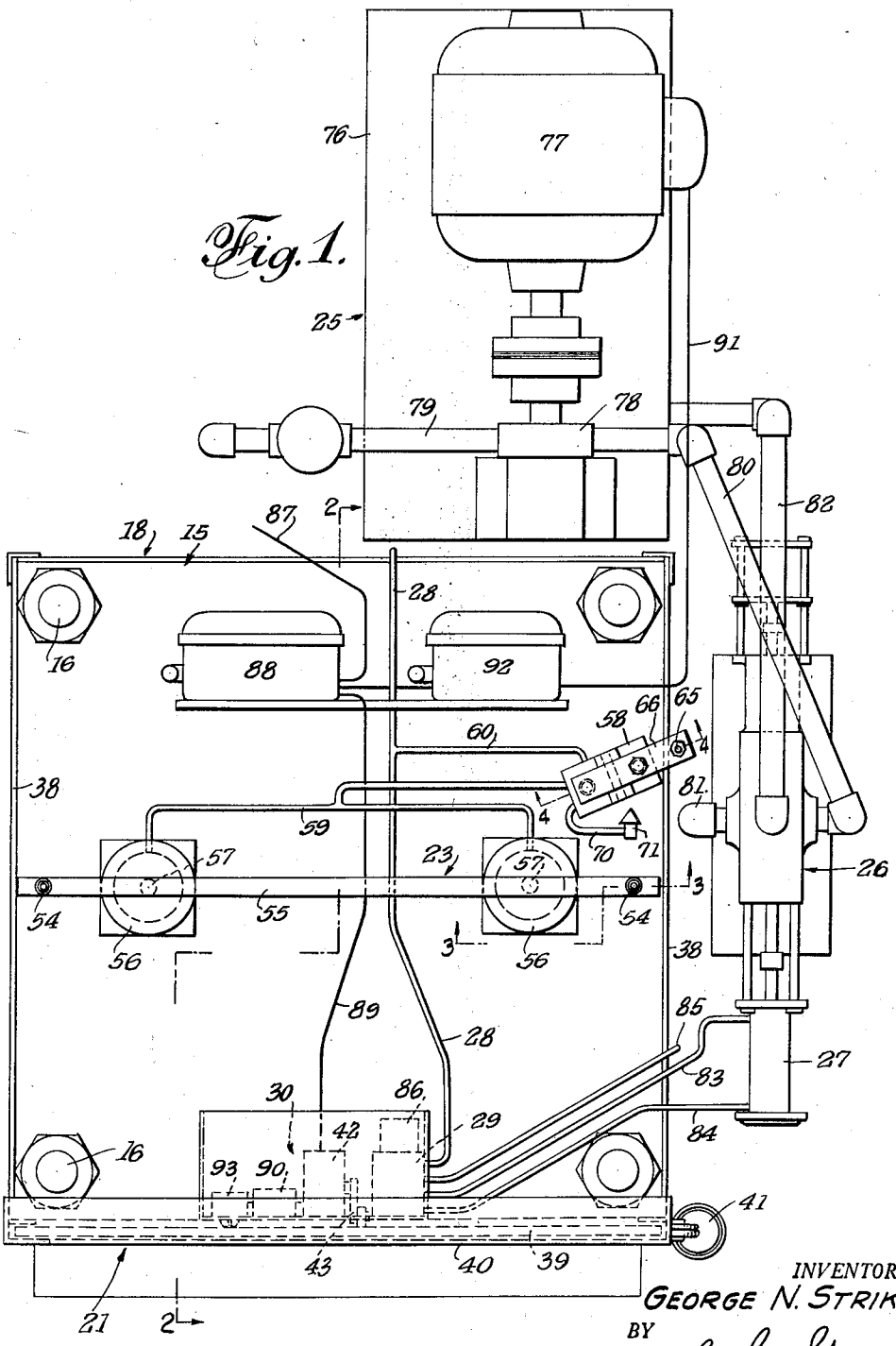
April 17, 1951 G. N. STRIKE 2,549,344

MOISTURE-EXTRACTING HYDRAULIC PRESS

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Fig. 1.



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Fig. 2.

