected to the power line 119 by a branch line 121 while the contact point 108 is connected by a branch line 122 to the other side of the turning motor 59.

The stationary contact of switch 96 is connected by a line 123 to one side of a pump motor 75 and the other side of the pump motor 75 is connected by a line 124 to the power supply line 119.

The tramper motor 13 is connected across the power line 119 by a line 126 and to the movable contact of the switch arm 96 by a line 127.

From the foregoing the method of constructing and using the modification of our improved baling press apparatus so far described may now be explained and readily understood. With the parts constructed and arranged as illustrated, it will be apparent that the tramper motor 13 may be controlled by a manually operated switch 128 (shown diagrammatically in Fig. 8) or, it may be automatically controlled by means of the mechanism shown, described and claimed in the copending application hereinabove identified. For the sake of illustration

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herein it will be assumed that the switch 128 is opened manually at a time when the moving part 77 of the tramper is in raised position, with the lug 87 in contact with the switch arm 86, closing switch 88. It will be assumed that the box under the tramping apparatus now has been filled with cotton, that the piston 16 of the ram 14 is in lowered position with switch 99 closed, that the operating handle 43 is in its raised position as shown in Fig. 1, with switch 81 closed and switch 82 open, and with the operating handle 92 in its lowered position with switch 96 open. Starting with the parts in the position just set forth, as soon as the tramper is stopped, the press boxes are now ready to be rotated to bring the box which is under the tramper and full of loose, unpacked cotton, over the ram, and to place the now empty box under the tramper. This is accomplished by pulling downwardly on the lever 43, opening switch 81 and closing switch 82. This establishes a circuit from the line 111, through switch 82, through switch 88, through switch 99, to the contact arm 103, through the contacts 106—108 thence to the motor 59 and through line 121 back to the other power line 119. It will be noted that lowering the handle 43 has lifted the latch 26 out of the notch 27b of the cam member 27. The press continues to turn until the cam 76 approaches the switch 73 and strikes the limit switch arm 74 to close switch 73. This energizes the electro-magnet 102, opening contacts 106—108, de-energizing the turning motor 59. Energization of the electro magnet 102 closes the normally open contacts 104—109 establishing a holding circuit through the branch line 118 to keep the electro-magnet 102 energized and the turning motor 59 de-energized, after the switch 73 has returned to normally open position. The gear box 61 decelerates the rotating part of the press and the inertia of the turning press allows it to continue rotation until the mechanical latch plate 26 falls by gravity into place in the approaching locking plate mechanism 27, stopping the press in the proper position. Due to the deceleration by the gear box 61, the rotating part of the press is stopped by the latch without undue shock. When the mechanical latch plate moves into the notch it will be apparent that the operating handle 43 moves upwardly, opening the contacts of switch 82, closing the contacts of switch 81. This de-energizes the electro magnet 102. With the normally open switch 81 now closed the pump operating handle 92 may now be raised, closing switch 96 and rotating arm 152 which in turn lowers rod 151 and rotates arm 149 to its lower position thus closing valve 131 and preventing fluid from returning to reservoir 133. Closing the switch 96 also starts the pump motor 75, thus raising the piston 16 of the ram 14 to pack the bale. As soon as the piston moves upwardly sufficiently to be inside the box, switch 99 opens, thus making ineffective the accidental closing of switch 82 to set the turning apparatus in operation. To stop the ram the handle 92 is lowered to its intermediate position shown in solid lines, thus opening switch 96 which stops the pump motor stopping the flow of fluid to the ram. Because of the slot 157 in shaft 151, the valve 131 is not actuated when handle 92 is moved from its upper position to its intermediate position.

To lower the ram 14, the handle 92 is moved to its lower position which turns arm 152 counterclockwise raising pin 158 in slot 157 of rod 151. As pin 158 reaches the top of slot 157 rod 151 rises with the bracket arm 153, shifting arm 149 counterclockwise and opening valve 131. This allows fluid in the ram 14 to flow back to reservoir 133 whereupon the ram moves to its bottom position.

