Dec. 24, 1968 G. A. BILOCQ 3,417,854

SYSTEM FOR ELECTRO-MECHANICALLY FEEDING WOOD LOGS INTO SHAFTS

Filed June 22, 1967 3 Sheets-Sheet 1

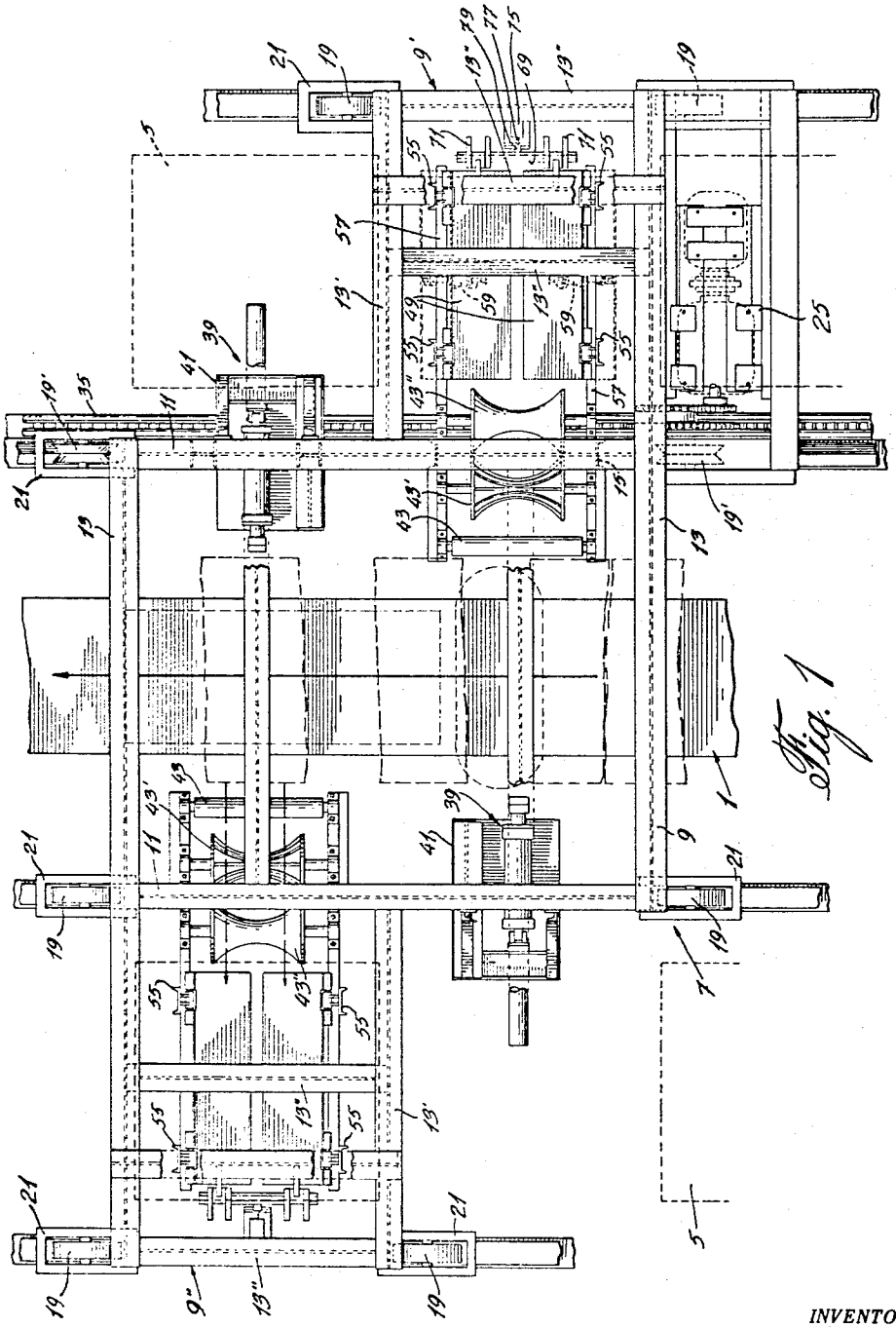


Fig. 1

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