

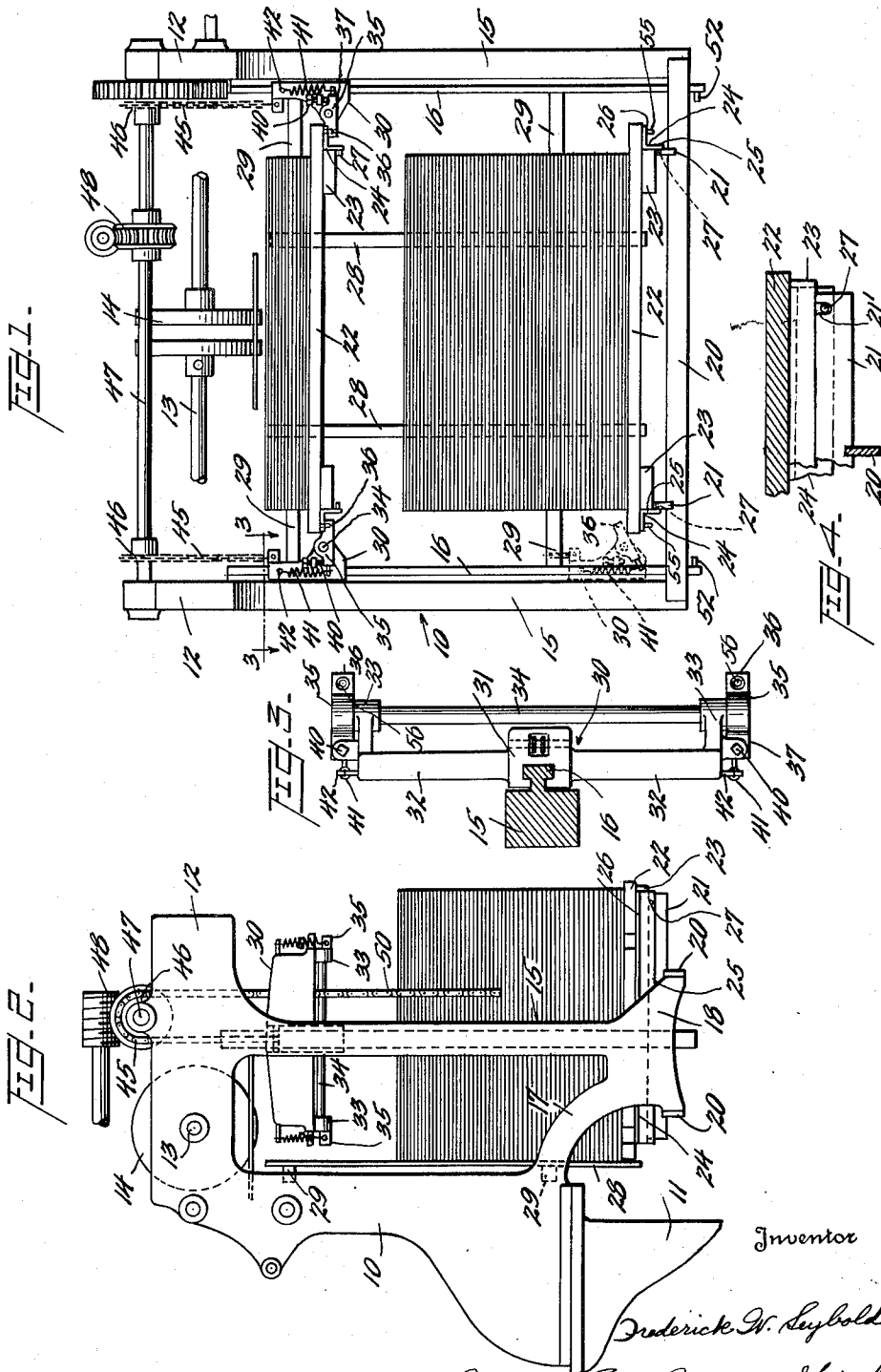
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DOUBLE LOADING PAPER PILE BOARD

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DOUBLE LOADING PAPER PILE BOARD

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This invention relates to paper pile boards for automatic paper feeders for use with printing presses and the like and deals particularly with lifting and elevating mechanisms for such boards whereby a reserve pile of paper may be stacked on a second board while paper is being fed from a partially unloaded one, and said second board automatically associated with the elevating mechanism upon the exhaustion of the paper on the first board.

It is the general object of the present invention therefore to provide novel and improved paper feed board loading and elevating mechanism.

An important feature of the invention resides in the provision of means for automatically associating a paper pile board with its lifting mechanism.