It will be noted that the ram cannot be operated unless switch 81 is closed. Therefore, the accidental closing of switch 96 does not affect the safe operation or sequence of operation of the apparatus. In fact, handle 92 can be raised before the completion of a turning cycle, prior to the raising of handle 43, whereby upon the

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raising of handle 43 due to the latch plate falling into the notch 27b, the pump motor 75 is energized, thus making the press automatic in the sense that the pump commences to raise the ram 14 immediately the press locks itself after having completed the turning operation. Furthermore, due to the switch 88 associated with the trumper, it is impossible to commence the rotation of the press if the trumper foot is within the box. Therefore, our improved apparatus embodies not only a mechanical but an electrical interlock system to assure correct operation at all times.

The modification of our invention shown in Fig. 12 is intended for use with those types of presses in which the pump runs continuously at all times. In this instance the ram 14 having the cylinder 16 is supplied with fluid under pressure through a line 129a from a pump 132a driven by a suitable source of power indicated at 80. Fluid is supplied to the pump from a reservoir 133a and there is a return line 134a, having a control valve 131a therein, which connects the line 129a with the reservoir. Thus, with the valve in the position shown, fluid is being supplied from the reservoir 133a through the pump to the line 129a and thence to the ram 14. When the operating handle 92 is shifted downward the arm 149 is shifted upwardly whereby the porting is such as to connect the high pressure side of the pump through the valve 131a to the line 134a which leads back to the reservoir, by-passing the ram. At the same time fluid flows backwardly in the line 129a from ram 14 through valve 131a to reservoir 133a due to the downward pressure of cylinder 16. The high pressure side of the pump 132a is also in communication with the reservoir 133a by a solenoid actuated valve 131b and a pressure relief valve 131c, as shown. The solenoid for the valve 131b is connected to the switch 96 by the leads 127 and 123. The solenoid valve 131b is in effect thus substituted in the circuit for the pump motor 75 shown in Fig. 8. The valve 131b is urged toward open position by a spring 131d.

With the parts constructed and arranged as shown in Fig. 12 it will be apparent that whenever the handle 92 is in its uppermost position as shown by the dotted lines as in Fig. 9 the switch 96 is closed whereupon the solenoid actuated valve 131b is moved to a position to block the flow of fluid back to the reservoir thus supplying fluid under pressure from the pump 132a to the ram 14, thus raising its piston 16. To stop the ram the handle 92 is moved to the position shown in full lines in Fig. 9 whereby the switch 96 is open and the solenoid operated valve 131b is opened by spring 131d to by-pass fluid from the pump back to the reservoir 133a. Any amount of fluid that might be in the ram 14 is thus held therein by the check valve which is positioned between the pump and the ram. To lower the ram, handle 92 is moved to its lowermost position whereby the switch 96 is open and the valve 131a is in position to drain fluid back from the ram 14 to the reservoir. The modification of the invention just described thus has an electrical interlock which prevents accidental operation of any of the other parts of the apparatus until the proper time, which is combined with a mechanical valve actuating means. Therefore, the power supply 80 may run continuously as is the case in some systems.

From the foregoing it will be apparent that we have devised an improved baling press which embodies power means for rotating the same and in which such power means is interlocked electrically and mechanically to prevent injury to the press and its associated apparatus thereby eliminating the likelihood of operating any of the mechanism other than in its proper and intended manner.

In actual practice our invention has proved to be satisfactory in every respect. The frictional connection afforded by the friction wheel 63 and the channel ring 64 of the press boxes affords a safe driving connection and

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one which is free of shocks in starting and stopping. Also, due to the fact that the leverage is so great where the wheel 63 contacts the periphery of the rotating part of the press, a much smaller driving unit can be employed. Furthermore, the friction drive at the periphery of the rotating part of the press operates automatically to prevent overload of the driving unit. It will be appreciated that the cams 76 are so located relative to the switch 73 that the inertia of the press causes the same to coast past the point where the switch 73 is engaged by the cam 76, whereby the latch plate 26 drops into the slot 27b smoothly and evenly without undue shock. By providing the latch plate releasing means embodying the roller 31 and the lug 38, it is not necessary for the operator to hold the arm 43 down continuously during the rotation of the press, it being sufficient only that he hold it down long enough for the press to rotate so that the notch 27b is past the plate 26 whereupon the spring 34 pushes the lug 38 outwardly, holding the latch plate and the arm 48 upwardly until the roller engages the oncoming cam member 27. Therefore, the switch 82 is held automatically closed until such time as the latch plate is permitted to move downwardly, thus to lower the link 48 and to rotate the arm 43. It also will be noted that this automatically opens the switch 81, there thus being no intermediate position for the arm 43.

