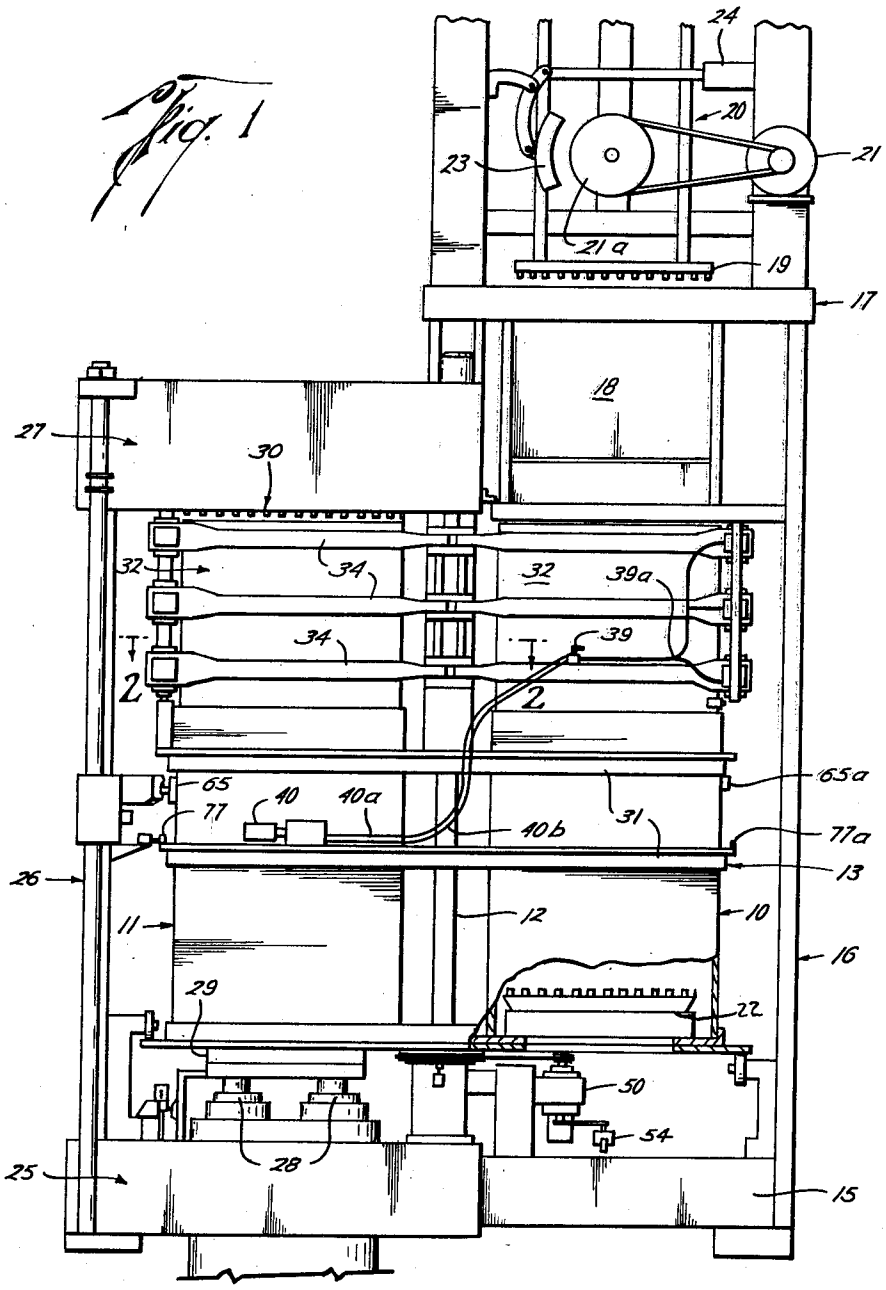
April 28, 1964 J. C. NEITZEL 3,130,665

PRESS BOX DOOR ASSEMBLY

Original Filed June 22, 1959 2 Sheets-Sheet 1

Fig. 1



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Fig. 2

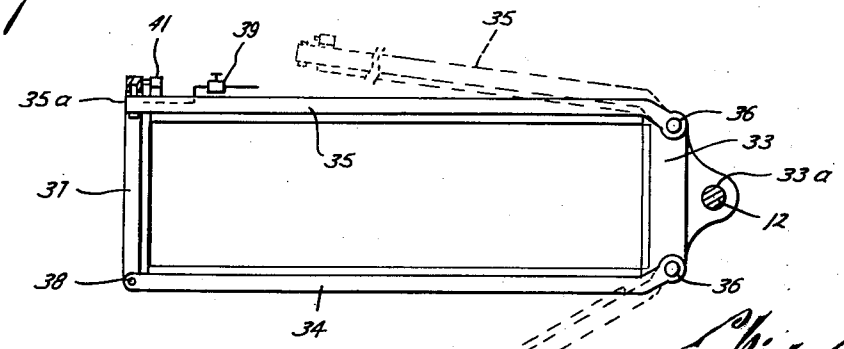


Fig. 4

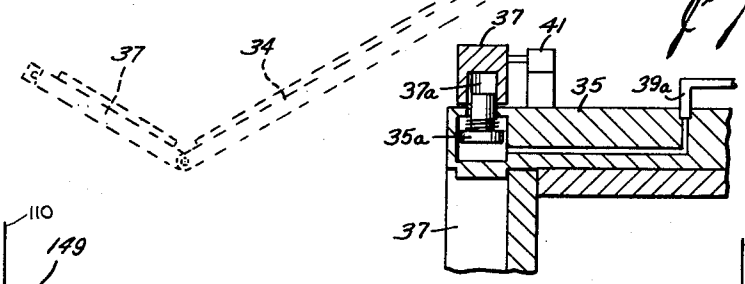
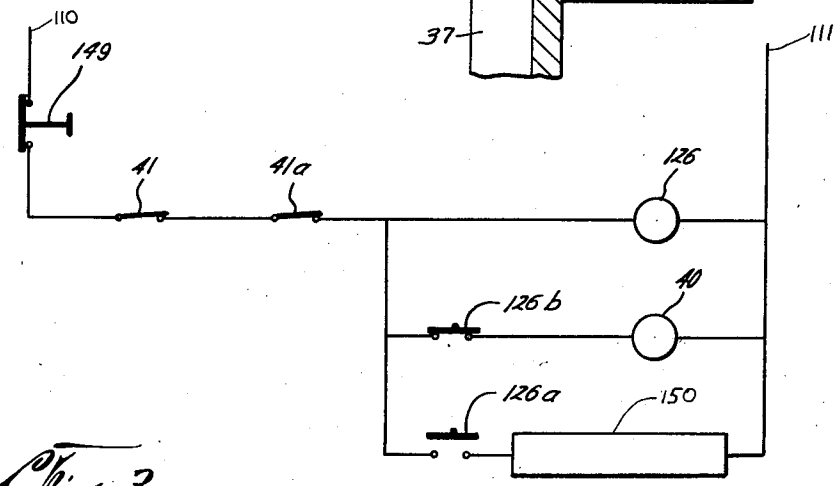


Fig. 3



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3,130,665
PRESS BOX DOOR ASSEMBLY

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Original application June 22, 1959, Ser. No. 821,755, now Patent No. 3,040,653, dated June 26, 1962. Divided and this application Feb. 5, 1962, Ser. No. 171,229
2 Claims. (Cl. 100—53)

My present invention relates to apparatus for the purpose of receiving fibers from cotton ginning and condensing equipment and pressing them into a bale. This application is a division of my application Serial No. 821,755, filed June 22, 1959, now Patent No. 3,040,653.