Another important feature of the invention resides in the construction and arrangement of lifting lugs carried by lifting brackets whereby a loaded paper pile board may be automatically engaged and lifted by a downward and then upward movement of the brackets, the downward movement taking place in the normal lowering of an empty pile board and the raising movement being performed in the operation of lifting the new pile toward position for feeding sheets from the top thereof.

Still another important feature of the invention resides in the manner of supporting the stationary pile board for loading and in the locating and guiding means for positioning the same accurately for cooperation with the lifting lugs.

Other and further features and objects of the invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawing and the following specification wherein is disclosed a single exemplary embodiment of the invention with the understanding that such changes and modifications may be made therein as fall within the scope of the appended claims without departing from the spirit of the invention.

In said drawing:

Figure 1 is an end elevation of a double loading paper pile board arrangement constructed according to the present invention;

Figure 2 is a side elevation thereof showing the same mounted on the frame of a printing press;

Figure 3 is a fragmentary horizontal section taken on line 3-3 of Figure 1 and showing the arrangement of a single lifting bracket; and

Figure 4 is a fragmentary view of a locking device for maintaining the pile board in position on the rails.

Automatic sheet feeding mechanism as commonly employed for supplying paper or similar sheet material to printing presses, or other devices for treating the sheets individually, usually

comprises a board or table upon which the paper is piled very carefully with all of the edges in alignment and mechanism to automatically elevate the board to maintain the top sheet of the pile always at substantially the same level for cooperation with suitable sheet separating and feeding mechanism which removes the sheets one at a time and delivers them to the printing press or other machine. The operation of loading the pile board, as it is called, is rather tedious and requires considerable time. With the usual arrangement, after the paper is exhausted from the pile board it must be lowered then re-loaded by hand with the requisite quantity of paper.

During this rather prolonged operation, the machine is at rest and is of course unproductive, while during the printing operations of the machine, the operator has but little to do because of the automatic devices which control substantially the whole printing cycle.

The present invention contemplates improved means whereby a second pile board, directly beneath the one which is being elevated to supply paper, is arranged in a position where it can be loaded during the removal of sheets from the first one, thus making use of the operator's time during the printing. When the paper on the first board is exhausted, the elevating mechanism therefor is reversed in the usual manner to return the board to its lowest position, but since a pile has already been built up beneath it, it comes to rest on top of this pile, but its lifting brackets continue their downward movements and automatically engage beneath the loaded pile board whereupon their direction of movement is again reversed and the loaded board starts to rise. The empty board is now removed from the top of the paper pile and can then later be placed in the lowermost position for re-loading.

The invention is shown as applied to the feeder 10 of the printing press 11. This feeder includes among other parts the pair of parallel and overhanging side frame members 12 between which is journaled the shaft 13 carrying the suction feed wheels 14 of any well-known construction and driven by suitable mechanism as is common in the art. For convenience, the pile elevating mechanism is associated with the frame of the feeder 10. Depending from the members 12 are the posts 15 preferably integral therewith and each having a T-track 16 on its inner face for a purpose which will be later described. Near its bottom, each post 15 is connected by a brace 17 to the adjacent frame member of the feeder and the enlarged junction 18 of 15 and 17 provides support for one end of the pair of transverse beams 20 suitably attached thereto.

Supported by and spaced on the beams 20 are

the parallel rails 21 which form the immediate supports for the lower paper pile board.

Such a board 22 of which at least two are provided is preferably substantially rectangular and while it is customary to form it of wood, it may be constructed of any suitable material. The one shown is reinforced by battens 23, the lower faces of which rest on the rails 21 as clearly seen in Figure 1. Further reinforcing the board are a pair of angle bars 24, each having the vertical flange 25 thereof substantially abutting the outer edge of the adjacent batten and with the horizontal flange 26 secured against the under face of the board very close to its edge. The vertical flange 25 of each angle bar is of greater depth than the batten and the flanges of the two bars are spaced apart in respect to the rails 21 such as to closely guide the board along these rails as it is slid into position and to prevent transverse movement thereof in respect to the rails. The rails 21 are notched at 21' at a definite position near their forward ends to receive pins 27 secured on the flanges 25 to thereby positively and accurately position the board both fore and aft while it is positioned transversely by the engagement of the rails and flanges 25. This positioning brings its rear edge close to the vertical back or piling guides 28 which are carried between the frame members 10 by the transverse bars 29 and no amount of vibration of the machines can serve to move the pile board on its rails.