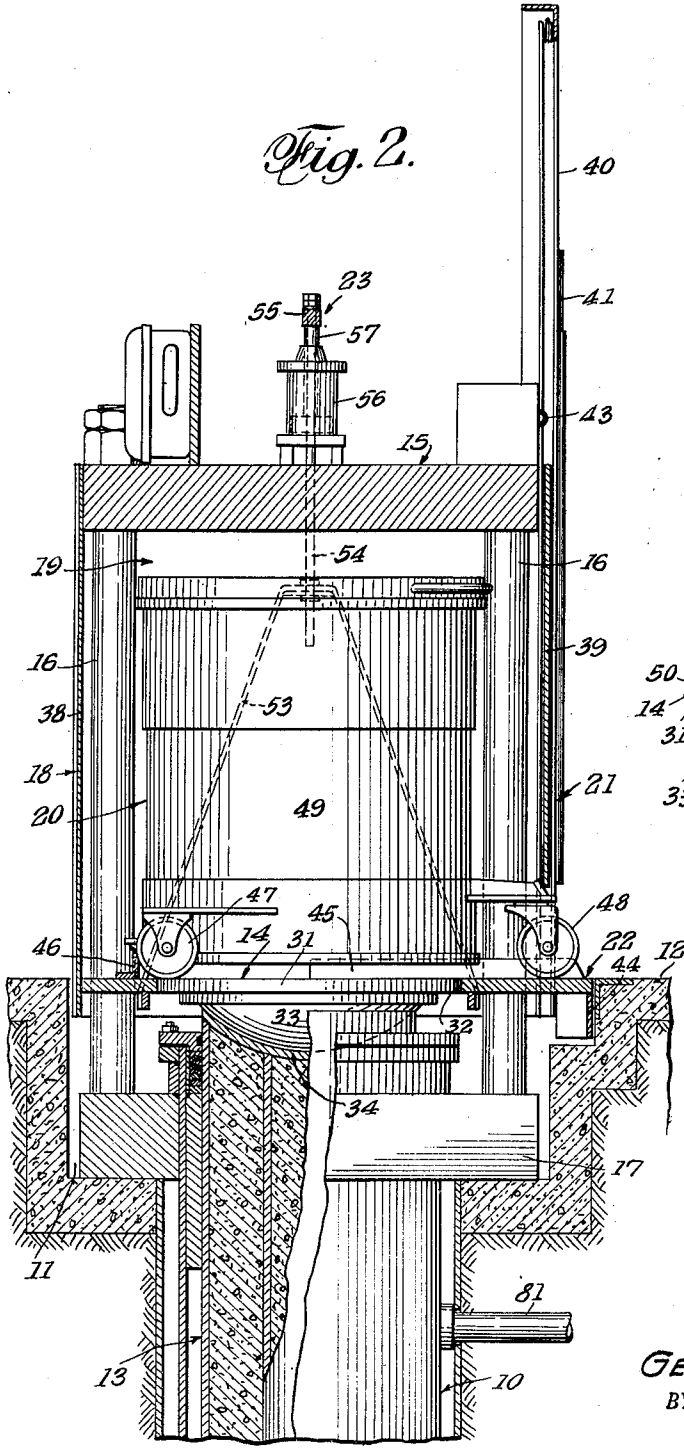
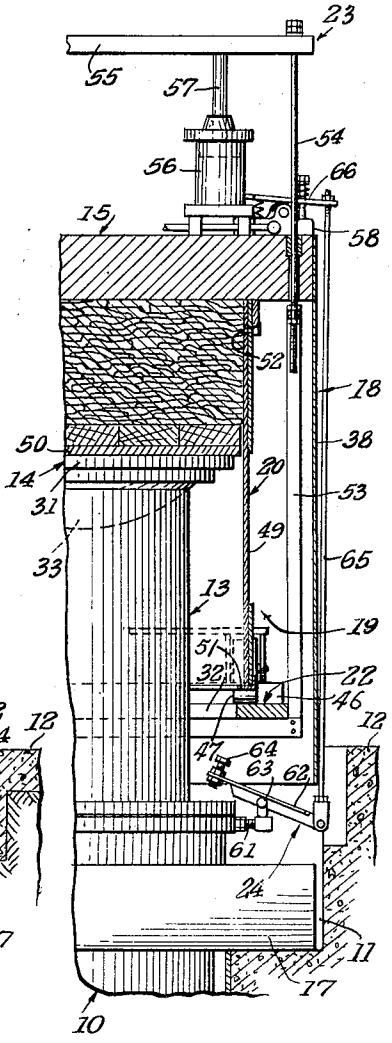


Fig. 3.