In the art of processing field-picked cotton, it is the practice to strip the fibers from the cotton seeds and form them into a continuous lint bat on the rotating drum of a condenser. In conventional installations, the bat moves down a slide at the exit of the condenser and is received within the press assembly, a unit which is adapted to compress the lint fibers into a bale. My invention is in the press, and particularly in those portions thereof identified as the press box doors.

A conventional press has compressing means such as one or more rams at its base, a sill spaced thereabove, and a pair of press boxes in side by side relationship which are rotatable about a vertical axis therebetween. One press box is in position between the ram and the sill, while the companion box is being filled with fiber arriving from the condenser. When a loosely packed box is rotated into position above the ram, final compression of its contents into a bale is accomplished by extension of the ram in an upward direction. Each press box has doors at its upper portion to permit the bale to be tied and removed from the unit.

Improvements in the equipment for ginning and condensing the fibers have lead to an increased speed of operation, so that the final steps in the processing of the lint, tramping, pressing and tying, have become the bottleneck in the operation. This has led to the development of my invention, one of the objects of which is to provide apparatus for increasing the speed of pressing and baling cotton to permit processing of the lint as rapidly as it becomes available from the condenser.

It is a further object of my invention to provide apparatus for automatically controlling and coordinating the operations of the press to eliminate delays in the sequence of operations which result from conventional, manual controls.

It is a further object of my invention to provide a press box door assembly in which a fluid pressure controlled piston which secures the press doors in a locked position is automatically actuated upon the closing of the doors so as to lock them into position.

It is a further object of my invention to provide a cotton press in which the automatic rotation of the press boxes through one-half revolution about the vertical axis theerbetween is prevented until such time as the press box doors are fully closed.

The foregoing and other objects of my invention which will become apparent are accomplished by means of a novel press box door assembly which has hydraulic door locking means and controls therefor, including position

responsive switches mounted on the door, and a pump to supply pressure fluid to the locking pistons in automatic response to the closing of the door.

Briefly, the operating cycle of my automatic press assembly begins with one press box above the ram. The other press box is being filled, and the ram is in its lowermost position. When the other press box has filled with sufficient lint to form a bale, as for example, 500 pounds, the control system disclosed in the above described application of which this application is a division will actuate automatic press box turning means to interchange the position of the press boxes by rotating them through one-half turn or 180° of arc. As soon as this step is completed, the press ram is actuated to begin compression of the contents of filled press box thereabove, such action also being initiated automatically. The hydraulic ram is automatically arrested when the lint has been compressed sufficiently to form a bale.

At this point, the press crew opens the press box doors, ties and removes the bale, prepares the empty press box with new bagging, and closes the press box door.

When the locking bar which secures the press box door in a closed position is rotated into position for proper engagement of the door locking piston, a position responsive switch is actuated thereby to immediately produce a controlled period of operation of the pump which supplies pressure fluid to the locking piston. The pump is deenergized at the conclusion of a period of operation sufficient in time to fully engage the locking piston in its recess.

The foregoing description will be more completely understood from the following detailed explanation, studied in conjunction with the attached drawings in which:

FIG. 1 is a partially cut away front elevation of my press assembly showing the hydraulic system which serves to secure the press doors in a locked position;

FIG. 2 is a section along line 2—2 of FIG. 1;

FIG. 3 is a schematic diagram of the portion of the electrical control system for my press which directs operation of the press box door assembly; and

FIG. 4 is a view in partial section of a portion of the press door locking assembly showing the manner and direction of movement of the locking pistons.

In FIG. 1, the press assembly comprises a pair of press boxes 10 and 11 on the right and left-hand sides of the central shaft 12. The press box frame 13 carries the press boxes and is rotatable about the shaft 12 to interchange the position of the boxes.

