June 26, 1962 G. A. BILOCQ 3,040,861

LOG FEEDING MECHANISM

Filed April 17, 1961 3 Sheets-Sheet 1

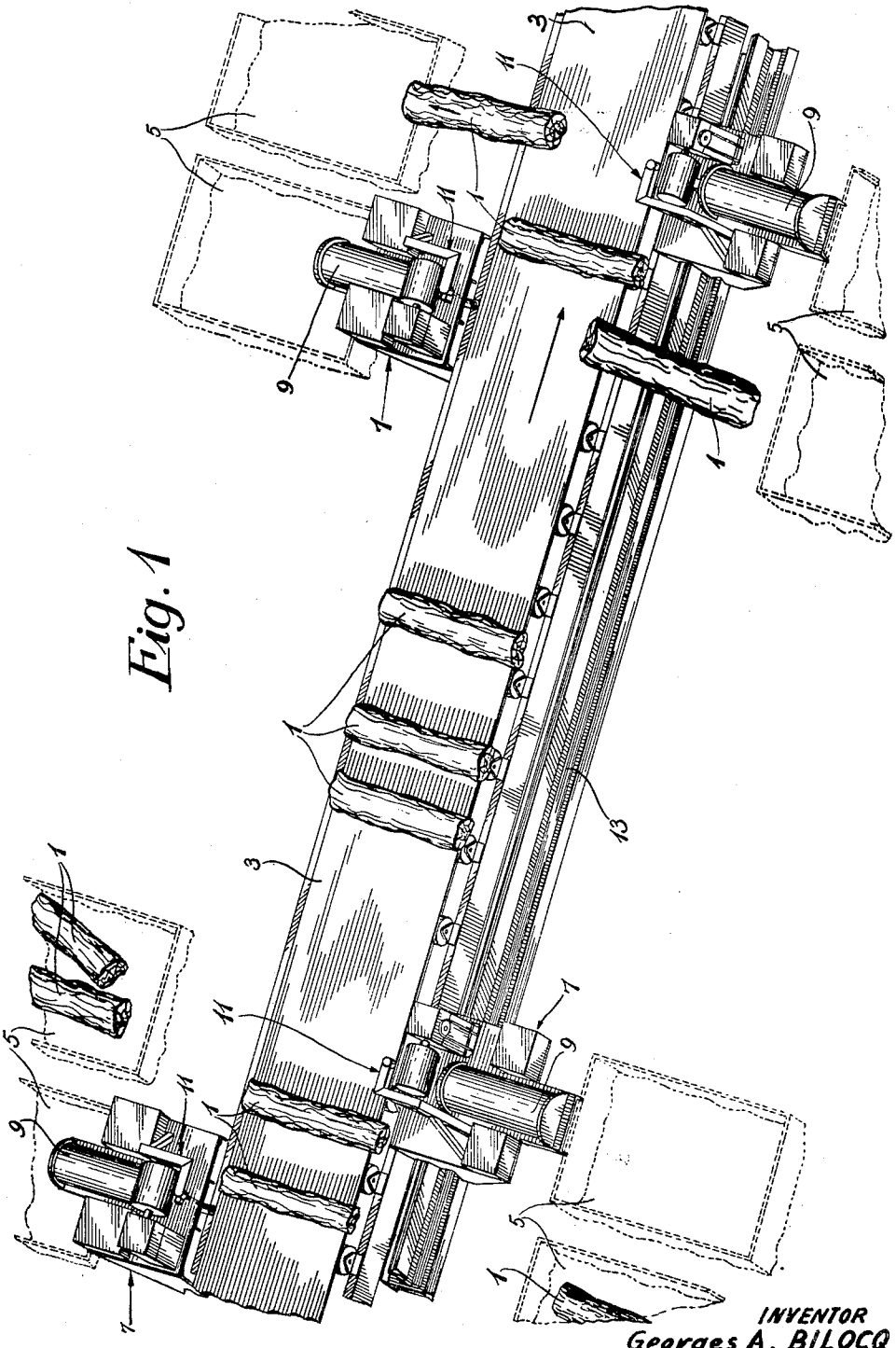