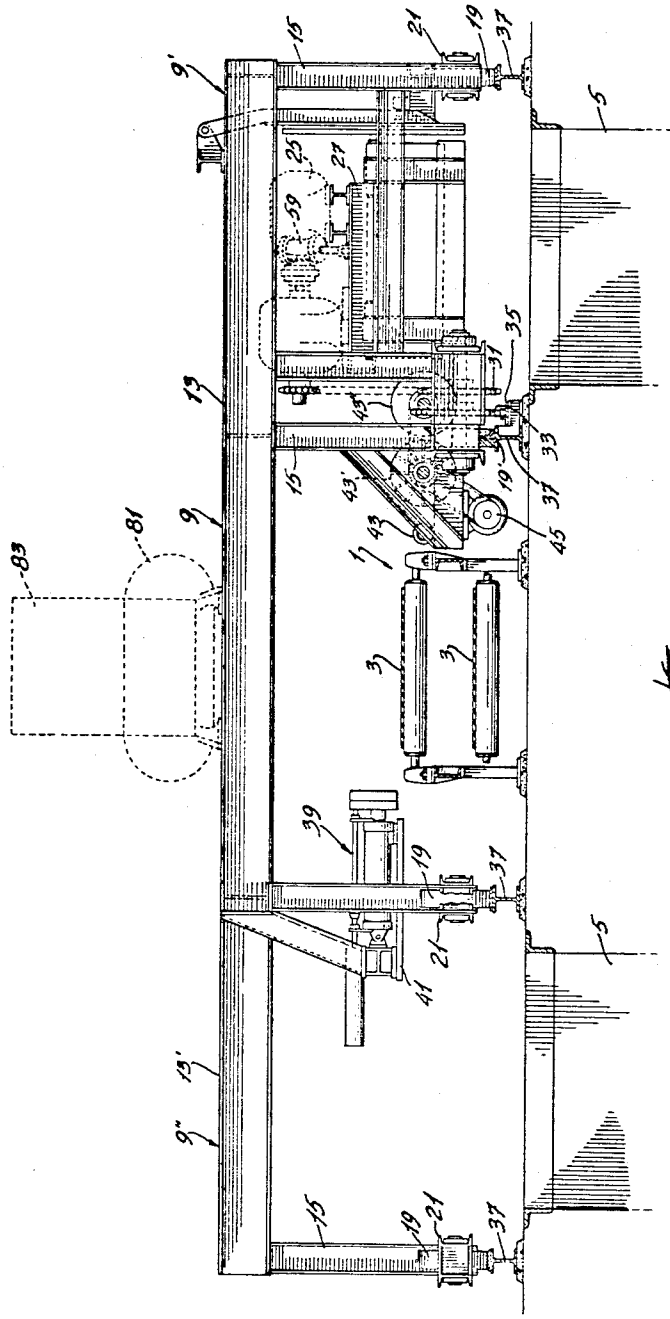


Fig. 2

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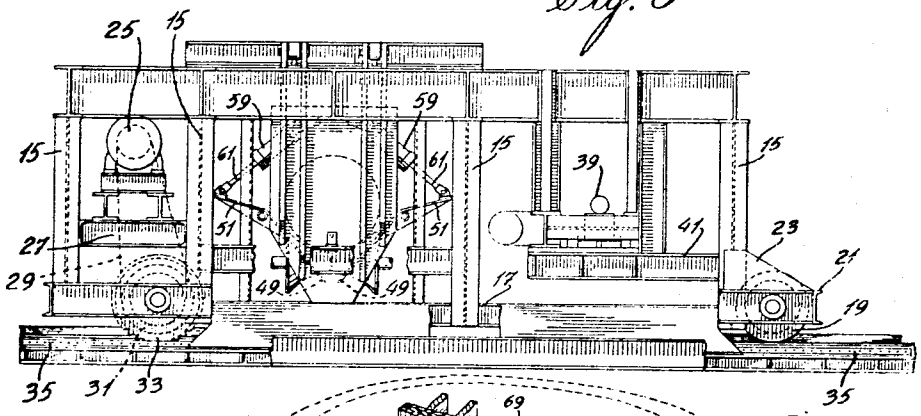
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Fig. 3