A conventional tramper indicated generally by reference numeral 20 is located above the right-hand side of the press illustrated in FIG. 1. The press base 15, shaft 12, upright 16 and sill 17 define a rigid support, and as cotton is introduced into the space 18 below the sill 17, the vertically reciprocating tramper foot 19 moves downward to drive it into the press box therebelow. The final compression of the fiber into a bale is effected at the left-hand side of the press where the press base sill 25, upright 26, shaft 12 and the top sill 27 define the rigid support necessary to react the compressive baling load. The upwardly traveling rams 28, one or more in number, are mounted on the press sill 25 and topped by the cap 29 which is adapted to contact the follow block 22 at the bottom of the press box and force it upwardly there-

through. Secured below the top sill 27 is the top platen 30 against which the contents of the press box are compressed as a result of the movement of the follow block.

It is apparent that the press boxes 10 and 11 are identical and that the operations at the right and left hand sides of the press assembly as above described occur generally simultaneously in time and are performed alternately with respect to each box. The boxes are braced at the lower portion by members 31 which form a part of the press box frame 13, and have movable door sections indicated generally by reference numeral 32 at their upper portion.

The section of the press box 11 shown in FIG. 2 is typically illustrative of both boxes, and the partial section of FIG. 4 is typically illustrative of each of the locking pistons. The inner wall or center support structure 33 has an opening 33*a* for accommodation of the central shaft 12. The two doors 34 and 35 are each connected to wall 33 by pins 36 which allow relative rotary movement therebetween. A door locking bar 37 is mounted by pin 38 to the free end of door 34 and includes recesses 37*a* at its opposite end which receive the hydraulically actuated locking pistons 35*a* on the free end of door 35. Thus, when both doors are closed, the locking bar extends along the fourth side of the rectangle, partially defined by wall 33 and doors 34 and 35, and the pistons 35*a* lock the doors in such position. The broken lines in FIG. 2 show the manner in which the doors open.

The operating pressure for locking the press doors is produced by door pump 40, as shown in FIG. 1. From the pump, the pressure line 40*a* and a relief line 40*b* extend to the door pump valve 39, there being one valve on each door. Line 39*a* interconnects the valve 39 and the locking pistons 35*a*, three in number in the disclosed arrangement, and the valve is manually operable to pressurize or relieve the cylinders by connecting line 39*a* to line 40*a* or 40*b*.

It is apparent that lines 40*a* and 40*b* are connected to the valve 39 on press box 11 as shown in FIG. 2, although in FIG. 1, the reverse side of box 11 cannot be seen. It also is apparent that the valve 39 need not be at the point of intersection of lines 40*a*, 40*b* and 39*a*, as it need only close and open line 40*b* to alternatively allow pressurization of the cylinders and relieve the system to the reservoir of pump 40. Thus a direct connection between lines 40*a*, 40*b* and 39*a* and an openable valve at any convenient point in line 40*b* would suffice for purposes of my invention.

At the free end of door 35 is the limit switch 41 which is so positioned that when the doors are closed and the locking bar 37 is in position, the switch is closed. At all other times, the switch is open. Switch 41 has a counterpart 41*a* on the door of the companion box 10. The effect of the position of switch 41 as well as that of the elements controlled thereby shall be subsequently described herein.

FIG. 3 represents that portion of the control assembly of my press which is pertinent to the operation of the press box door locking assembly. Across parallel mains 110 and 111 there is sufficient electrical potential to operate the various components as selected by one skilled in the art. The emergency stop button 149 is provided to de-energize and stop the entire system when it is opened. In FIG. 3 this switch is closed. Switches 41 and 41*a* are connected in series with each other and with the coil of relay 126. In parallel with relay 126 is the normally closed contact 126*b* and the normally open contact 126*a*, both of which are controlled thereby. In series connection with contact 126*b* is the pump motor 40, and in series connection with contact 126*a* are those elements of the control assembly which automatically actuate the press box turning means when the press box below the tramper is filled. These elements, indicated generally here by reference numeral 150, are fully disclosed in my co-pending application identified herein of which the present application is a division, and it is necessary only to point

out that operation thereof is prevented while contact 126*a* is open. Although several elements are identified generally by reference numeral 150, their functions and methods of operation are fully explained in the said co-pending application, and such details form no part of the present invention. However, it may be noted with regard to FIG. 1 that reference numerals 21, 21*a*, 23 and 24 identify various portions of the tramper assembly, reference numerals 65, 65*a*, 77 and 77*a* identify lugs or switch operating members which cooperate with certain limit switches to control automatic cycling of the entire press unit, and reference numerals 50 and 54 identify respectively the turning motor which rotates the press boxes about the shaft 12, and the plugging switch which retards rotation thereof when actuated.