Fig. 1

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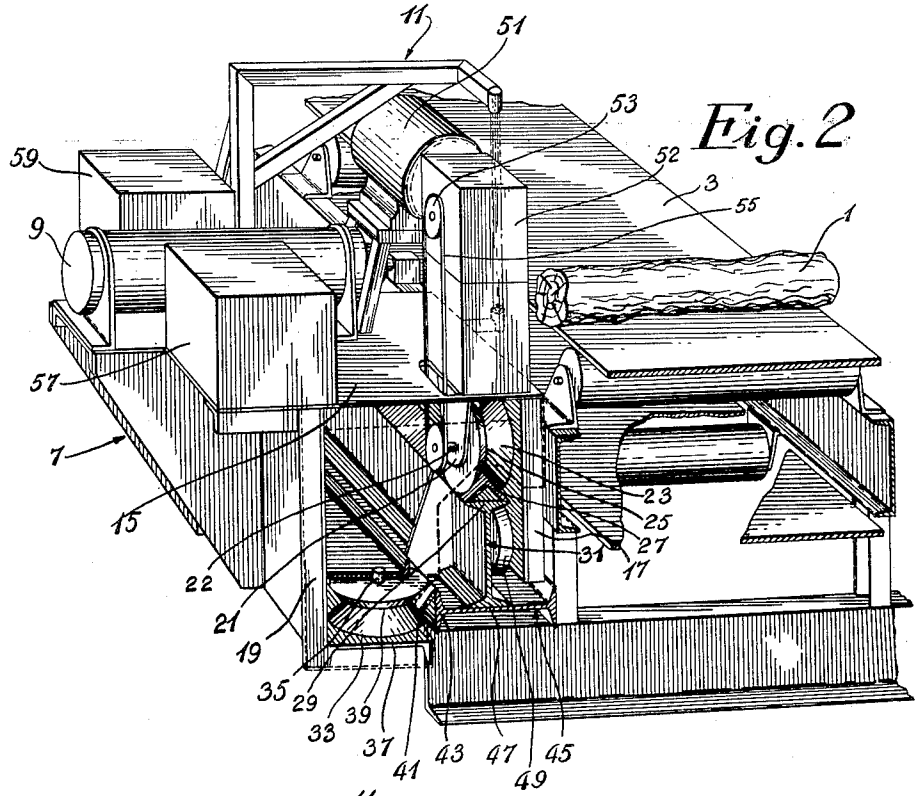


