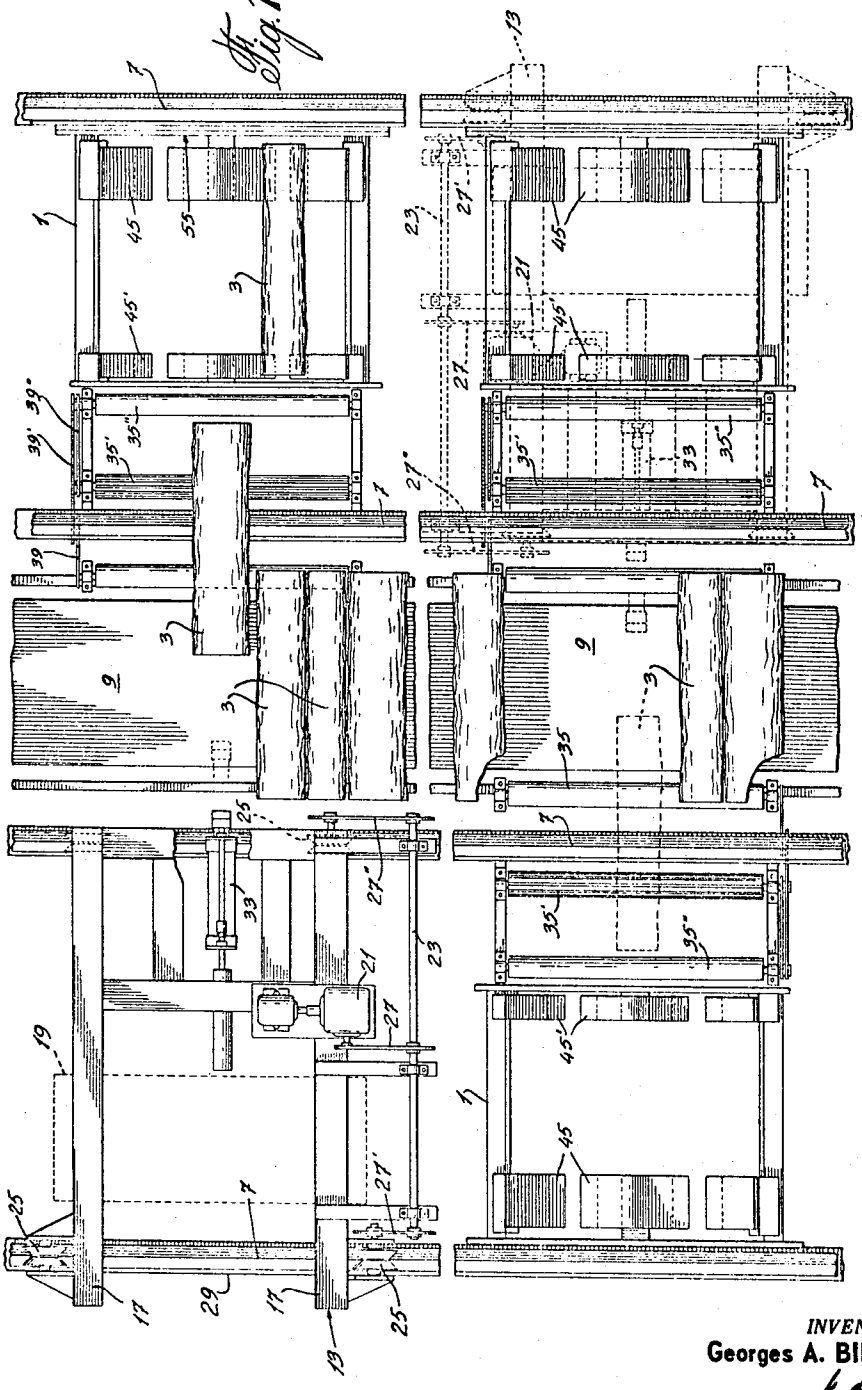
May 13, 1969 G. A. BILOCQ 3,443,676

SYSTEM FOR MECHANICALLY FEEDING WOOD LOGS INTO SHAFTS

