

Dec. 10, 1957

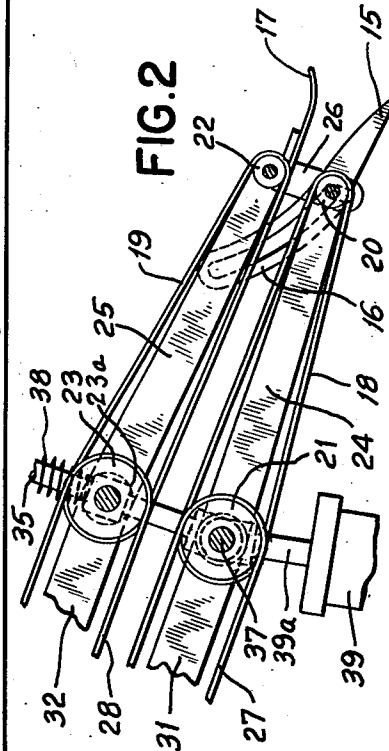
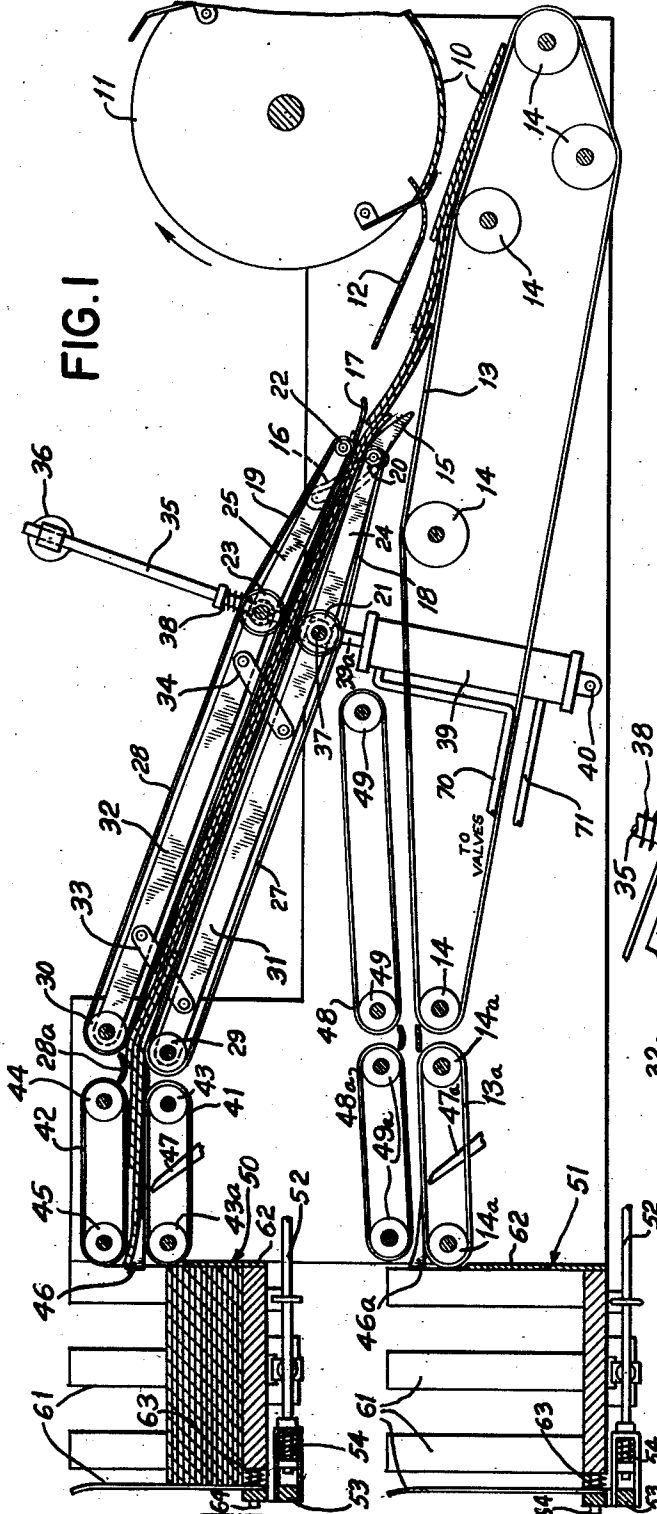
H. W. FAEBER