Fig. 2

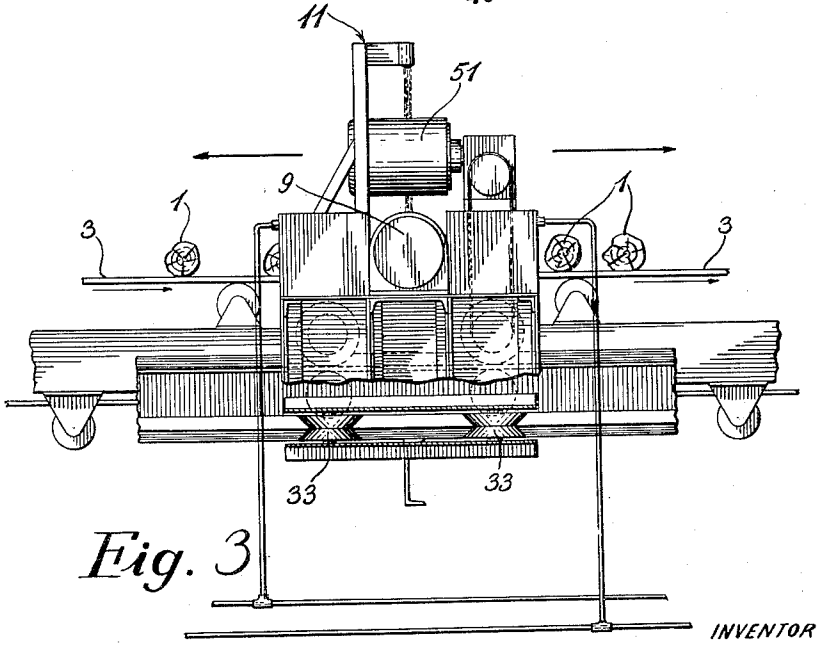


Fig. 3

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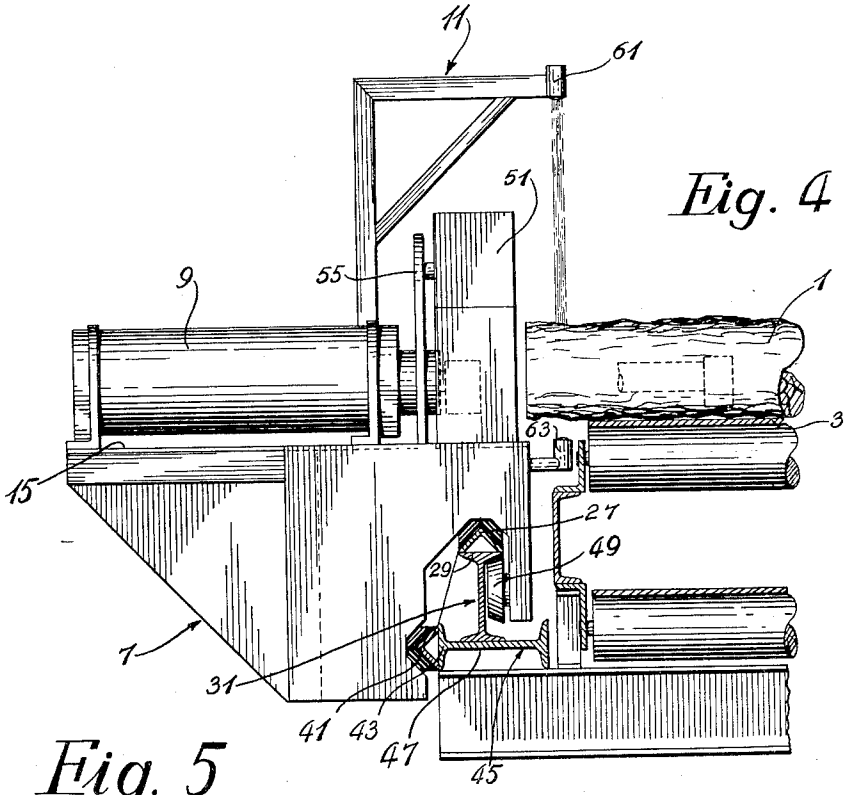
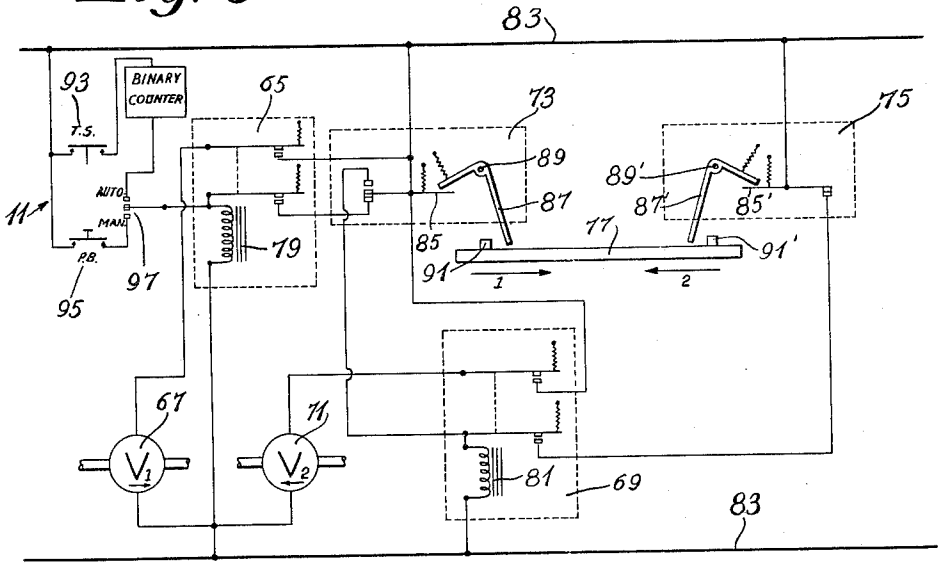