Filed June 22, 1967 Sheet 1 of 3

Fig. 1



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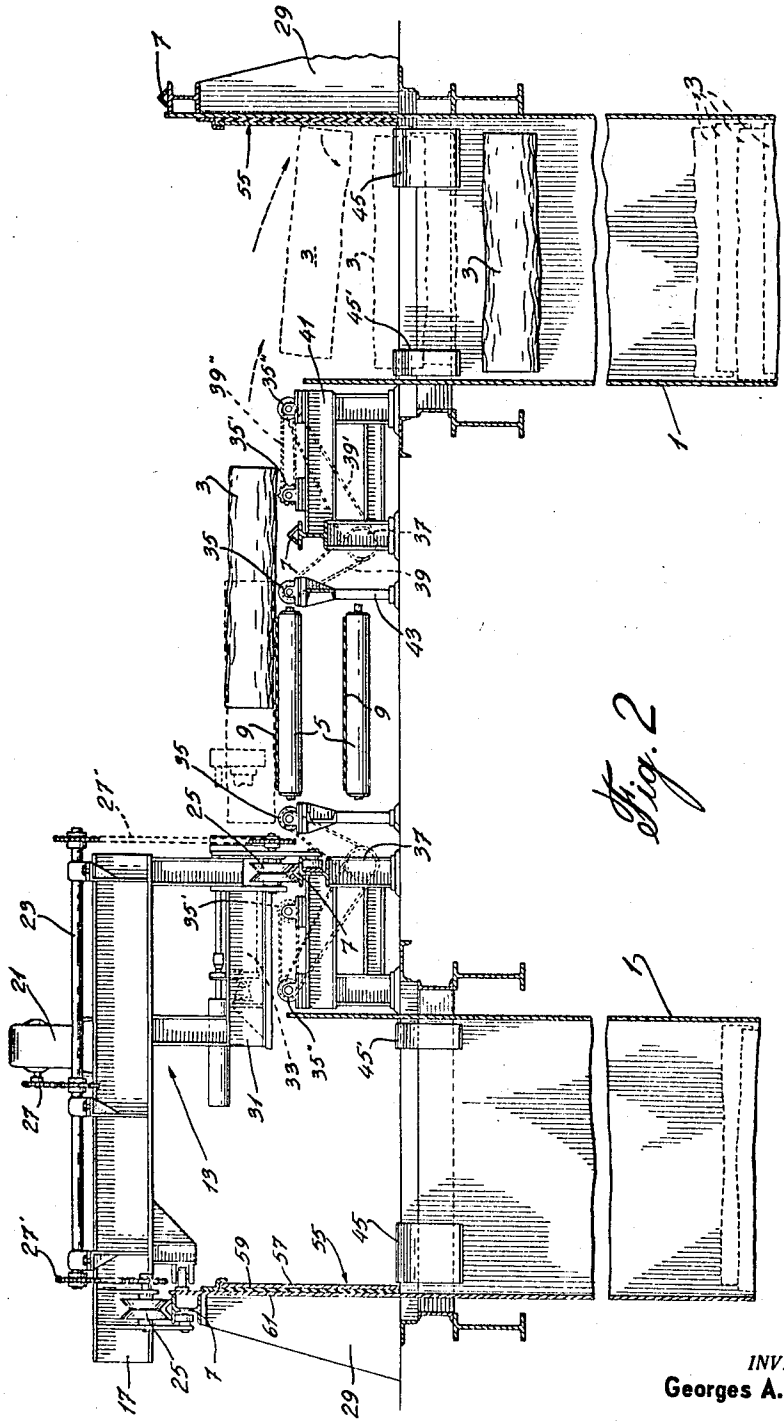