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Fig. 4.

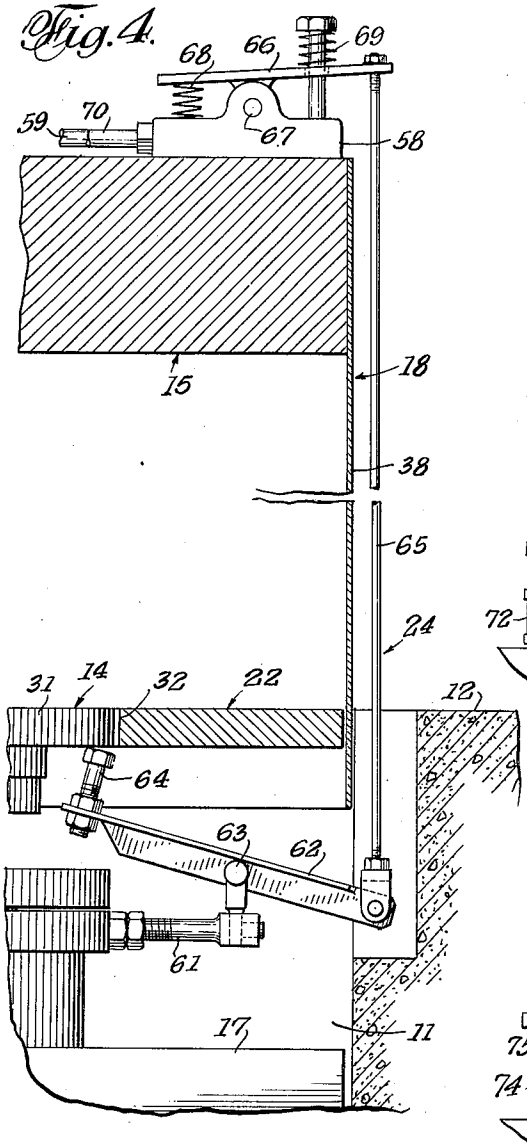


Fig. 5.

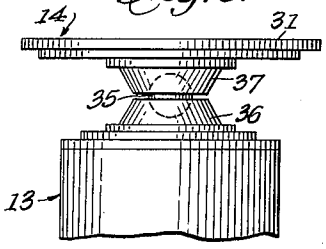


Fig. 6.

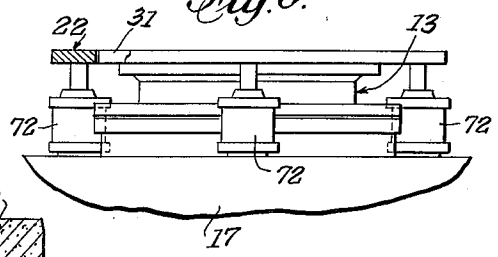
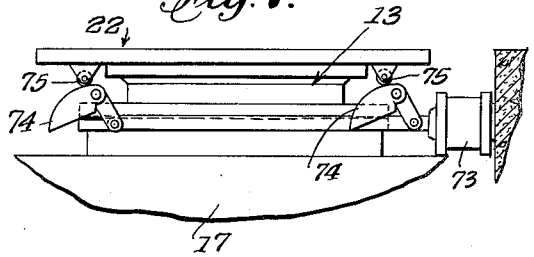


Fig. 7.



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Patented Apr. 17, 1951 2,549,344

UNITED STATES PATENT OFFICE

2,549,344

MOISTURE-EXTRACTING HYDRAULIC PRESS

George N. Strike, Los Angeles, Calif.

Application October 18, 1948, Serial No. 55,159

11 Claims. (Cl. 68—241)

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This invention relates to a hydraulic press for extracting moisture from laundry wash and is an improvement of the apparatus shown in my pending application, Serial No. 21,018, filed April 14, 1948.

The mentioned pending application discloses a hydraulically operated cylinder and ram, a press head or platen thereabove, and a novel form of wash-containing truck that is positioned between the ram and platen for compression of the wash therebetween, the moisture in the wash being thereby extracted.