Fig. 4

Fig. 5



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LOG FEEDING MECHANISM

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4 Claims. (Cl. 198—21)

This invention relates to an automatic mechanism for moving objects from a conveyor into containers standing by the side of the conveyor.

Devices of the aforesaid type are not believed to exist, at least not in the logging and pulp and paper industries. At present such a process is carried out by stationing operators along the conveyor to push pulp logs into the containers. Obviously, such a manual process is costly, and time-consuming to say the least.

It is an object of the invention, therefore, to provide a mechanism, or machine, adapted to carry out, automatically, the motions calculated to displace logs and the like from a moving conveyor into containers disposed at the side of the conveyor, thereby replacing in a more rapid, efficient and economic manner similar operations heretofore performed by manual labor.

The invention is carried out by means of a machine or mechanism having a reciprocating piston and sensing means to detect passing logs. When such a log passes within the range of the sensing means, the latter causes energization of the actuating piston which moves out to push the log across the conveyor into a container standing across on the other side of the conveyor. The piston then retracts into the cylinder until the passage of the next log. The in and out movements of the piston are obtained by means of a first and second piston-actuating means which cause the piston to move alternatively in and out of its cylinder. A selector switch bridges the two actuating means and switches power alternatively from the first means to the second while a limit switch cuts the power off the second means after a complete cycle, that is: after one in-and-out movement of the piston. An end-of-course mechanism, which moves in unison with the piston, is responsible for actuating the selector switch for the transfer of power when the piston has reached the out position, and for actuating the limit switch at the end of the cycle which cuts the second piston-actuating means off the power source.

A better understanding of the invention and further advantages thereof will be had by the following description which has regard to the appended drawings wherein:

FIG. 1 gives a perspective view of a log carrying conveyor alongside of which are positioned a plurality of feeding machines;

FIG. 2 shows a feeding machine of the invention in perspective elevation with some of the covering plates removed or partly cut away to show the internal structure;

FIG. 3 is a rear elevation view while FIG. 4 is a side elevation view of the same machine; again with some of the plates partly cut away;

FIG. 5 is the electrical diagram of the machine.

FIG. 1 illustrates the operation of feeding logs **1** from a conveyor **3** into one or several containers **5** by means of feeding machines **7**, each equipped with a reciprocating piston **9**. The piston reacts in response to activation of sensing means **11** by a passing log as will hereinafter be fully described.

Each feeding mechanism **7** is mounted on wheels rotatable on railings **13** and displaceable along conveyor **3**. As many machines as desired may be used and the larger the number, the faster the feeding into the containers **5**. Thus if four machines are used, as shown in FIG. 1, machine No. 1 should be arranged to strike only one out of four logs detected by sensing means **11**. This is possible by means of a counter that allows energization

of the actuating mechanism only after four logs have been detected. Similarly the next machine, or machine No. 2 is set to come into action every third log; machine No. 3 every second log and, finally, the last machine every passing log.

Furthermore the arrangement of containers **5** by pairs as shown in FIG. 1 and the distribution of the pushing pistons **7** right next to one another but on opposite sides of the conveyor permit to rapidly switch the positions of the pistons **7** so that they face an empty container again, whenever their corresponding one is full.

The feeding mechanism itself is best illustrated in FIGS. 2, 3 and 4 while the electrical diagram corresponding thereto is shown in FIG. 5.