2,815,949

APPARATUS FOR RECEIVING PRINTED MATERIAL

Filed Feb. 1, 1955

2 Sheets-Sheet 1



INVENTOR.
HARRY W. FAEBER
BY
Campbell, Brumbaugh,
Free & Graves
ATTORNEY

Dec. 10, 1957

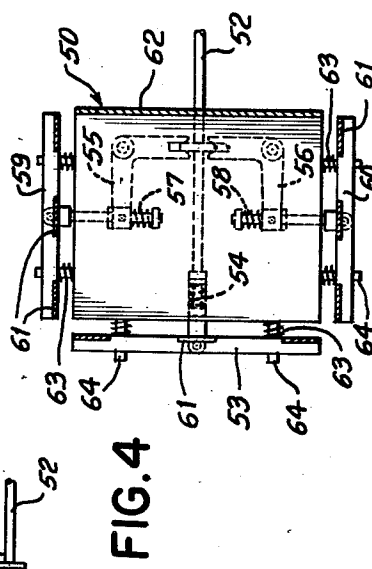
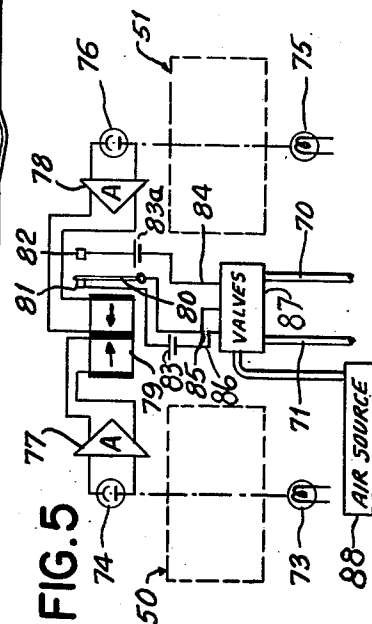
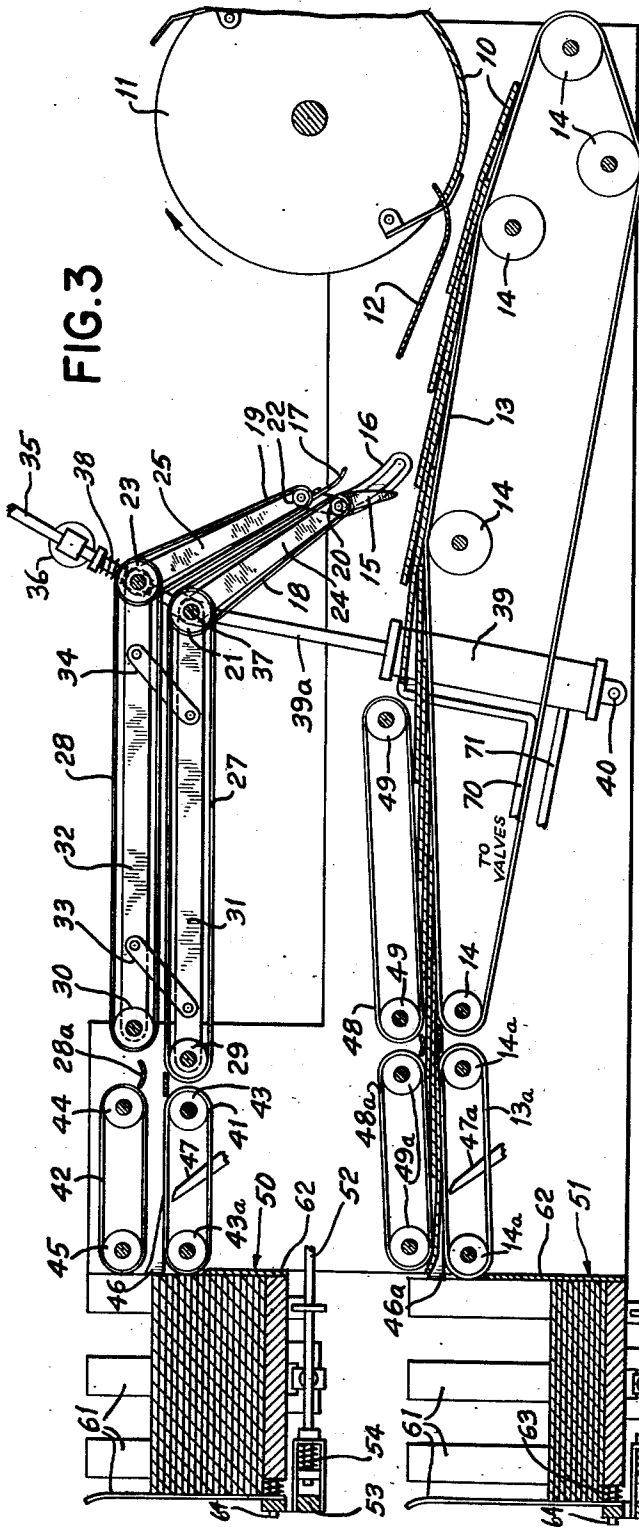
H. W. FAEBER