While we have shown our invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. The combination with a fiber baling press having a press box movable from a position to receive fiber from fiber supply apparatus to a position for fiber in the box to be compressed by a ram or the like, of power driven means to move the press box from one of said positions to the other, mechanical latch means for positively latching the press box against movement when in said positions, electrical control circuits including a first switch for energizing the power driven means, a common manual control means for said latch means and said first switch effective when moved to one position to unlatch the press box and to close said switch thereby to energize the power driven means and move the press box, and other electric switches in said circuits effective to render ineffective the closing of said first switch when any parts of either said fiber supply apparatus or said ram are in the path of movement of the press box.

2. The combination set forth in claim 1 in which additional electric switches are provided in said circuits effective automatically to de-energize the press box power driven means upon completion of movement of the box from one of said positions to the other.

3. Apparatus as defined in claim 1 in which said manual control means is movable between a position to close said first switch and a position to maintain said first switch open, and the press box carries cam-like latch plate engaging members effective upon arrival of the press box at said positions automatically to move said manual control means to a position to open said first switch thereby to deenergize said power driven means and to latch the press box.

4. The combination recited in claim 16 including a manual control for energizing said ram embodying a ram energizing electric switch and circuits therefor, and another electric switch in said circuit in series with said ram switch which is closed only when the press box is latched, whereby the closing of the ram control switch is effective to cause the ram to compress the fiber only when the press box is latched.

5. The combination with a fiber baling press having tramping apparatus and a packing ram together with a

press box rotatable from fiber receiving position beneath the tramping apparatus to fiber packing position, of an annular member surrounding said press box and rotatable therewith, a power driven wheel in frictional engagement with said annular member for rotating said annular member whereby the press box moves from one of said positions to the other, mechanical latch means for positively latching the press box against movement when in said positions, electrical control circuits including a first switch for energizing the power driven wheel when closed, a common manual control means for said latch and said first switch effective when moved to one position to unlatch the press box and to close said switch thereby to energize the power driven wheel and rotate the annular member, and other electric switches in said circuits effective to render ineffective the closing of said first switch when any parts of either the packing ram or said tramping apparatus are in the path of movement of the press box.

6. The combination set forth in claim 5 in which the baling press includes a second press box rotatable with said first mentioned press box to define therewith a double press box structure.

7. The combination set forth in claim 5 in which resilient means urges the power driven wheel into engagement with the annular member.

8. The combination set forth in claim 5 in which the wheel is driven by a motor through a reduction gear box whereby upon deenergizing the motor the rotating part of the press is decelerated and stopped without undue shock.

9. The combination with a fiber baling press having tramping apparatus and a packing ram together with a press box rotatable from fiber receiving position beneath the tramping apparatus to fiber packing position, of power driving means to move the press box from one of said positions to the other, cam members mounted on the rotatable part of the press, a latch member mounted for pivotal movement on a stationary part of the press and adapted to engage said cam members to positively latch the press box against movement when in said positions, electrical control circuits including a first switch for energizing the power driving means when closed, a common manual control operatively connected to said latch member and said first switch effective when moved to one position to close said switch thereby to energize the power driven means and move the press box and to move the latch member out of engagement with the adjacent cam member to unlatch the press box, and other electric switches in said circuits effective to render ineffective the closing of said first switch when any parts of either the tramping apparatus or the packing ram are in the path of movement of the press box.

10. The combination set forth in claim 9 in which said other switches comprises a normally open switch in series with said first switch and associated with the tramping apparatus and being closed upon movement of the tramping apparatus out of the path of movement of the press box to allow energizing of the power driven means, and a normally closed switch in series with said first switch and associated with the packing ram and being opened upon movement of the packing ram into the path of movement of the press box to prevent energizing of the power driven means.

11. The combination set forth in claim 9 in which the latch member comprises a vertically extending plate pivotally mounted at one end to the stationary part of the press, there being a recess in the cam members for receiving said plate when in register therewith.