An object of the present invention is to provide similar means embodying improved truck-lifting means for initially engaging the open top of the truck and the platen before compression of the wash occurs to thereby obviate some of the items of wash being pinched between the truck rim and the platen and possibly injured.

Another object of the invention is to provide pneumatic means for effecting the above lift of the truck, said means thereby embodying elasticity that resiliently holds the truck in engagement with the platen while compression of the wash progresses and which yields to the weight of the truck so that the same automatically drops upon retraction of the wash-compressing ram.

A further object of the invention is to provide in a press of the character indicated, novel pneumatic control means for the ram of the press and for the movement of the wash-containing truck that, once instituted, the cycle of operation is automatically carried out.

The invention also has for its objects to provide such means that are positive in operations, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes embodiments of the present invention, which are given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a top plan view of a moisture-extracting hydraulic press embodying features of the present invention.

Fig. 2 is a vertical sectional view as taken on the line 2—2 of Fig. 1, and drawn to a reduced scale.

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Fig. 3 is a similar view as taken on line 3—3 of Fig. 1, the press being shown in the process of extracting moisture from the wash.

Fig. 4 is an enlarged broken vertical sectional view as taken on line 4—4 of Fig. 1.

Figs. 5, 6 and 7 are fragmentary views of modified construction details.

The present machine comprises, generally, a hydraulic cylinder 10 that is mounted within a pit 11 to be below a floor 12; a ram 13 in said cylinder fitted with a wash-compressing head 14 and adapted to be projected in an upward direction; a press head 15 spaced above the floor 12 and supported by posts 16 from a base 17 disposed in the pit, said base also supporting cylinder 10; and a fixed enclosure 18 for three sides of the space 19 between the floor and the press head, leaving the front thereof open for movement therethrough of a wash-laden truck 20; a closure 21 for said open front; a platform 22 normally level with the floor for supporting the truck; pneumatically-controlled means 23 for lifting the platform and the truck thereon to move the latter into engagement with press head 15; means 24 controlled by the ram for controlling the means 23; a hydraulic-fluid supply unit 25 and a valve 26 for controlling flow of fluid to cylinder 10, said valve embodying a pneumatic control 27; an air line 28 for operating the means 23; a valve 29 connected in said air line for controlling operation of control means 27; and time-controlled electrical means 30 for controlling operation of unit 25, valve 26 and, thereby, the movement of the ram, the ram, through means 24, controlling operation of the pneumatically-controlled means 23.

The ram head 14 comprises a plate 31 normally residing in an opening 32 in platform 22 and flush with said platform so that a truck 20 may be readily wheeled onto the latter without obstruction. Said head 14 comprises a spherical part 33 that fits a spherical seat 34 in the upper end of the ram where said head may automatically adjust itself while compressing wash in the truck. As shown in Fig. 5, instead of the part 33 and seat 34, a single ball 35, of suitable size, may be set in opposed cups 36 and 37 on the ram and head, respectively, to provide the latter with suitable limited adjustability.

The enclosure 18 may comprise suitable sheeting 38 that extends from the press head 15 part way into the pit to effectively include the water

that is pressed out of the wash and prevent the same from unduly wetting the floor around the press. Suitable channels extending from the pit may be provided for drawing off this water.

The closure 21 comprises a sliding panel 39 that is guided in a frame 40 and is balanced by a counter weight 41, said panel, when the press is not in operation, being adapted to be raised in frame 40 to afford passage for truck 20 into and out of space 19, and, when the press is in operation, said panel is adapted to be lowered, as in Fig. 2, to enclose the otherwise open front of the press. Panel 39 may also serve to control a limit switch 42, part of means 30, so that only when the panel is down, is said switch closed, any raising of the panel opening the switch and thereby arresting operation of the press. Switch 42 may be any one of several types of switches available on the market and, accordingly, is not shown in detail except to indicate an arm 43 that has operative engagement with the panel 39.

The platform 22, at the front thereof, is provided with an apron 44 that closes the gap created between the platform and floor when the former is lifted. Side guides 45 are also provided on the platform as means to center the truck thereon laterally, and, at the rear of the platform is provided a stop 46 for the truck to center the latter in the other dimension of the press.