2,815,949

APPARATUS FOR RECEIVING PRINTED MATERIAL

Filed Feb. 1, 1955

2 Sheets-Sheet 2



INVENTOR.
HARRY W. FAEBER
BY
Campbell, Brumbaugh,
Free & Graves
ATTORNEY

1

2,815,949

APPARATUS FOR RECEIVING PRINTED MATERIAL

Harry W. Faerber, Larchmont, N. Y., assignor to Time, Incorporated, New York, N. Y., a corporation of New York

Application February 1, 1955, Serial No. 485,442

3 Claims. (Cl. 271-64)

This invention relates to apparatus for handling the product delivered by the folder of a printing press, and more particularly to apparatus for the picking and stacking of an uninterrupted flow of signatures from such folding mechanisms.

In modern high speed printing mechanisms, the printed webs are formed into ribbons which are cut and folded into signatures. After removal from the folder, the signatures are jogged manually to arrange them in neat stacks. In this operation, a relatively great amount of manual labor is required and, at today's constantly increasing press speeds, the number of the so-called "fly boys" required to handle the enormous output of printed signatures would reach the point where they would actually get in each other's way. This renders manual jogging impractical and uneconomical at high speeds.

Attempts have been made in the past to mechanize the jogging operation by equipping the folder delivery with automatic jogger boxes, but no satisfactory solution has heretofore been found. One of the most serious difficulties was encountered in unloading the jogger boxes, because the single box at the end of a delivery must be emptied by hand while the signatures keep piling in from the folder.

Accordingly, it is a primary object of this invention to provide means to divert a flow of signatures to an empty receptacle while a first loaded receptacle is being cleared.

It is a further object of this invention to provide apparatus for automatically diverting a flow of signatures from a loaded receptacle to another receptacle without interrupting the flow of signatures from the folder.

These and further objects of the invention are accomplished by providing two conveying systems terminated by receptacles, such conveyors being fed by a flow of signatures from a cutting and folding device. As soon as one of the receptacles is filled to capacity, switching means may be actuated (automatically, if desired) to divert the flow of signatures to the other receptacle along the appropriate conveying system.

Other objects and advantages of the invention will be more easily understood when the following description is read in connection with the accompanying drawings in which:

Figure 1 is a view in elevation of apparatus embodying the invention in one operating condition;

Figure 2 is an enlarged view of a portion of the apparatus shown in Figure 1;

Figure 3 illustrates the apparatus of Figure 1 in another operating condition;

Figure 4 is a plan view of a preferred form of jogger box employed in the invention; and

Figure 5 is a schematic diagram of one form of switching circuit that may be employed in the apparatus of Figure 1.

Referring to the above drawings and particularly to Figure 1, signatures 10 are removed from a gripper cylinder 11 by a stripper 12, the cylinder 11 comprising the last member of a conventional cutting and folding device, not shown for simplicity. A plurality of conventional delivery tapes 13, supported and driven by driving rolls 14, are suitably positioned with respect to the gripper cylinder 11 to receive the signatures 10 and transport them into engagement with a slidably mounted

2

pick-up nose 15, in the form of a scoop, supported by a curved slide 16 as shown in detail in Figure 2. The scoop 15 is designed to cooperate with a curved guide member 17 to deposit the signatures between moving tapes 18 and 19. These last mentioned tapes are supported and driven by rolls 20 to 23, respectively, which in turn are mounted on side members 24 and 25, respectively. Connected between the side members 24 and 25 is a link 26, shown in Figure 2, slotted to allow the conveyor to accommodate signatures having various thicknesses.

The tapes 18 and 19 carry the signatures 10 to another pair of tapes 27 and 28 supported and driven by rolls 21, 29 and 23, 30, respectively. These last mentioned rolls are mounted on supporting members 31 and 32 which are joined by pivotally mounted angularly disposed links 33 and 34. As is evident from the drawing, the parallelogram mounting of the links will allow the tapes to accommodate signatures having various thicknesses, the weight of the assembly including the tapes 28 being sufficient in most instances to properly engage and aid in carrying such signatures. If desired, additional weights or spring biasing may also be employed to increase the pressure between the two tape assemblies.