Mounted to reciprocate on each T-track 16 is a pile board lifting bracket 30 comprising a heavy central portion 31 and horizontal extensions 32 which carry arms 33 extending inwardly at right angles thereto toward the pile board. Supported by the arms 33 is the fixed shaft 34, on each overhanging outer end of which is journaled a latch or lifting lug 35. Each lug includes the pile board engaging end 36 extending inwardly from the shaft and the stop engaging portion 37 extending outwardly from the shaft. Mounted above each portion 37 and threaded through a lug on the bracket extension 32 is an adjustable stop screw 40, the lower end of which is engaged by the portion 37 of the lug 35 to limit its movement under the action of the lug spring 41 connected between a pin on the portion 37 and a pin 42 near the upper part of the bracket extension 32. The stop screws also maintain the lugs in horizontal position when their inner ends are loaded.

The two brackets are suspended each by a chain 45, the two chains running over sprockets 46 on a shaft 47 rotatably mounted in the frame extensions 12 and driven by a suitable mechanism 48 for raising the brackets automatically in response to the requirements of the feed wheels. The opposite ends 50 of the chains merely hang free as shown in Figure 2. Stops in the form of pins 52 on the T-tracks limit the downward movement of the brackets to prevent them from being run off of their guides when the mechanism 48 is reversed to lower the brackets. Under normal conditions the bars 20 act as stops but when they are removed for any purpose the pins 52 limit the movement of the brackets.

The latching lugs 35 are so mounted and spaced apart, while at the same time facing toward each other from the opposite brackets, that the distance between their ends 36 is less than the overall length of the pile board.

In order to ensure the position of the pile board on the latching lugs in spite of the jars and vibrations incident to the operation of heavy machinery, it is found desirable to provide inter-

locking means between each lug and the pile board. Such means may include a vertical pin 55 secured to the horizontal flange 26 of the pile board reinforcing angle 24 and a hole 56 for receiving the same in the face of the lug. The hole is provided with a beveled countersink to act as a guide for the pin on entering the hole as the latch is lifted.

From the above, it will be seen that with a loaded pile board arranged on the rails, that when the brackets are lowered by operation of the mechanism 48, finally the ends 36 of the lugs will engage the upper surface of the board and further lowering of the brackets will cause tensioning of the springs 41 resulting from tilting the lugs, to and beyond the position as shown in dotted lines in Figure 1, and finally the lugs will be snapped back into their horizontal position but beneath the board. Upon reversing the direction of movement of the brackets, the lugs will be brought up beneath the horizontal flanges of the angle bars 25 and the board and pile of paper will be lifted. It is customary to lift the pile rapidly until the top sheet approaches the feed wheel when the automatic feed mechanism is thrown in.

As soon as the loaded board has been sufficiently lifted from the rails, a second board can be loaded thereon and the building of a new pile commenced. This building can advance as rapidly as the old board is elevated so that the new pile is ready for feeding immediately the old one is exhausted. The board supporting the new pile is connected to the lifting brackets by merely lowering them as previously described, the empty board assuming a position on top of the pile from whence it can be removed by the operator.

The arrangement of the lifting brackets, locking lugs and associated parts is such as to make it an extremely strong assembly and one capable of handling the tremendous load of a large pile of paper. The support for the lower board is such that it is automatically and accurately positioned and maintained with respect to the lines of movement of the lifting lugs and also in respect to the piling guides 28 so that no special care is required on the part of the operator when placing it in position.

The mechanism of the present invention is readily adapted to existing feeders and does not require any changes in the feeding mechanism or in the pile board lifting drive. The only changes required are in the brackets and in the provision of the supports and rails for the lower board.

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

1. In a loading device for pile elevating mechanism, in combination, a plurality of like flat, substantially rectangular tables, a stationary bottom support for one of said tables, a pair of lifting brackets vertically reciprocable at opposite ends of said support, latching lugs extending from each bracket toward the other bracket and mounted on a single shaft extending parallel to said bracket, the distance between said lugs in normal position being less than the length of any one of said tables whereby any table may rest on and be carried by the lugs, said lugs being pivoted to their respective brackets for movement above their normal position whereby they may automatically fold out of the way of a table on said bottom support and engage beneath said

table when the brackets are first lowered and then lifted.

2. In a loading device for pile elevating mechanism, in combination, a frame, a horizontal table support fixed to said frame, a plurality of like tables, lifting brackets vertically reciprocable at opposite ends of said support and adapted to carry a loaded table to raise the pile thereon for delivery, guides for said brackets carried by said frame, latch lugs pivoted to each bracket and extending toward the opposite one, said lugs taking under the ends of a table to support it from the brackets, the pivots extending parallel to the engaged edges of the table, stops to limit the downward movement of the table engaging portions of the lugs, said portions being free to move upward to pass around the edges of a table mounted on said support when the brackets are lowered and means to bias said lugs to table engaging position.