The truck 20 is mounted on a pair of front wheels 47 and a rear caster wheel 48, the wheels being so spaced as to rest on the platform, leaving plate 31 clear for movement up into the interior of the tubular truck body 49. As shown in Fig. 3, the bottom of the truck comprises a loose plate 50 that normally rests on a ledge 51 and is adapted to be engaged and lifted by plate 31 and thereby telescopically moved up into the body 49.

In practice, moisture-laden wash is placed in the truck to substantially fill the same and when said wash is compressed against the press head 15, by the ram, part of the moisture will be pressed out between plate 50 and the truck body 49 and part through a series of holes 52 formed in said body adjacent its upper rim. In actual operation, five minutes of pressure of the ram causes extraction of somewhat more than fifty per cent of the water in the wash. Centrifugal moisture extractors now in common use, require between fifteen and twenty minutes of centrifuging to obtain comparable results.

The means 23 comprises a hanger strap 53 connected to each side of platform 22, an adjustable tension rod 54 connected to each strap and extending upwardly through suitable openings in press head 15, a cross beam 55 connecting rods 54, a pair of air cylinder units 56 mounted on the press head and having the piston rods 57 connected to the cross beam, a valve 58, an air line 59 connecting said air units and said valve, and an air line 60 extending from air inlet line 28 to said valve.

The cross beam 55 is arranged above units 56 so that air from line 28 may flow in line 60, through valve 58, in line 59, and into the bottoms of units 56 to raise said beam, rods 54, hanger straps 53, platform 22 and truck 20 to bring the top rim of the latter into contact with the under face of the press head, as in Fig. 3. The air press will maintain this condition so long as valve 58 is positioned to communicate lines 60 and 59.

Normally, however, valve 58 is positioned to close off line 60 and is actuated by means 24 to institute raising of the truck as above described. Said means comprises an adjustable bracket 61 mounted on cylinder 10 or any fixed part of the press, a rock arm 62 connected to said bracket as by a pivot 63, an adjustable stud 64 on one end of said rock arm and in a position to be engaged by the under face of plate 31, a rod 65 extending upward from the other end of said rock arm, a plate 66 engaged with the upper end of rod 65 and mounted to rock on a pivot 67 provided on valve 58, and light springs 68 and 69 and both urging said plate in a direction to urge stud 64 against plate 31.

Valve 58 is of conventional form, being either a four-way valve with one port plugged or a three-way valve with a port for line 59, a port for line 60, and a port for an exhaust line 70. In this instance, an air whistle 71 is provided on the end of line 70. The valve is of the type that effects connection of lines 59 and 60 in one position thereof and connection of lines 59 and 70 in the other position. So long as plate 31 is flush with platform 22, as in Fig. 2, valve 58 is held in position to exhaust cylinder units 56 through lines 59 and 70. However, upon initial upward movement of the ram, plate 31, as it moves up to achieve contact with truck bottom 50, will release stud 64. Now, the weight of rod 65 and springs 68 and 69 will cause plate 66 to rock on pivot 67 and move valve 58 to effect connection of lines 59 and 60. Air will then flow into units 56 and, thereby lift the truck to bring its top rim against the press head.

When the moisture-extracting period is ended, and the ram starts to move down, the pressure on the wash is released and the same no longer exerts a lateral force against the inner face of the truck body 49. Since the air in cylinder units 56 is elastic, the weight of the truck, the platform, and the members connecting the latter to piston rods 57, will become effective to compress the air in said units, resulting in a partial lowering of the platform and truck before the ram has moved downward to any material degree. Thus, an inch or two of the wash remains projected above the top of the truck enabling easier removal thereof after the truck is removed from the press. The ram continues to move down and plate 31 re-encounters stud 64, rocking arm 62 and effecting movement of valve 58 to exhaust the air in units 56. It is then that whistle 71 sounds to apprize the attendant that the cycle of operation is completed. As units 56 are exhausted, platform 22, of course, drops to its initial flush position with the floor so that the truck can be readily wheeled out and replaced by another wash-laden truck.

It will be evident that the movement of platform 22 may be effected from beneath instead of from above. As shown in Fig. 6, three or more air cylinder units 72 may be mounted on base 17 to directly engage and lift said platform under control of a valve comparable to valve 58. As shown in Fig. 7, a single cylinder unit 73 through the medium of suitable cams 74 engaged with rollers 75 on the under face of the platform may be arranged to raise the latter in a manner similar to those above indicated.