Assuming that the contents of the press box immediately above the rams have been compressed into a bale and that the bale has been tied and removed, the press crew closes the press doors 34 and 35, and the door locking frame 37 is moved into proper position to receive the locking piston 35*a*. The manual valve 39 is in position to pressurize the locking cylinders when the pump 40 is operating. The door position limit switch 41 or 41*a* will have closed, and as its counterpart on the opposite door already will be closed, the coil of relay 126 will be energized. The first relay contact 126*a* which is normally open will close so that the press may be directed in the performance of subsequent automatic operations as dictated by portions of the control system not shown. The second relay contact 126*b* is in series with the door pump 40, and normally is closed. However, an inherent time delay in the opening of contact 126*b* after energization of the relay coil provides a period of operation of the pump 40 which is sufficient to move the door locking pistons 35*a* into their recesses. Thereafter, the pump is de-energized by the opening of contact 126*b* upon completion of its time delay. When the press box under the tramper has been rotated into position above the rams and its contents pressed into a bale, the opening of the door will open the switch 41 or 41*a* mounted thereon to de-energize relay 126, thus opening contact 126*a* and closing contact 126*b*.

In order to release the door locking piston to tie and remove a bale from the filled box, the manually controlled valve 39 may be placed in a position to relieve the pressure therein through line 40*b*. Thus, my press lock assembly is automatic in locking after the locking frame is moved into position, but is manually opened by proper positioning of the valve 39.

The press door assembly and control system therefor which I have disclosed herein is the presently preferred arrangement, but it is apparent that one skilled in the art might suggest certain changes which would fall within the scope of my invention. Thus it is desired to protect by Letters Patent all such changes and modifications as fall within the scope of the following claims.

I claim:

1. In a press having a press box with an openable door held in a closed and locked position by a locking bar engaged by a fluid pressure operated piston, and a pump connected to said piston and operative while energized to supply pressure fluid thereto; the combination comprising a position responsive switch on said door, said switch being closed when said locking bar is closed into position for engagement by said piston, electrical relay means in series connection with said switch, a normally closed contact in series connection with said switch and said pump, said contact being actuated by said relay means and being delayed in opening for a timed interval following actuation thereof whereby said pump is energized for said timed interval upon said closing of said locking bar.

2. In a press having a pair of press boxes in side by side relationship adapted for rotation about a vertical axis therebetween, each of said press boxes having an openable door held in a closed and locked position by a locking

bar engaged by a fluid pressure operated piston, electrically actuated pres box turning means adapted when actuated to rotate said boxes through one-half turn about said axis, and a pump connected to said pistons and operative while energized to supply pressure fluid thereto; the combination comprising a position responsive switch on each said door, said switches being closed when said locking bars are closed into position for engagement by said piston, electrical relay means in series connection with said switches, a normally closed contact in series connection with said switches and said pump and in parallel connection with said relay means, said normally closed contact being delayed in opening for a timed interval following

actuation thereof, and a normally open contact in series connection with said turning means and in parallel connection with said relay means, said normally closed and said normally open contacts being actuated by the energization of said relay means whereby said pump is energized by said closing of said locking bars, and actuation of said turning means is prevented while said doors are open.

References Cited in the file of this patent

UNITED STATES PATENTS

2,241,063	Grimes et al.	May 6, 1941
2,503,354	Quinn	Apr. 11, 1950
2,963,959	Van Doorn et al.	Dec. 13, 1960