In order to provide proper cooperation between the upper and lower tapes, a rod 35, slidably supported by both a pivoted guide 36 and an assembly 23a mounting the rolls 23, is joined to a shaft 37 supporting the rolls 21. The rod 35, together with a spring assembly 38 joined thereto, insures the proper cooperation between the upper and lower tapes under all operating conditions.

An air cylinder 39, carrying an operating arm 39a, is anchored at one end to a suitable supporting point 40 and the other end is pivotally joined to the shaft 37. Air lines 70 and 71 serve to operate the cylinder 39 for positioning the conveyors as will be detailed hereinafter. It should be understood that other suitable mechanisms such as a solenoid or a motor with suitable gearing may be substituted for the air cylinder 39 within the scope of this invention.

The flow of the signatures 10 is carried by the tapes 27 and 28, with the aid of a guide plate 28a, to tapes 41 and 42, supported and driven by rolls 43, 43a and 44, 45, respectively. The tapes 41 and 42 run at substantially higher speed than the tapes 27 and 28, thus speeding up the signatures 10 before feeding them into a jogger box 50. Before reaching the jogger box 50, the signatures encounter a curved guide 46, raised on both sides and disposed to insure the proper entry of the signatures 10 into the jogger box without sagging. Such guides serve to arch the signatures thereby lending them "beam strength" and preventing buckling. An air jet may also be introduced by a tube 47 to actually float the signatures by a stream of air into the jogger box 50.

Referring next to Figure 3, the upper conveyor assembly is shown in its withdrawn position and the signatures 10 accordingly follow an alternate path. After being stripped from the gripper cylinder 11, the signatures are conveyed, as previously explained, on the tapes 13. However, since the scoop 15 is no longer in an operative position, the signatures will continue on the tapes 13 into engagement with tapes 48, supported and driven by appropriately mounted rolls 49. High speed tapes 13a and 48a are driven by rolls 14a and 49a, respectively, and form a continuation of low speed tapes 13 and 48, respectively, to speed up the signatures 10 before feeding them into a jogger box 51. Disposed at the conveyor entrance to the jogger box 51 is a guide 46a and an air jet nozzle 47a performing as indicated above in connection with the guide 46 and the nozzle 47.

The jogger box 50 is shown in detail in Figure 4 and will be described with reference thereto. A jogger rod

52, reciprocating with a short stroke on the magnitude of one-half inch with a frequency high enough to deliver two complete jogs per signature, is joined to a front plate 53 by a spring assembly 54 and connected by two bell cranks 55, 56, and corresponding spring units 57, 58 to side plates 59 and 60, respectively. The front and side plates are formed from horizontal bars to which are attached a number of vertical strips 61. A stationary rear plate 62 is provided in the jogger boxes. Preferably, the front and side plates are spring mounted by employing conventional coil springs 63 in connection with guide rods 64, such construction permitting the jogger boxes to accommodate oversized signatures without crushing them. It is evident that the jogging action will settle the signatures by removing any air remaining in the stack.

One form the switching circuits for controlling the air cylinder 39 may take is shown schematically in Figure 5. Disposed on opposite sides of the jogger box 50 is a light source 73 and a photoelectric cell 74, positioned so that the source 73 will be shielded from the cell 74 when the box 50 is filled to a predetermined level. A light source 75 and a photoelectric cell 76 are similarly disposed with respect to the jogger box 51. The output signals from the cells 74 and 76 are coupled through conventional amplifiers 77 and 78, respectively, to a differential relay 79 operating an armature 80 between terminals 81 and 82, the armature being connected to a valve assembly 87 by a conductor 85. The valve assembly 87 may consist of solenoid operated valves, not shown for simplicity, for controlling the air flow from an air source 88 to the air cylinder 39 through the air lines 70 and 71. Connected between the terminals 81 and 82 and conductors 86 and 84 are power sources 83 and 83a, respectively, shown here as batteries. The relay 79 may be designed so that the armature 81 will not be moved upon simultaneous energization of both relay sections. However, if desirable, the relay may be constructed to operate the air cylinder 39 so that a predetermined jogger box will receive signatures if both are empty.