The unit 25 comprises a hydraulic fluid storage tank 76, an electric motor 77 mounted thereon, and a fluid pump 78 driven by said motor for drawing fluid from said tank through a line 79 and forcing the same into a line 80 connected to valve 26.

Said valve 26 controls flow to a line 81 that sup-

plies fluid to cylinder 10 for raising ram 13. Valve 26 is of conventional form and has an additional connection 32 directly back to tank 76. The valve is air-operated, from line 28, by air cylinder 27 as controlled by solenoid-operated four-way valve 29, flow connections 83 and 84 and exhaust line 85. With valve 29 in its normal inactuated position, air from line 28 passes into line 83 to set valve 26 so that cylinder 10 is exhausted through lines 81 and 82 into tank 76. When solenoid 86 of valve 29 is energized, line 28 is connected to line 84 to set valve 26 to pass fluid, under pressure of pump 78, through lines 80 and 81, into cylinder 10. This energization of solenoid 86 occurs simultaneously with starting of operation of motor 77. As valve 29 changes from one position to the other, line 85 exhausts the non-pressure end of air cylinder 27.

The time-controlled means 30 comprises a source of electric current supplied by a two-wire conduit 87 which, through a switch box 88, connects to a conduit 89. The latter, in turn, connects to a push-button switch 90 and the mentioned limit switch 42. A conduit 91 having a switch box 92 connected therein, connects to motor 77. A timer 93, of conventional design, controls switch 90 which has a manual "make" and a timer "break." The switches in boxes 88 and 92 are normally closed and remain closed under all normal operating conditions.

In operation, after a wash-laden truck is placed in the press, panel 39 is moved down, causing limit switch 42 to close. The timer 93 is then manually set to time the cycle of operation. Push-button switch 90 is then pressed to close the circuit to motor 77 and, thereby, starts pump 78 and also to solenoid 86 to set valve 29 and, through the latter, valve 26 to direct pumped fluid into cylinder 10. As above described, the ram 13 will start up to institute the cycle of operation. The pump continues to operate, and bypasses such fluid as will not be further accepted by the cylinder 10. The pressure on the wash continues until timer 93 runs down and opens switch 90 simultaneously cutting current to motor 77 and to solenoid 86. Valve 26 will then shift to exhaust cylinder 10 and institute lowering of the ram by force of gravity. As hereinbefore set forth, the press parts will return to their initial positions and the warning of whistle 71 is sounded. The attendant then raises panel 39 to, thereby, open the limit switch and prevent accidental operation of the press, to gain access to the truck and to replace the same with another wash-laden truck. The cycle of operation may be again started as above.

While the invention that has been illustrated and described is now regarded as the preferred embodiments, the construction is, of course, subject to modifications without departing from the spirit and scope of the invention. It is therefore not desired to restrict the invention to the particular forms of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A press of the character described comprising a hydraulic ram, a platform surrounding the operating end of the ram and normally flush therewith, a wash-laden truck movable onto said platform to a position aligned with said ram, said truck having a movable bottom engaged by the ram for displacing the wash in the truck in an upward direction, a press head against which said wash is compressed to rid the same of contained moisture, and means inter-engaging the ram and the platform and controlled by the ram for elevating said platform to thereby lift the truck thereon into engagement with said press head before the wash is compressed.

2. A press of the character described comprising a hydraulic ram, a platform surrounding the operating end of the ram and normally flush therewith, a wash-laden truck movable onto said platform to a position aligned with said ram, said truck having a movable bottom engaged by the ram for displacing the wash in the truck in an upward direction, a press head against which said wash is compressed to rid the same of contained moisture and pneumatic means inter-engaging the ram and the platform and controlled by and operable upon initial movement of the ram for elevating said platform to thereby lift the truck thereon into engagement with the press head.