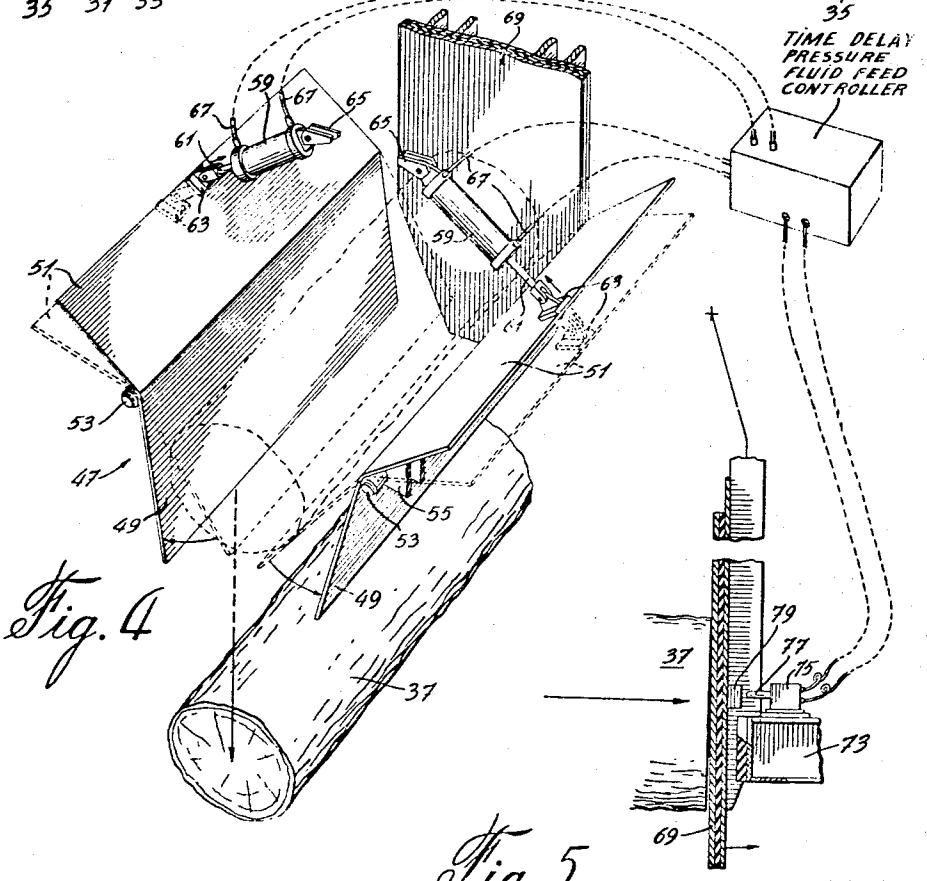


Fig. 4

Fig. 5

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3,417,854

SYSTEM FOR ELECTRO-MECHANICALLY FEEDING WOOD LOGS INTO SHAFTS

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ABSTRACT OF THE DISCLOSURE

The system comprises a travelling conveyor displaceable along aligned shafts and a vehicle mounted for displacement along the conveyor. A discarding piston is mounted on the vehicle on one side of the conveyor for striking the logs on the conveyor to drive them into the shafts, selectively. A hopper is provided on the vehicle, across the striking piston in relation to the conveyor, into which the logs are pushed by the piston, the hopper serving to ensure straightening and aligning of the logs prior to their being discarded into a shaft over which the hopper is positioned. The hopper is a V-shaped trough disposed to receive the logs longitudinally therein and formed of a pair of downwardly extending side plates inclined toward one another. An upstanding wall closes the trough on the side thereof opposite the conveyor to arrest the logs when the latter are pushed off the conveyor by the piston. The arresting wall hangs from the top to pivot, when struck by a log, to close a solenoid valve that actuates a time delay controller sending fluid to two hydraulic pistons operating the side plates to open the trough and allow the log to drop into the shaft after having been straightened.

The present invention relates to a system for mechanically feeding wood logs into vertically standing shafts.

The log shafts in question are aligned in rows adjacent a wood pile and vertically extend down into a crushing chamber adapted to mechanically reduce the logs into wood pulp for the manufacture of paper. Presently, the logs are fed into these shafts by hand, the attendant ensuring that they are properly straightened before dropping them into the shaft. It will therefore be easily understood that this manual handling is both costly and inefficient particularly with regard to the straightening and aligning of the logs. It will also be realized that such a method requires the presence of many laborers in order to ensure continuous feeding of the shafts.

It is therefore the purpose of the present invention to overcome the deficiencies in the presently used manual method by providing a mechanical system for feeding the wood logs into the shafts and ensuring their straightening and aligning prior to their dropping into the shafts.

This is obtained with a system according to the invention wherein a conveyor is mounted to travel along a row of shafts for conveying logs, previously disposed transversely thereon, to be fed into the shafts. A vehicle is mounted for displacement along the conveyor that carries a discarding piston on one side thereof for striking the logs on the conveyor and drive them into the shafts. A straightening and aligning assembly is further provided on the vehicle on the side thereof opposite the piston in relation to the conveyor, the assembly being brought selectively over the shafts and receiving the logs as they are

pushed off the conveyor prior to their being discharged into the shaft over which it stands.