12. The combination set forth in claim 11 in which resilient means urges the latch plate toward raised position when not in register with a cam member.

13. The combination with a fiber baling press having tramping apparatus and a packing ram together with a press box rotatable from fiber receiving position beneath the tramping apparatus to fiber packing position, of power

driving means to move the press box from one of said positions to the other, cam members mounted on the rotatable part of the press, a latch plate mounted for pivotal movement on a stationary part of the press and adapted to engage said cam members to positively latch the press box against movement when in said positions, a resilient member urging said latch plate toward raised position when said latch plate is out of register with a cam member, means associated with said resilient member and adapted to engage a cam member as the latch plate registers therewith to render ineffective said resilient member whereby the latch plate is free to move into engagement with the cam member, electrical control circuits including a first switch for energizing the power driving means when closed, a control arm operatively connected to said latch plate and said first switch effective when moved to one position to close said switch thereby to energize said power driving means and to move the latch out of engagement with the adjacent cam member to unlatch the press box, and other electric switches in said circuits effective to render ineffective the closing of said first switch when any parts of either the tramping apparatus or the packing ram are in the path of movement of the press box.

14. The combination set forth in claim 13 in which the resilient member comprises a rod-like member, a roller at one end of said rod-like member adapted to engage a cam member, a spring urging said rod-like member toward the cam member, and a detent carried by said rod-like member and disposed to engage the latch plate and urge the same toward raised position when the roller is out of engagement with the cam member.

15. The combination set forth in claim 13 in which the contact surfaces of the cam members are sloped to facilitate movement of the latch plate into locking position.

16. The combination with fiber baling apparatus of the kind having a fiber box to receive fiber from a fiber supply source together with fiber tramping and fiber compressing apparatus, of a fluid pressure operated ram for packing the fiber in the box and having a piston movable from a position wholly without the box to a position therein, a constant supply of fluid under pressure, a supply conduit leading from the fluid supply to the ram and adapted to supply fluid to the ram, a check valve in said conduit, a normally open electrically closeable by-pass valve connected to said conduit on the pressure side of the check valve effective when open to by-pass the fluid under pressure and prevent it from flowing to the ram, a manually operated by-pass valve connected to said conduit on the ram side of said check valve and effective when open to drain fluid from the ram, electric circuits in which are included the electrically closeable by-pass valve, a normally open switch in said circuits effective when closed to close the electrically closeable valve, a common manual control for said switch and said manually operated valve operable to close said electric switch only when the manually operated valve is closed and to open said electric switch when the manually operated valve is opened, whereby fluid may be supplied to the ram or, selectively, may simultaneously flow through the open by-pass valve and drain from the ram through the open manually controlled valve and a second switch in series with said first switch and said bypass valve and operable to render ineffective manipulation of said manual control.

17. The combination with fiber baling apparatus of the kind having a fiber box to receive fiber from a fiber source and a vertically movable ram adapted to enter the press box to compress fiber therein, of means supplying fluid to said ram to move the ram vertically on its packing stroke, electrical circuits for actuating said fluid supply means and including a normally open switch, valve means controlling the flow of fluid for removing the ram from the press box, a manually operated control device for actuating said normally open switch and operatively con-

nected to said valve means for actuating said valve means to control the flow of fluid for removing the ram from the press box, said control device being effective in one position to close the switch for moving the ram vertically on its packing stroke and being effective in another position to open the switch and thereby stop the movement of said ram while maintaining fluid pressure on said ram, and said control device being effective in a third position to actuate said valve means to control the flow of fluid for removing the ram from the press box.

18. In a fiber baling press having a press box and a vertically movable ram associated with the press box for packing fibers therein, a fluid reservoir, pump means supplying fluid to said ram from said reservoir for moving said ram vertically, valve means interposed between said ram and said reservoir and controlling the flow of fluid for removing the ram from the press box, electrical control circuits including a normally open switch for energizing said fluid supply means when in closed position, a manually operated control device for actuating said switch and being operatively connected to said valve means for actuation thereof to control the flow of fluid for removing the ram from the press box, said manually operated control device being shiftable between three positions, one of said three positions maintaining said switch closed for energizing said fluid supply means to move the ram into the press box, the second of said positions being to open said switch for deenergizing said fluid supply means and maintaining fluid pressure on said ram thereby holding said ram in a substantially fixed position within the press box, and the third of said positions being to maintain said switch open for deenergizing said fluid supply means and to actuate said valve means to control the flow of fluid for removing the ram from within the press box.