3. A press of the character described comprising a hydraulic ram, a platform surrounding the operating end of the ram and normally flush therewith, a wash-laden truck movable onto said platform to a position aligned with said ram, said truck having a movable bottom engaged by the ram for displacing the wash in the truck in an upward direction, a press head against which said wash is compressed to rid the same of contained moisture, pneumatic means including a cylinder and piston interengaging the ram and the platform and controlled by and operable upon initial movement of the ram for elevating said platform to thereby lift the truck thereon into engagement with the press head, and presettable time-controlled means for the wash-compressing movement of said ram, said ram being movable downwardly by gravity upon termination of control by the latter means, and said ram, at the end of said downward movement, releasing the penumatic means, whereby the platform gravitationally resumes its initial position flush with the operating end of the ram, said truck lowering with the platform.

4. In a moisture-extracting press of the character described and having a hydraulic ram, a truck-receiving platform normally flush with the operating end of the ram, and means inter-engaging the ram and the platform and controlled by said ram, upon initial movement thereof in one direction, to elevate the platform and the truck thereon and also controlled by the ram, upon final movement thereof in the other direction, to release the platform to fall by gravity to its initial position.

5. In a moisture-extracting press of the character described and having a hydraulic ram, a truck-receiving platform normally flush with the operating end of the ram, pneumatic cylinder means having pistons, a mechanical connection between the pistons and the platform, an air line and a valve in said line connected to said cylinder means to move the pistons thereof in a direction to lift said platform, and means controlled by said ram and connected to operate the mentioned valve.

6. In a moisture-extracting press of the character described and having a hydraulic ram, a truck-receiving platform normally flush with the operating end of the ram, pneumatic cylinder means having pistons, a mechanical connection between the pistons and the platform, an air line and a valve in said line connected to said cylin-

der means to move the piston thereof in a direction to lift said platform, and means controlled by said ram and connected to operate the mentioned valve, said latter means comprising a rock arm having releasable engagement with the ram and released upon initial moisture-extracting movement of said ram, and a mechanical connection between said rock arm and valve.

7. In a press of the character described and having a projectable ram, a pres head in spaced relation thereto affording a space for a wash-laden truck, a platform for receiving said truck with the top of the latter spaced from the press head, means for moving the ram in a direction toward the press head, and means engaged with the ram and released upon initial movement thereof to move said platform in a direction toward the press head and thereby engage the top of the truck thereon with said press head.

8. In a press of the character described and having a projectable ram, a press head in spaced relation thereto affording a space for a wash-laden truck, a platform for receiving said truck with the top of the latter spaced from the press head, means for suspending the platform from the press head, means for moving the ram in a direction toward the press head, and means, including a portion of the platform-suspending means, engaged with the ram and released upon initial movement thereof to move said platform in a direction toward the press head and thereby engage the top of the truck thereon with said press head.

9. In a press of the character described and having a projectable ram, a press head in spaced relation thereto affording a space for a wash-laden truck, a platform for receiving said truck with the top of the latter spaced from the press head, means for suspending the platform from the press head, said means comprising laterally spaced hanger straps, a cross beam connecting said straps, and pneumatic means on the press head and engaged with the cross beam for moving the latter relative to the press head, means for moving the ram in a direction toward the press head, and means, including a portion of the platform-suspending means, engaged with the ram and released upon initial movement thereof to move said platform in a direction toward the press head and thereby engage the top of the truck thereon with said press head.

10. In a press of the character described, a

platform for receiving a truck having a movable bottom, said platform having an opening therein, a ram projectable from a substantially flush position with the platform through said opening to engage the movable bottom of the truck and move the same upwardly therein, a press head spaced above the truck and against which material in the truck is pressed by the truck bottom, a fluid flow controlling member, an actuator for the latter member having engagement with the ram and held thereby to close said member to fluid flow, means responsive to release of the actuator upon projecting movement of the ram to open said member to fluid flow, and a lift for the platform including cylinder and piston means connected to and controlled by the flow controlling member, whereby the piston means of the lift is moved in a direction to raise the platform to, thereby, press the top of the truck against the press head.

11. In a press of the character described, a platform having an opening therein, a movable ram residing in said opening when retracted, a lift for the platform, and operating means for raising the lift including a member engaged by the ram when the latter is retracted and released when the ram is projected, said operating means including a resilient element for moving the member so released, penumatic cylinder-piston means connected to the lift, and an air-flow controlling valve connected to the latter means and opened by the resilient element to operate said cylinder-piston means, whereby projection of the ram results in movement of the platform in the same direction.

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