3. In a loading device for pile elevating mechanism, in combination, a frame, a support fixed to said frame and adapted to have a table rest horizontally thereon, a table substantially rectangular and fitted with reinforcing angle bars permanently fixed beneath opposite edges thereof, guides mounted on said frame, a bracket mounted for vertical reciprocation on each guide in a path extending close to a reinforced edge of the table and multiple means on each bracket automatically engageable beneath the adjacent angle bar when the brackets are lowered and then raised whereby the table can be elevated by the brackets.

4. In a loading device for pile elevating mechanism, in combination, a frame, a support fixed to said frame and adapted to have a table rest horizontally thereon, a table substantially rectangular and fitted with reinforcing angle bars beneath opposite edges thereof, guides mounted on said frame, a bracket mounted for vertical reciprocation on each guide in a path extending close to a reinforced edge of the table, means on said brackets automatically engageable beneath said angle bars when the brackets are lowered and then raised whereby the table can be elevated by the brackets, and means on said support engageable by said angle bars to position the table edges laterally in respect to said brackets.

5. In a loading device for pile elevating mechanism, in combination, a frame, a support fixed to said frame and adapted to have a table rest horizontally thereon, a table substantially rectangular and fitted with reinforcing angle bars beneath opposite edges thereof, guides mounted on said frame, a bracket mounted for vertical reciprocation on each guide in a path extending close to a reinforced edge of the table, means on said brackets automatically engageable beneath said angle bars when the brackets are lowered and then raised whereby the table can be elevated by the brackets, means on said support engageable by said angle bars to position the table edges laterally in respect to said brackets, and cooperating means on the support and angle bars to position the table longitudinally.

6. In a loading device for pile elevating mechanism, the combination of a pair of spaced side frames, a vertical guide carried by each frame, a bracket reciprocable on each guide, means to raise and lower the brackets in unison, a pair of horizontal, spaced, parallel rails supported from and between the lower ends of said frames

and extending at right angles to a plane through said guides, a paper carrying table adapted to rest for substantially its full length on said rails, an angle bar secured under each lateral edge of the table with the vertical leg of each bar positioned by the outer edge of a corresponding rail and latch means on each bracket to automatically pass by the lateral edges of the table as the brackets are lowered and to then engage under the other legs of said angles as the brackets are then raised to lift the table.

7. In a loading device for pile elevating mechanism, the combination of a pair of spaced side frames, a vertical guide carried by each frame, a bracket reciprocable on each guide, means to raise and lower the brackets in unison, a pair of horizontal, spaced, parallel rails supported from and between the lower ends of said frames and extending at right angles to a plane through said guides, a paper carrying table to be slid upon and adapted to rest for substantially its full length on said rails, an angle bar secured under each lateral edge of the table with the vertical leg of each bar positioned by the outer edge of a corresponding rail, latch means on each bracket to automatically pass by the lateral edges of the table as the brackets are lowered and to then engage under the other legs of said angles as the brackets are then raised to lift the table, and stop means on the vertical legs of said angle bars to engage the said rails to fix the position of the table on the rails.

8. In a loading device for pile elevating mechanism, in combination vertically reciprocable lifting brackets spaced apart and facing each other, a pile supporting table adapted to fit between said brackets, vertical piling guides adjacent one edge of the table, latches extending from each bracket toward those on the other and adapted to engage under said table to support the same, a stationary support for a second similar table at substantially the lower limit of movement of the said brackets, means slidably receiving said second table on said support, means fixing said table in respect to the said guides, means mounting said latches for automatically engaging the lower table when the brackets are lowered, and pin and socket means on the latches and board to cooperate to positively position the board both laterally and longitudinally in respect to said lifting brackets and said piling guides.

9. In a loading device for pile elevating mechanism, in combination, a frame, a support fixed to said frame and adapted to have a table rest horizontally thereon, a table substantially rectangular and fitted with reinforcing angle bars beneath opposite edges thereof, guides mounted on said frame, a bracket mounted for vertical reciprocation on each guide in a path extending close to a reinforced edge of the table, means on said brackets automatically engageable beneath said angle bars when the brackets are lowered and then raised whereby the table can be elevated by the brackets, means on said support engageable by said angle bars to position the table edges laterally in respect to said brackets, a notch in the top of said support and a pin extending laterally from a table angle bar engageable in said notch to positively fix the table longitudinally in respect to the support.

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