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S. W. YATES

2,265,617

PRESS FEEDER

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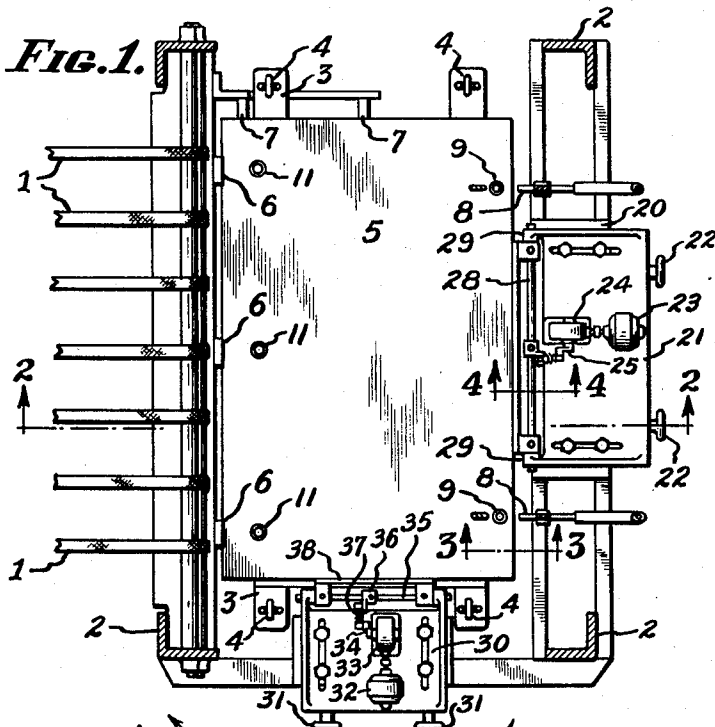
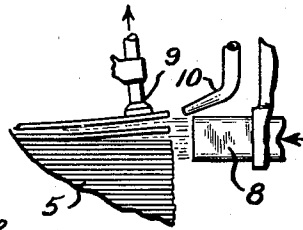


FIG. 3.

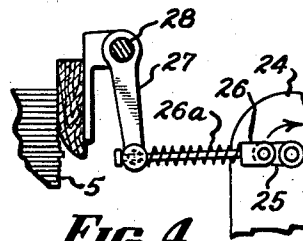


FIG. 4.

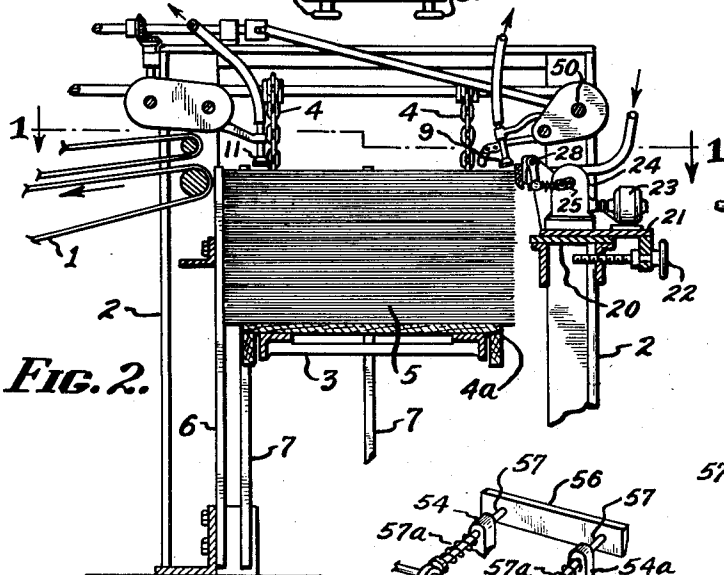


FIG. 2.

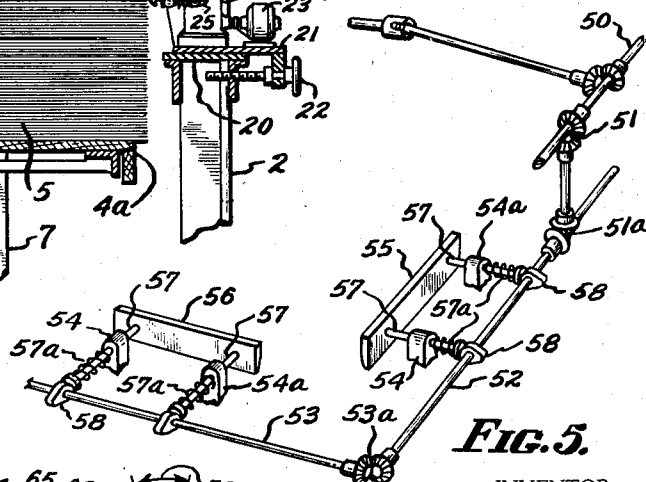


FIG. 5.