Fig. 2

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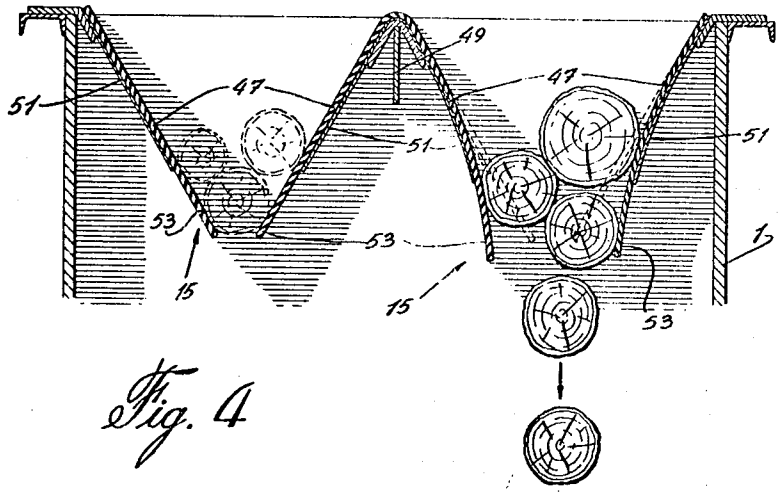

Fig. 4

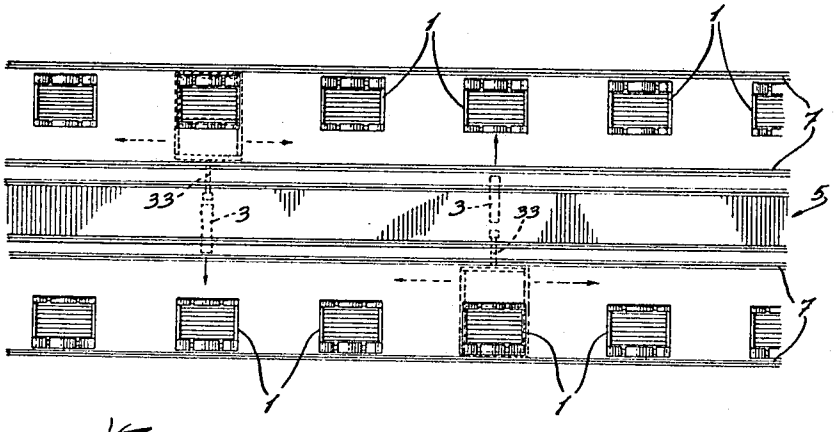

Fig. 3

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3,443,676

SYSTEM FOR MECHANICALLY FEEDING WOOD LOGS INTO SHAFTS

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Int. Cl. B65g 47/82, 57/18
U.S. Cl. 198—24 5 Claims

ABSTRACT OF THE DISCLOSURE

The system comprises a travelling conveyor displaceable along the shafts and a vehicle mounted for displacement along the conveyor. A discarding piston is mounted on the vehicle for striking the logs on the conveyor to drive them into the shafts, selectively. A hopper is provided at the mouth of each shaft to ensure straightening and aligning of the logs, along an axis which is generally normal to the longitudinal axis of displacement of the conveyor and before they drop into the shafts.

The present invention relates to a system for mechanically feeding wood logs into vertically extending log 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. Now, and as is known in the art, it is important that each log be straightened and aligned along a predetermined axis, which is usually an axis transverse to the line of shaft, before it is dropped into a shaft.

The straightening, aligning and dropping of the logs into the shafts is now done manually and it will thus be easily understood that this manual handling is both very costly and not too effcient in regard to the straightening and aligning of the logs. This method also requires the presence of many attendants in order to ensure proper feeding of the shafts to ensure continuous working of the grinding mechanism.

The purpose of the present invention is to provide a system for mechanically feeding the wood logs which can be operated by a single man without any effort and which includes a device for ensuring proper straightening and aligning of the logs as they enter the shafts.

More specifically, the system of the invention comprises a travelling conveyor mounted along the row of shafts and adapted to convey logs that are disposed transversely thereon to be fed into the shafts. A vehicle is mounted for displacement along the conveyor and has, mounted thereon, a discarding piston which is intended to strike the logs on the conveyor and drive them into the shafts. The latter are provided with means at the mouth thereof to ensure straightening and aligning of the logs in said shafts along an axis generally normal to the longitudinal axis of the conveyor.