In the preferred form of the invention, this assembly is formed of an elongated V-shaped trough arranged to receive the logs longitudinally therein and formed of a pair of downwardly extending side plates inclined toward one another. An upstanding wall closes the trough on the side thereof opposite the conveyor and serves to arrest the logs when the latter are pushed off the conveyor; the upstanding wall being mounted to move away from the trough when struck by a log. Motor means is provided to pivot the side plates of the trough to spread them apart at the apex thereof and allow discharge of a log after the latter is straightened and aligned. Finally, a time delay pressure fluid controller is provided that is operatively connected to the closing wall and to the motor whereby to energize the said motor in delayed action in response to movement of the closing wall when struck.

A better understanding of the invention will be afforded by the description that follows having reference to the appended drawings wherein:

FIG. 1 is a plan view of an assembly according to the invention;

FIG. 2 is a front elevation view thereof, the conveyor being shown in cross-section;

FIG. 3 is a side elevation view of the system;

FIG. 4 is a perspective view of a straightening and aligning trough;

FIG. 5 is a partial view of the hinged side wall shown being struck by a log.

With reference to the drawings, the system of the invention comprises a conveyor **1** having a conveyor belt **3** travelling alongside two rows of vertical shafts **5** extending down into the ground.

The system also includes a vehicle **7** formed, as shown in FIG. 1, of a central part **9** travelling over the conveyor, a rightward part **9'** displaceable over the rightward row of shafts **5** and a leftward part **9''** movable over the leftward shafts **5**. It will however be understood that the machine can of course be built with only the leftward or rightward part where there is a single row of shafts. In other words, the two parts are identical but in reverse in regard to the discharge direction of the logs. For the sake of clearness, the front elevation view of FIG. 2 illustrates a machine wherein only the rightward portion is shown with the complete equipment.

The vehicle is generally formed of an upper horizontal structure comprising a pair of lateral longitudinal members **11** to which are connected transverse members **13**. The upper horizontal structure of rightward and leftward parts **9''**, **9'**, comprise lateral extensions of members **13**, cross-members **13'** and lateral members **13''**. Depending from these members is a series of columns or risers **15** interconnected, at the lower end thereof, by longitudinal beams **17** (FIG. 3). The wheels **19**, **19'** are supported for rotation by a structural enclosure **21** welded to the risers **15** and stiffened by bracket **23**.

The power is provided by a motor and speed reducer assembly **25** mounted on a platform **27** secured to adjacent risers **15**.

As shown in FIGURES 2 and 3, a sprocket chain **29** connected to the reducer of assembly **25** drives a sprocket wheel **31** into rotation, the latter being coupled to a toothed wheel **33** in mesh with a toothed rack **35** mounted alongside one of the central rail **37'** over which the

wheels 19' travels. The remaining wheels 19 travels over similar rails 37.

As will be noted, the central wheels 19' have a V-shaped rim fitting over the top of rail 37' which is also V-shaped in cross-section.

It will therefore be understood that rotation of toothed wheel 33 over the toothed rack 35 will cause displacement of vehicle 7.

It will also be appreciated that many changes can be made to the illustrated structure of the vehicle 7 without departing from the spirit of the invention.

The wood logs 37 are disposed transversely on the conveyor belt 3 and properly aligned to be hit by a discarding piston 39. The straightening and aligning of the logs 37 on the conveyor belt 3 is obtained prior to the feeding into the shaft 1, by known devices.

Beneath the afore-described upper horizontal structure and adjacent conveyor 1 is a platform 41 provided at the level of the top of the conveyor 1 and over which is mounted the discarding piston 39. The latter is of the type described in my Canadian Patent Nos. 654,861, 670,279 and my U.S. Patent No. 3,040,861.

Conventional controls are used by the operator, standing on the vehicle, for displacing the latter so that the discarding piston 39 faces the shaft 5 into which the logs are to be driven. Similarly, conventional controls such as those described in the aforesaid patents are used for operating the discarding piston 39 to drive the logs into the selected shaft.

The rows of shafts 5 may stand at a distance from one another whereby to leave an appreciable space between them and conveyor 5, standing midway therebetween, as is the case here. In such a case, conveyor means will have to be provided to carry the logs 37 from the central conveyor 1 to the shaft 5. Preferably, and as best illustrated in FIGURES 1 and 2, this additional conveyor means is formed of motorized rollers 35, 35' and 35'' driven by a motor 45 through conventional chain and sprocket arrangement. In the preferred arrangement, roller 43 is cylindrical whereas rollers 43', 43'' are spool-like, with roller 43' being longitudinally indented to give it gripping power and help drive the logs toward the shaft 5.

As mentioned previously, prior to falling into the shaft, the logs 37 must be properly aligned and for this purpose, the invention proposes the use of a straightening and aligning assembly mounted on the vehicle at such a location as to centrally receive the logs when pushed off the conveyor by the piston 39.