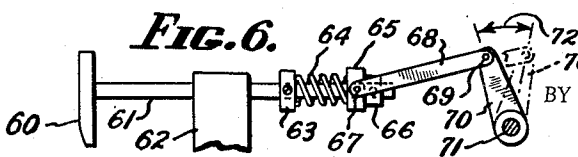


FIG. 6.

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2,265,617

PRESS FEEDER

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1 Claim. (Cl. 271—30)

My invention relates to press feeders which feed large sheets of paper or paperboard to a press. There are several types of such feeders which operate on the principle of lifting the topmost sheet of paper from a pile and feeding it by means of a suction device or other means into the press. In such devices one requirement as hitherto practiced, is to provide on the paper support for a pile of correctly aligned sheets superimposed on each other. This requires that the sheets as they come from the sheet cutting apparatus be shifted a few at a time onto the paper support of the feeder, and it has not been practical to simply transfer the skid of paper as it comes from the paper mill or sheet cutter, to the paper support on the machine without repiling the sheets.

It is the object of my invention to avoid this necessity for repiling, thus saving considerable labor in the transfer of paper and paperboard sheets to a press feeder. The theory of my device is to provide means which jogs the topmost sheets of a pile into correct position to be operated upon by the feeder, leaving the rest of the sheets in whatever position they come on the skid from the sheet cutter. The topmost sheets in such feeders are usually freed from the sheets lying below by the application of an air blast to the upper few sheets in connection with the vacuum lifting off device, and it is easy to jog such sheets into line against the abutment bars in the press feeder against which it has customarily been the practice to pile the sheets in loading the feeder, by laborious hand work.

I accomplish my object by that certain construction and arrangement of parts of which I give several examples in my specification which follows and illustrate in the appended drawing. The novelty over the art in devices following my invention, so illustrated, will be set forth in the ensuing claim.

In the drawing, Figure 1 is a sectional top plan view, taken along line 1—1 of Figure 2, of a press feeder to which has been added my sheet aligning device.

Figure 2 is a section thereof on the line 2—2 of Figure 1.

Figure 3 is a section thereof on the line 3—3 of Figure 1.

Figure 4 is a section thereof on the line 4—4 of Figure 1.

Figure 5 is a perspective, somewhat diagrammatically illustrating a different drive for the aligning mechanism.

Figure 6 illustrates another arrangement

whereby the joggers are provided with cushioned actuating means.

Referring first to the press feeder, I have not attempted to show a complete feeder. The belts on which the sheet removed from the feeder are fed away are shown at 1, the frame of the feeder at 2, and the sheet carrier at 3, same in this instance being elevated slowly as the feeder operates by chains 4. A skid 4a of paperboard sheets 5, is shown as mounted on the sheet carrier or platform 3. A further part of the feeder to be noted is the alignment bars, there being shown three front alignment bars 6, and two side alignment bars 7. There may be more of such bars or less of them provided that the topmost sheet when located in abutment with both sets of bars is in the proper position to be lifted away.

The sheet feeding device includes, in this example, a series of mechanisms operating in a timed relation from a shaft of the feeder. They include a pair of flat tube blowers 8 which direct a blast of air against the top few sheets at the front of the pile 5. As shown in Figure 3, this breaks the vacuum between the topmost lot of sheets, which incidentally assists my jogging device. This blower acts first in a series of operations. As it starts to blow, a pair of suction fingers 9 come down against the topmost sheet (see Figure 3) lifting the sheet at its back edge, away from the other sheets of the pile. As soon as this lifting takes place, a second air blast tube 10 shifts to a position beneath the lifted up portion of the topmost sheet and sends a blast of air under this sheet to lift it up from the pile. At the same time the front suction fingers 11, come down and attach themselves to the sheet, and as the tube 10 blasts up the sheet, these front fingers lift up and move over to raise the sheet above the front guide bars, and pass it onto the feed belts which rapidly move it away into the press.