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

FIGURE 1 is a plan view of a system made according to the invention;

FIGURE 2 is a side elevation view of the system of FIGURE 1 showing, in cross-section, portions of shafts into which logs are driven;

FIGURE 3 is a plan view of a pair of aligned rows of shafts;

FIGURE 4 is a cross-sectional view taken at the mouth of a shaft and illustrating the straightening and aligning means.

With reference to FIGURE 3, conventional installations

comprise aligned rows of vertical hollow shafts leading down into a crushing chamber wherein crushing stones are provided over which the logs 3 such as those shown in FIGURE 4, are directed so as to lie thereover and be reduced into mechanical pulp. Conventionally, log piles are built alongside the row of shafts and logs are manually disposed in the shafts, care being taken that the said logs are disposed therein with the longitudinal axis parallel with the axis of the grinding stones. It will therefore be appreciated that this manual handling is both costly and uncertain as to the actual disposition of the logs.

To overcome this disadvantage, the invention proposes an installation which generally comprises a conveyor 5, travelling between two rows of shafts 1. As shown in FIGURE 3, the logs 3 are disposed transversely on the conveyor belt 9 and properly aligned to be hit by a discarding piston 33 to be referred to again later. The straightening and aligning of the logs 3 on the conveyor belt 9 is done prior to the feeding into the shafts by known devices. The system also includes a vehicle 13 (FIGURE 2) displaceable longitudinally of conveyor 5 on a pair of tracks 7. There is to be one such vehicle to service each row of shafts, the two vehicles being identical except that one is designed to discard logs into the shafts opposite thereto in relation to conveyor 5 while the other vehicle discards the logs in the shafts of the other row. To complete the assembly, means is provided on each shaft and at the mouth thereof, in the form of a hopper 15, to ensure straightening and aligning of the logs as they fall in the shaft.

In the plan view of FIGURE 1, one leftward vehicle 13 drives the logs 3 into a rightward shaft 1 whereas a rightward vehicle 13 shown in dotted lines in FIGURE 1 drives the logs into a leftward shaft. It should be understood here that the two vehicles 13 operate independently of one another and it will further be understood that two vehicles 13 could of course be integrally connected although it is more effcient that they be detached.

The vehicle comprises an upper horizontal structure 17 over which is mounted a compressed air reservoir 19 and a driving motor and speed reducer unit 21. The driving unit 21 drives a shaft 23, mounted transversely on the upper structure 17, which in turn drives the vehicle wheels 25 riding over the rails 7, the connection between driving unit 21, shaft 23 and wheels 25 being obtained through any conventional means such as the sprocket and gear arrangement 27, 27', 27'' illustrated particularly in FIGURE 2.

It will be noted from the latter FIGURE 2 that the outward rails 7 in relation to the conveyor 5 are mounted on bumper guards 29 to be referred to again later.

Below upper horizontal structure 17 and adjacent conveyor 5 is a platform 31 provided at the level of the top of conveyor 5 and over which is mounted the discarding piston 33 of the type described in my Canadian Patents 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 33 faces the shaft 1 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 33 to drive the logs into the selected shaft as shown in FIGURES 1 and 2.

If the rows of shafts 1 stand at a distance from one another so as to leave an appreciable space between them and the conveyor 5, standing midway between as is the case here, conveyor means will have to be provided to carry the logs 3 from the central conveyor 5 to the shafts 1. Preferably, this additional conveyor means is formed of motorized rollers 35, 35' and 35'' driven by a motor 37

through conventional belt sprocket arrangements **39**, **39'**, **39''**. As shown here, rollers **35'**, **35''** are mounted on a table **41** whereas roller **35** is mounted on a pedestal **43**. It will be understood that there is one such further conveyor for each shaft **1**.