As shown, operating piston **9** is mounted on a frame, comprising a table **15** which is supported by spaced lateral walls, that is, front wall **17** and rear wall **19**. Between front wall **17** and brackets **21**, projecting below table **15** and parallel to wall **17**, a series of shafts **22** are journaled, onto which are secured supporting wheels **23**. Each wheel **23** is provided with a circumferential V-shaped groove **25** adapted to roll over a guiding V-shaped ridge **27** fixed on the flange **29** of an upstanding I beam **31**.

It will be noted, from FIG. 4 particularly, that the table and piston considerably overhang supporting wheels **23** and I beam **31**. Equilibrium is maintained by means of a set of horizontal wheels **33** journaled on shafts **35** located between two parallel channel-shaped supports **37** fixed to rear wall **19**. Wheels **33**, like wheels **23** are also provided with V-shaped peripheral grooves **39** riding on V-shaped ridge **41** fixed to the flange **43** of a horizontal I beam **45**. Web **47** of this horizontal beam **45** also serves as support for I beam **31**. Finally a set of vertical wheels **49** mounted on front wall **17** has an inclined periphery which bears on the underside of flange **29**.

Machine **7** is brought into motion by means of motor **51** suitably coupled to a wheel **23** through speed reducer **52**, sheaves **53** and belt **55** and by means of motor controls (not shown).

On either side of piston **9** are located first and second actuating means **57** and **59** respectively (FIGURE 2) which serve to reciprocate the said piston. FIG. 4 shows, in dotted lines, the outline of the piston in its outermost position.

The sensing means **11** used for purposes of illustration comprises a source of light **61** which shines upon a photocell **63**. As is known, when a log passes under the light ray, it cuts it off and breaks an electrical circuit containing a solenoid which becomes deenergized. This may in turn, return a core located within the solenoid, to normal position under the action of a spring to close a circuit which will start the operation of piston actuation.

It is therefore to be assumed, under the above described conditions, that the conveyor belt **3** is narrower than the logs which extend past the edges thereof as shown in FIG. 4, to thus permit detection thereof.

In the diagram of FIG. 5, the first piston-actuating means comprises a first solenoid-operated double switch **65** and a first control mechanism **67**. The latter does the actual control of the piston in one direction. If the piston operates on fluid pressure such as compressed air, the control mechanism may be a solenoid-operated valve.

The second control mechanism is similarly composed of a solenoid-operated double switch **69** and second control mechanism **71**, similarly to first control **67**.

The operating circuit also comprises a two-pole selector switch **73**, a limit switch **75** and an end-of-course tripping mechanism only shown here as an elongated member **77**. This member **77** is coupled to the piston and follows the same movements. Double switches **65** and **69** are normally held open as by spring means and are brought to closed position by solenoids **79** and **81**.

The upper part of first double switch 65 is connected to the first control mechanism 67 and to a source of power 83 while the lower part is connected to the sensing means and to one pole of the two-pole selector switch 75.

The upper part of the second double switch 69 is connected to the second control mechanism 71 and to the source of power 83 while the lower part goes to the other pole of the two-pole selector switch 73 and to the limit switch 75.

Each of selector switch 73 and limit switch 75 is provided with a pivotable member 85, 85' respectively. Member 85 is resiliently held against the lower pole of the double-pole switch while member 85' is resiliently held in closed position.

Switches 73 and 75 are further provided with L-shaped levers 87 pivotable through shafts 89, 89' at the junction of the two legs. These levers are resiliently held so that one leg stands away from members 85 and 85'. The levers are pivoted alternatively by means of lugs 91, 91' located at the ends of elongated member 77 which moves in accordance with piston 9.

Sensing means 11 will include a trip switch 93 and may also have a push-button switch 95 and auto-manual switch 97. A counter may also be added, but this is optional. As mentioned above, such a known counter would be useful where several machines are used.

