Nov. 16, 1965 W. W. DAVIDSON, JR., ETAL 3,218,064

CONVEYOR BOARD FOR PRINTING PRESS

Filed Aug. 20, 1962 2 Sheets-Sheet 1

Fig: 1.

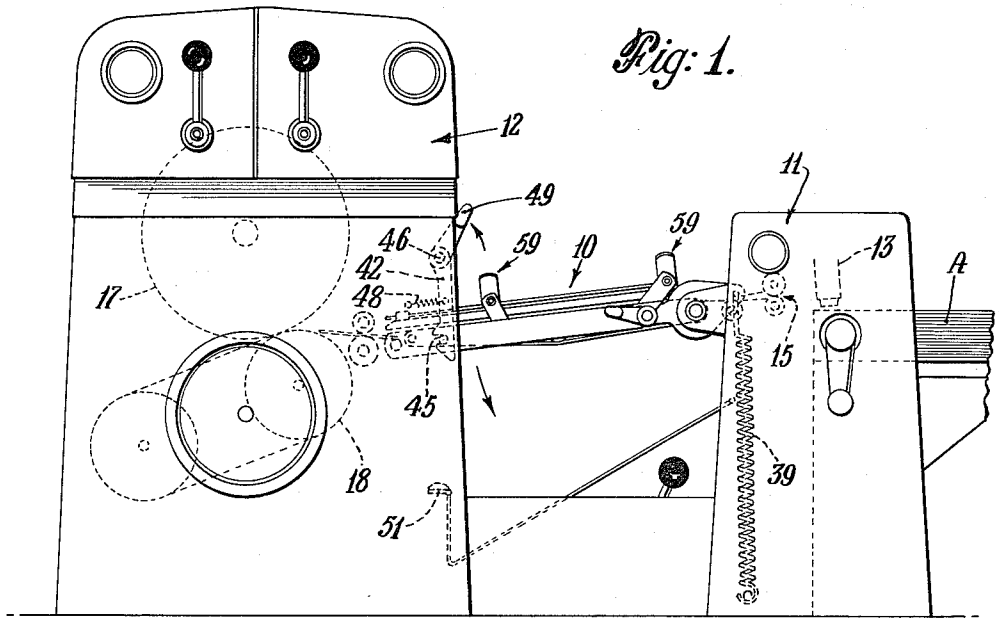
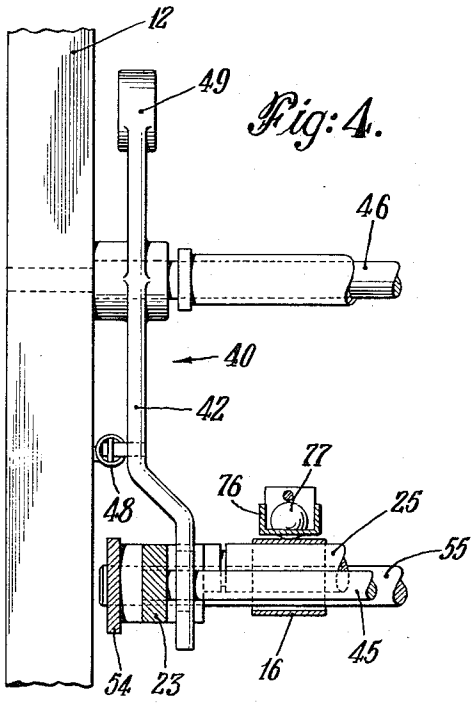


Fig: 4.



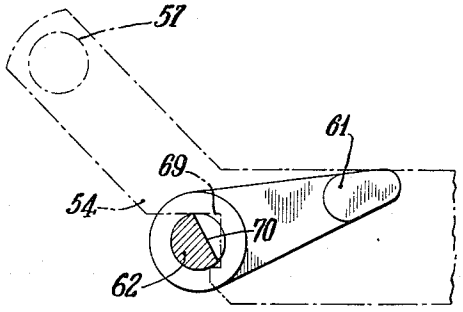


Fig: 5.

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CONVEYOR BOARD FOR PRINTING PRESS