Also, a preferred arrangement would be to have rollers **35**, **35''** as smooth cylinders whereas roller **35'** is longitudinally indented to give it gripping power and help drive tthe logs toward the shaft **1**.

At the mouth and top of each shaft, as mentioned previously, there is provided means to ensure straightening and aligning of the logs **3** along an axis which is generally normal to the longitudinal axis of the conveyor **5**. Such means is in the form of the hoppers **15** mentioned previously.

Hopper **15** comprises at least one V-shaped trough, although two such troughs are preferred as shown in FIGURE 4. Similarly, rather than having each trough extending completely across a shaft **1**, it would be sufficient, cheaper and just as effective to have two short trough parts **45**, **45'** as clearly shown in FIGURES 1 and 2.

Each generally V-shaped trough is formed of a pair of cooperating independent downwardly directed lips **47** whose planes extend normal to the conveyor; lips **47** being constructed to spread apart at the apex of the trough under a predetermined weight of logs to allow passage of the logs therebetween. In the case where two such troughs, standing side-by-side in the shaft, are provided, as in FIGURE 4, it will be understood that the central lip of one trough may be combined with the center lip of the other trough or made of one piece as illustrated and fixed to a central arrow-shaped support **49** secured to the walls of the shaft **1**.

Each lip **47** comprises a flexible sheet **51** made of metal and secured, along the upper edge thereof opposite the trough apex, to the mouth of the corresponding shaft, along the side thereof or at the center as by being fixed to the central support **49**. Additionally, each lip comprises a sheet of stiff rubber **53** mounted over the sheet of metal **51**. Preferably, the sheet of metal **51** terminates short of the sheet of stiff rubber to increase the resiliency of the lip in the apex area of the trough.

The flexibility of lip **47** is to be such as to allow passage of logs under a predetermined weight such as when more than three logs are driven into the trough. In this manner, the logs are aligned prior to their being dropped in to the well and over the grinding stone, along an axis parallel to the axis of the grinding stone and normal to the direction of displacement of the conveyor **5**.

Finally, bumper guard **29** has a front wall **55** formed of an outer sheet of metal **57**, an intermediate sheet of rubber **59** and finally, a backing wall of metal **61**, the sheet metal **57** being replaceable. It will be understood that this front wall serves to stop logs **3** and allow them to drop into the aforedescribed hopper **15**.

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 means on said vehicle having a piston for striking logs on said conveyor and drive them into said shafts;

(d) means on each of said shafts and at the mouth thereof to ensure straightening and aligning of said logs prior to their dropping into said shafts, said straightening and aligning means comprising:

a generally V-shaped trough formed of at least one pair of independent downwardly directed lips whose planes extend normal to said conveyor;

each lip being made of resilient material and rigidly secured, solely along the edge thereof opposite the trough apex, to the mouth of the corresponding shaft, whereby said lips gradually spread apart at the apex of said trough under the weight of falling logs and allow passage of logs therethrough when the latter have reached a predetermined weight and, thereafter, automatically close up under the resiliency thereof, and

a wall closing said trough on the side thereof opposite said conveyor for arresting said logs when the latter are pushed off said conveyor.

2. A system as claimed in claim **1**, wherein each lip is formed of a resilient sheet of metal and of a sheet of stiff rubber mounted over said sheet of metal.

3. A system as claimed in claim **2**, wherein said sheet of metal terminates short of said sheet of stiff rubber to increase the resiliency of said lip in the apex area of said

4. A system as claimed in claim **1**, wherein each shaft comprises two contiguous V-shaped troughs, each lip comprising: an outer flexible sheet of metal secured, along the edge thereof opposite the trough apex, to the mouth of the corresponding shaft; an inner flexible sheet of metal secured to the said corresponding shaft centrally thereof, and a sheet of stiff rubber mounted over each sheet of metal.

5. A system as claimed in claim **4**, wherein said sheet of metal terminates short of said sheet of stiff rubber to increase the resiliency of said lip in the apex area of said trough.

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U.S. Cl. X.R.

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