In describing a typical operation of this embodiment of the invention, it will be assumed that the apparatus is in the operative condition shown in Figure 1, wherein the flow of the signatures 10 is being channeled to the jogger box 50. As soon as the box 50 is loaded to a predetermined level, the stack of signatures interrupts the light beam between the source 73 and the photoelectric cell 74 resulting, consequently, in the armature 80 engaging the terminal 81 and opening the valve to the line 71. The flow of air from the source 88 to the air cylinder 39 will actuate the arm 39a and raise the upper conveyor assembly. In this operation the scoop 15 is guided by the curved member 16, and therefore, not only travels upwardly but also moves in the direction of the flow of the signatures 10, thereby dropping them to the tapes 13. The speed of movement of the scoop 15 in the direction of the flow of signatures should exceed that of the flow to permit this operation. It is to be noted that the remaining signatures on the upper conveyor tapes will proceed into the jogger box 50 thereby rendering the system self-clearing.

While the jogger box 51 is being filled, the signatures may be removed from the jogger box 50 in preparation for another shift in operation of the apparatus. Upon reaching the capacity of the jogger box 51, the relay armature 80 will swing to the terminal 82, in response to deenergization of the photoelectric cell 76, thereby operating the air cylinder 39 by opening the valve in the line 70. The arm 39a will then lower the upper conveyor apparatus and cause the scoop 15 and the guide 17 to travel against the direction of movement of the signatures 10 in a scooping motion, thus diverting the flow of signatures to the tapes 18 and 19 and subsequently to the empty box 50. It should be noted that the lower tapes 13 will also clear themselves with the aid of the tapes 48.

It should be understood that other switching controls

may be substituted for the above-described photoelectric cell circuit. For example, suitable pressure switches may be appropriately disposed to be activated by the boxes 50 and 51 after a predetermined weight of the signatures 10 have been received. These switches may be arranged to energize suitable circuit elements to operate the air cylinder 39 or an equivalent mechanism.

Also, the cylinder 39 may be operated by a timing mechanism so that the boxes 50 and 51 will receive the signatures 10 for time intervals determined by the size of the boxes and signatures, and the rate of flow from the conveyors.

Furthermore, the system may be adapted to feed conveyor buckets instead of jogger boxes, and the buckets may be carried away when loaded by means of a conveyor chain.

This apparatus may also be employed to remove a predetermined number of signatures that must be rejected due to a pasted joint commonly termed a paster. For example, it would be possible to actuate a "memory wheel" each time a paster is made on the reel. Subsequently, the memory wheel will actuate the air cylinder 39 through appropriate control circuits for a suitable time interval to remove the signatures containing the paster as they reach the delivery stage. The number of signatures removed will be determined by the time the conveyor mechanism remains in the alternate operating position.

It will be understood that the above-described embodiment of the invention is illustrative only and modifications thereof will occur to those skilled in the art. Therefore, the invention is not to be limited to the specific apparatus disclosed herein but is to be defined by the appended claims.

I claim:

1. In apparatus for switching an uninterrupted flow of signatures from one conveyor to another angularly related conveyor, the combination of a first conveyor adapted to carry said signatures to a first receptacle, a second conveyor positioned above the first conveyor and adapted to carry said signatures to a second receptacle, a scoop mounted at the entrance of the second conveyor above and adjacent to the first conveyor, guide elements determining a path along which the second conveyor and scoop travel between a signature engaging position and an inoperative position, said path being in the direction of signature flow and away from the first conveyor, and operating means to withdraw the conveyor and scoop along the path at such velocity that the velocity component of the scoop in the direction of signature flow is greater than the velocity of the signature flow, whereby the signatures will drop to the first conveyor, said means also being operative to propel the second conveyor and scoop along the path in a direction opposite to said withdrawal to engage the signatures on the first conveyor and divert them to the second conveyor.

2. Apparatus as defined in claim 1, including means responsive to a predetermined load in one of the receptacles to energize the operating means and divert the flow of signatures to the other of said receptacles.

3. Apparatus as defined in claim 1, wherein said responsive means includes photoelectric means associated with the receptacles.

References Cited in the file of this patent

UNITED STATES PATENTS

2,287,728	Dale	June 23, 1942
2,294,649	Baker	Sept. 1, 1942
2,375,241	Lindgren	May 8, 1945
2,476,371	Haumann	July 19, 1949
2,525,311	Peyrebrune	Oct. 10, 1950
2,540,972	Wagner	Feb. 6, 1951
2,576,956	Matthews	Dec. 4, 1951

FOREIGN PATENTS

562,828	Germany	Nov. 3, 1932
---------	---------	--------------