More specifically, the straightening and aligning assembly comprises a generally V-shaped trough 47 disposed to receive logs 37 longitudinally therein and formed of a pair of downwardly extending side plates inclined toward one another. The said side plates 49 are bent outwardly at the upper end thereof to define the top portions 51. Side plates 49 are secured, at the bend, to hinge axles 53 pivotally mounted on bracket 65 secured to support 57 (FIGURE 1) fixed to the adjacent longitudinal member 11 and transverse member 13''. It will be noted that the top portion of the side plates 49 have been omitted in FIGURE 1, for the sake of clarity.

At least one pair of operating pistons 59 are provided for pivotal movement of the side plates 49 about the axis of the hinge axles 53. The rods 61 of the said piston are pivotally connected to the upper edges of the top portions 51 through suitable brackets 63. The opposite ends of piston 59 are pivotally connected to the upper horizontal structure such as by means of brackets 65 fixed to transverse member 13' illustrated in FIGURE 1.

The fluid lines 67 are connected to a conventional time delay pressure fluid controller to be referred to again hereinafter.

At the end of trough 47 opposite conveyor 1 is an upstanding log-arresting wall 69 mounted for displacement away from trough 47 when hit by a log. Wall 69 is preferably hinged at the top such as by means of conventional hinges 71, one part of which is secured to the adjacent transverse member 13'' (FIGURE 1). Hinges 71 allow swinging of arresting wall 69 about a horizontal axis whereby to allow the said wall 69 to swing away from trough 47 when hit by a log 37.

At the lower end of arresting wall 69 and slightly away therefrom when the latter is at rest position is a bumper guard 73 (FIGURE 5) secured to a suitable part of the vehicle 7. Over bumper guard 73 is a micro switch 75 the operating prong 77 of which projects in the direction of the arresting wall 69. The said prong 77 is positioned to be hit by a block 79 on the rearward face of the arresting wall 69.

The afore-described straightening and aligning assembly operates as follows:

In inoperative position, trough 47 is closed as shown in dotted lines in FIGURE 4. Whenever a log is pushed into this trough, it hits the arresting wall 59 which, through block 79 and prong 77, closes the micro switch 75 to energize the time delay pressure fluid feed controller. After a short period of time sufficient to allow the log to properly straighten in the trough 47, the said controller causes actuation of piston 59 in a manner to cause outward movement of the side plate 49 or opening of the trough to thus allow the log to fall into the shaft. Again after a short time, pistons 59 are actuated in reverse action by the controller to cause closing of the side plates 49 so that the trough is ready to receive another log.

The previously mentioned discarding piston 39 as well as the trough piston 59 may be pneumatic pistons in which case an air compressor 81 and air reservoir 83 may be provided at the top of the upper horizontal structure shown in dotted lines in FIGURE 2.

Although a specific embodiment has just been described, it will be appreciated that various modifications may be made thereto without departing from the spirit of the invention.

I claim:

1. A system for mechanically feeding wood logs into vertically extending log shafts aligned in at least one row, said system comprising:

(a) a conveyor mounted to travel along said row of shafts for conveying logs, disposed transversely thereon, to be fed into said shafts;

(b) a vehicle mounted for displacement along said conveyor;

(c) a discarding piston on said vehicle for striking logs on said conveyor and drive them into said shafts; and

(d) a straightening and aligning assembly on said vehicle so mounted thereon as to be selectively brought over said shafts and to receive said logs as they are pushed off said conveyor prior to their being discharged into said shafts.

2. A system as claimed in claim 1, wherein said straightening and aligning assembly comprises:

an elongated V-shaped trough disposed to receive said logs longitudinally therein and formed of a pair of downwardly extending side plates inclined toward one another;

an upstanding wall closing said trough on the side thereof opposite said conveyor for arresting said logs when the latter are pushed off said conveyor;

means mounting said closing wall to move away from said trough when struck by a log;

motor means to pivot said trough side plates to spread them apart at the trough's apex to allow discharge of a log after it is straightened and aligned, and

time delay pressure fluid control means operatively connected to said closing wall and to said motor; said control means operative to energize said motor in de-

layed action in response to movement of said closing wall when struck.

3. A system as claimed in claim 2, wherein said shafts stand at a distance from said travelling conveyor and conveyor means between said conveyor and shafts to convey said logs therebetween.

4. A system as claimed in claim 3, wherein said conveyor means are motorized rollers rotatable about axes parallel to the direction of displacement of said travelling conveyor.

5. A system as claimed in claim 4, wherein said rollers are mounted on said vehicle and are displaceable therewith.

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