This operation takes place very quickly, one sheet clearing the pile when the next operation begins to take place.

My novel mechanism can operate in synchronism with elements of this feed device, or continuously. In the form principally illustrated I provide on the back of the feeder, near the top of the pile of sheets thereon a plate 20, which supports a sliding base 21, adjusted in position by means of screws 22 engaging a turned down portion of the base and threaded into the support of the plate. This construction is best seen in Figure 2. Mounted on the base is a small motor 23 which runs continuously, and drives through a gear reduction unit 24, a crank 25.

The crank 25 is connected to a link 26 around which is a spring, said link having a loose connection held by the spring, with a lever 27. The lever 27 serves to rock the shaft 28 which is mounted on brackets 29, 29 on the adjustable base plate. Finally, on the rock shaft is located a jogging plate, say of wood, which engages the upper few sheets of the pile located in the machine, and pushes them toward the front alignment bars.

At the side of the machine on a suitable support is another adjustable base plate 30, adjusted in place by screws 31 (Figure 1) which engage in threaded holes in the legs of the support. There is a constantly driven electric motor 32, a reduction gear box 33, and a crank 34. Again on brackets on the adjustable base plate is a rock shaft 35, connected to the crank by means of a lever 36, and a spring housed loose link connection 37 to the crank. The jogging plate 38 on the rock shaft is located to push the sheets on top of the pile toward the side alignment bars 7 of the sheet feeder machine.

Now, should the pile of sheets not be in true vertical alignment, the jogging devices will continually push the top sheets on the pile to the proper position against the front and side alignment bars, so that the feeder finger will act properly and the sheet be delivered in correct position to the press. The adjustment of the base plates of the jogging devices will take care of different sized piles of sheets. The action of the first noted blower pipe will serve to facilitate the shifting of the sheets upon each other in jogging them into alignment.

In the form shown in Figure 5 I have indicated the shaft 50, which is the one that drives the sheet lifting devices at the rear of the machine and controls the blower tubes. By means of gearing 51 and 51a, this shaft is caused to drive the shaft 52, which in turn drives the shaft 53 by means of bevel gears 53a. The brackets for holding the jogging plate structures are shown at 54 and 54a, for the side and rear of the machine. The jogging plates 55 and 56, are held on rods 57 slidably held in the brackets. Springs 57a surround the rods, where they extend beyond the brackets, and cause their outer ends to bear against cams 58 on the two shafts 52 and 53 respectively. Hence, as the said shafts revolve the jogging plates are pushed in and out. This operation may be in time with the first blower operation or may just precede its operation, so that

the jogging motion does not interfere with the application of the suction fingers to the sheets.

In practice this timing arrangement with the air blast is desirable but not always necessary as the topmost sheets are forced in correct position against the several alignment bars, when my first device is in operation. In certain application it might be necessary, however, where the operation is only intermittent.

In the arrangement shown in Figure 6, the jogging member 60 is mounted on a pair of reciprocating rods or other suitable members 61, which in turn are provided with bearing means 62. The rod 61 has fixed thereon a collar 63 against which a spring 64 abuts. Bearing against the spring 64 a second collar 65 is slidably mounted on rod 61 being retained thereon by a fixed collar 66.

The collar 65 has a pivoted connection 67 to a link 68 which link at its other end is pivoted at 69 to a lever 70 fixed on shaft 71. As indicated by the arrow 72, I may in this case provide shaft 71 with oscillating movement and it will be apparent that the in and out movement imparted thereby to member 60 will be cushioned by spring 64.

Thus, if any sheet should be somewhat oversize, the jogging member will give sufficiently to move it against the abutments without marring the edge. The structure shown in Figure 4 has the same function since it is the spring 26a on the connecting rod which directly energizes the rocker arm 27.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

In a press feeding device for lifting sheets one at a time from a pile, and delivering them to a press, and having a movable platform for gradually raising a pile of sheets for presentation of the uppermost sheet to said delivering device, the combination of position locating fixed abutment means for the sheets of such pile located adjacent the operating level of the delivering device, against which abutment means the sheets are to be located, an air blast presented to the side edges of the uppermost sheets of the pile, and a jogging device arranged to intermittently present position adjusting blows to the edges of the uppermost sheets of the pile only, said blows directed to jog the said uppermost sheets against the said fixed abutment means.

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