19. In a fiber baling press having a press box and a vertically movable ram associated with the press box for packing fibers therein, a fluid reservoir operatively connected to said ram, means supplying fluid to said ram from said reservoir for moving said ram vertically, valve means interposed between said ram and said reservoir shiftable between a position stopping the flow of fluid from said ram to said reservoir and a position allowing the flow of fluid from the ram to the reservoir, electrical control circuits including a normally open switch for energizing said fluid supply means, a manually operated control device for actuating said switch and being operatively connected to said valve means for moving said valve means between said positions, said manually operated control device being shiftable between three positions, one of said positions maintaining said switch closed to energize said fluid supply means and thereby allow flow of fluid to said ram for moving said ram into the press box and maintaining said valve means closed to prevent the flow of fluid from said ram to said reservoir, the second of said control device positions being to open said switch for deenergizing said fluid supply means and to maintain said valve means closed thereby holding said ram in a substantially fixed position within the press box, and the third of said positions being to open said switch for stopping the flow of fluid to said ram and to open said valve means thereby allowing fluid to flow from said ram to said reservoir for movement of said ram from the press box.

20. In combination, a fiber baling press having a press box movable from a position in which it is being filled with fiber to another position in which the fiber is being packed, a vertically movable ram for packing fibers in said press box, power means to move the press box from one position to the other, mechanical latch means for positively latching the press box against movement when

in said positions, electrical control circuits including a first normally open switch adapted to energize the power means when closed and thereby move the press box, means to supply fluid to said ram for moving said ram vertically, electrical control circuits including a second normally open switch adapted to actuate said fluid supply means when closed thereby to supply fluid to said ram, and a manually operable control device shiftable between positions to actuate said first and second normally open switch, said control device being shiftable in one direction to close said first normally open switch thereby energizing said power means and being shiftable in another direction to close said second normally open switch while permitting said first switch to open thereby allowing said fluid supply means to move said ram and said power means to be deenergized.

21. In combination, a fiber baling press having a press box movable from a position in which it is being filled with fiber to another position in which its fiber is being packed, a vertically movable ram for packing fibers in said press box, power means to move the press box from one position to the other, electrical control circuits including a first normally open switch adapted to energize the power means when closed and thereby move the press box, means to supply fluid to said ram for moving said ram, electrical control circuits including a second normally open switch adapted to actuate said fluid supply means when closed and thereby supply fluid to said ram, a manually operable control device being shiftable between positions to actuate said first and second normally open switches, said control device being shiftable in one direction to close said first switch thereby to energize said power means and being shiftable in another direction to close said second switch thereby to actuate said fluid supply means, a third normally open switch in series with said second normally open switch and permitting the actuation of said fluid supply means only when closed, and a manual control for closing said third normally open switch to permit actuation of said fluid supply means when said second normally open switch is also closed.

22. In combination, a fiber baling press having a press box movable from a position in which it is being filled with fiber to another position in which the fiber is being packed, a vertically movable ram for packing fiber in said press box, power means to move the press box from one position to the other, electrical control circuits including a first normally open switch adapted to energize the power means when closed and thereby move the press box, means to supply fluid to said ram for moving said ram on its packing stroke vertically within the press box, additional electrical control circuits including a second normally open switch adapted to actuate said fluid supply means when closed and thereby supply fluid to said ram, a common manual control device for alternately opening and closing said first and second normally open switches, and a normally closed switch in series with said first normally open switch being opened upon the movement of said ram on its packing stroke thereby preventing the energizing of said power means and the movement of said press box when the ram is in the press box.

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UNITED STATES PATENT OFFICE
CERTIFICATION OF CORRECTION

Patent No. 2,882,816

April 21, 1959

Donald W. Van Doorn et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 42, strike out "contacts", second occurrence; column 8, line 66, for the claim reference numeral "16" read -- 1 --.

Signed and sealed this 23rd day of May 1961.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

DAVID L. LADD

Commissioner of Patents