The device operates as follows:

When the trip switch 93 is momentarily closed in consequence of the passing of a log within the sensing means 11 range, or when the push-button switch is depressed, solenoid 79 is energized and double-switch 65 closed. At this time solenoid 79 is kept continuously energized through the lower pole of selector switch 73 and first control mechanism 67 is activated and pushes piston in the direction shown by arrow V_1. Elongated member 77 of the end-of-course mechanism follows suit until lug 91 reaches and pivots lever 87 which presses member 85 down to switch contact from the lower pole to the upper pole of the two-pole selector switch 73. At this moment, solenoid 79 is deenergized, first double switch 65 is opened and first control mechanism stops the piston in its out position. Concurrently, solenoid 81 becomes energized and closes second double switch 69 which brings second control mechanism 71 into actuation which moves the piston 9 in opposite direction, as indicated by arrow V_2.

Member 77 follows the piston 9 until lug 91' hits and pivots 87' which, in turn, rotates lever 85' to open limit switch 75. Solenoid 81 is deenergized and double switch 69 opens. The cycle is finished.

It should be noted that the energization of solenoid 79 of the first double switch only lasts the time that the lug is within the range of sensing means 11. However energization of the said solenoid is maintained, as mentioned above, by closure of double switch 65 through two-pole switch 73.

I claim:

1. Feeding mechanism for pushing articles off a travelling conveyor comprising: a frame; reciprocating piston means on said frame for pushing passing articles off said conveyor; sensing means for sensing a passing article; first and second actuating means for causing displacement of the piston of said piston means alternatively in opposite directions; a selector switch and a limit switch; an end-of-course tripping mechanism connected to said piston and reciprocating therewith; said first actuating means being connected to said sensing means and to said selector switch; said second actuating means being connected to said selector switch and said limit switch, first cooperating means between said tripping mechanism when in one

extreme position, and said selector switch adapted to transfer power from said first to said second actuating means; second cooperating means between said tripping mechanism, when in the other extreme position, and said limit switch adapted to cut off power from said second actuating means; whereby when said sensing means is activated by a passing article, it energizes said first actuating means which causes displacement of said piston and tripping mechanism in one direction and when said mechanism has reached said one extreme position, said first cooperating means actuates said selector switch to move the power to said second actuating means which causes displacement of said piston in the opposite direction, and when said piston and tripping mechanism has reached said other extreme position, said second cooperating means actuates said limit switch to cut off the power from said second actuating means.

2. A feeding mechanism for pushing logs and the like off a travelling conveyor comprising: a frame, reciprocating piston means mounted on said frame, adjacent said conveyor, for pushing logs and the like off said conveyor; sensing means actuatable during the passing of a log or the like; first and second actuating means for causing displacement of the piston of said piston means alternatively in opposite directions; a two-pole selector switch having a contact member normally resting on a first pole of said switch; a normally closed limit switch; an end-of-course tripping mechanism connected to said piston and reciprocating therewith; a power source; said first piston-actuating means including a first control mechanism permitting the motion of the piston in a first direction and a normally open first solenoid-operated double switch connected, on the one hand, to said first control mechanism and to said power source and, on the other hand, to said sensing means and to said first pole of said two-pole selector switch; said second piston-actuating means including a second control mechanism permitting motion of the piston in a second direction, opposed to said first direction, and a normally open second solenoid-operated double switch connected, on the one hand, to said second control mechanism and to said power source and, on the other hand, to said limit switch and to a second pole of said two-pole selector switch; first cooperating means between said end-of-course tripping mechanism, when said piston is in one extreme position, and said contact member to shift the latter from said first to said second pole of said two-pole selector switch and thereby deenergize said first solenoid-operated double switch and transfer power to said second solenoid operated double switch; second cooperating means between said end-of-course tripping mechanism, when said piston is in the other extreme position, and said limit switch to open the latter and deenergize said second solenoid operated double switch.

3. A mechanism as claimed in claim 2 wherein said sensing means comprises an adjustable counter adapted to permit energization of the first solenoid operated double switch only after the passing of a predetermined member of logs or the like.

4. A mechanism as claimed in claim 2, wherein the contact member of said two-pole selector switch is resiliently held against said first pole; wherein said limit switch is resiliently held in closed position and wherein said first and second solenoid-operated switches are resiliently held in open position.

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