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2 Sheets-Sheet 2

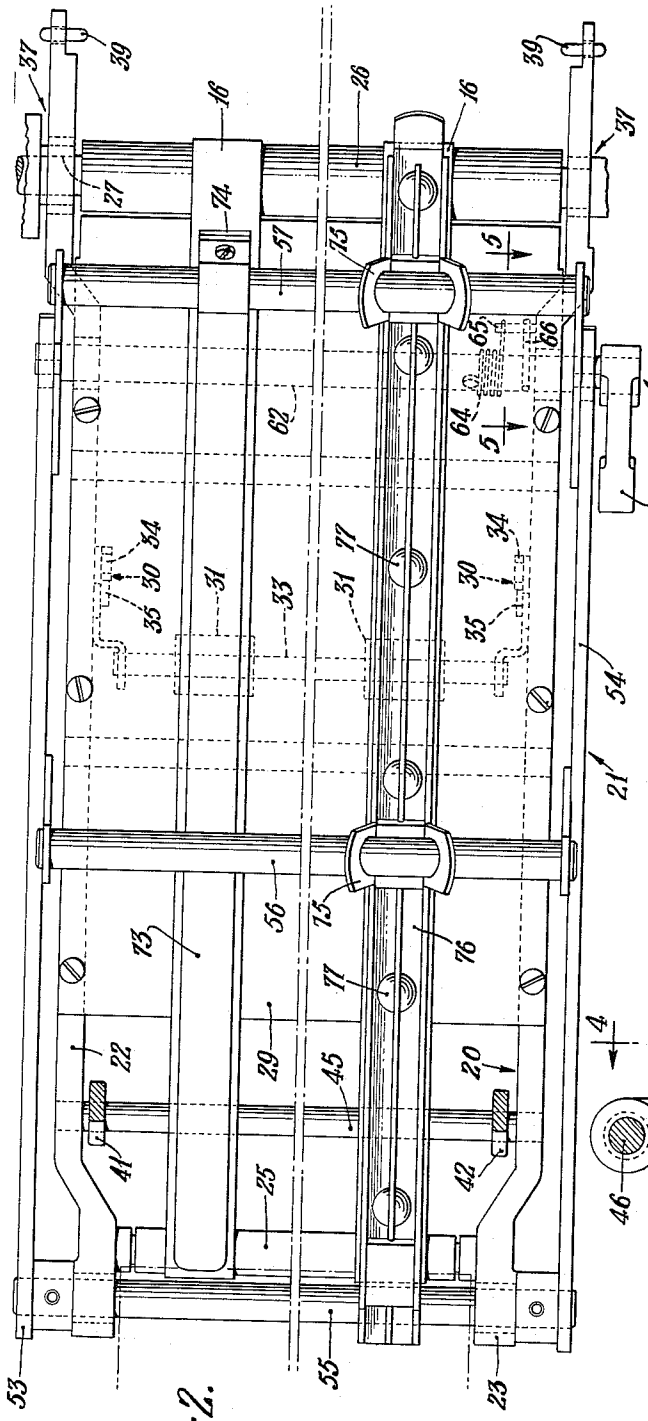


Fig. 2.

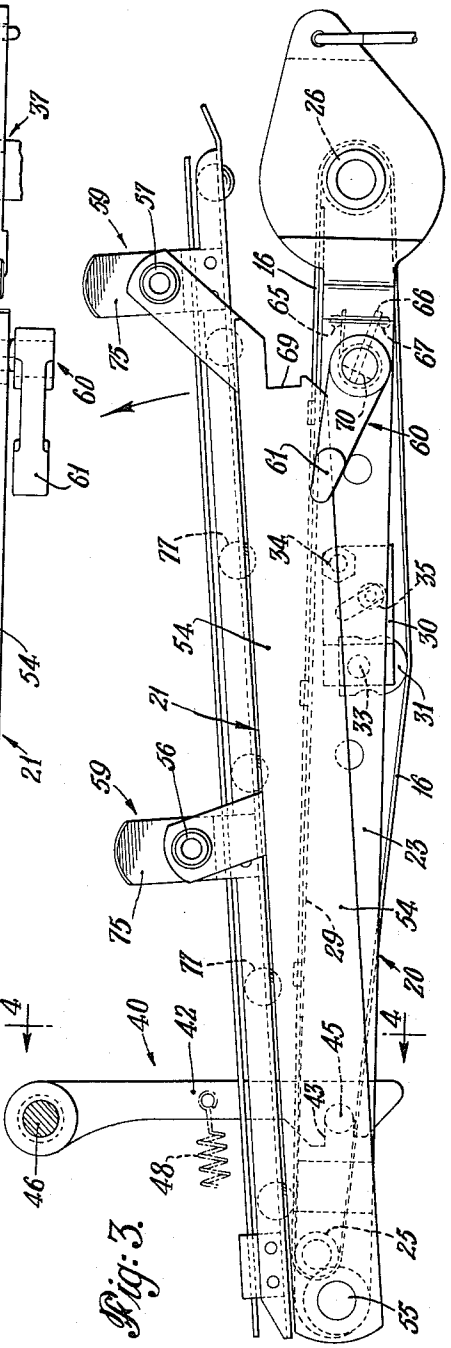


Fig. 3.

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CONVEYOR BOARD FOR PRINTING PRESS

William W. Davidson, Jr., Port Washington, and Leonard Miaskoff, Flushing, N.Y., assignors, by mesne assignments, to Fairchild Camera and Instrument Corporation, a corporation of Delaware

Filed Aug. 20, 1962, Ser. No. 217,840
4 Claims. (Cl. 271—45)

This application is a division of application Ser. No. boards on which sheets are fed one at a time from a sheet feeder to a printing press. More particularly it relates to counter balancing means adapted after the release of the board from its sheet feeding position to retard its free fall as it pivots to a dropped position.

The conveyor board is disposed between a sheet feeder and a printing press and by conveyor belts and cooperating pressure exerting means provides the means of delivery for sheets fed from the feeder to the press. Usually a sheet is fed from a pile of sheets, mounted on an elevator, by means of a sheet feeding mechanism, such as a suction feeder, to a pullout roller assembly that in turn delivers the sheet to the conveyor board where it is translated by the conveyor belts and their cooperating pressure exerting means until stopped by engagement with a series of fingers which project upright into the path of the sheet. While the sheet is held against these stop fingers registration is completed by alignment of the sheet sidewardly by means of a sheet jogger. Thereafter at the proper moment in synchronism with the printing cylinders the stop fingers withdraw from the path of the sheet and the sheet is translated forward to the bite of the printing couple by means of a feed roller mechanism.

The timing of well regulated sheets to the bite of the printing couple and the adjustment and maintenance of the printing cylinders are two of the more important factors in quality high speed production printing. The present invention discloses means whereby a conveyor board can be readily removed from its sheet feeding or operating position so as to facilitate unhindered access to the printing cylinders and their associated mechanisms without disturbing the adjustments of the conveyor board. This is accomplished by pivotably mounting the conveyor board at one end on the sheet feeder's frame and providing a latch mechanism that maintains the conveyor board in its sheet feeding position. Fastened to the conveyor board are counter balancing springs that permit the conveyor to slowly drop to a stop member when the latch member is released. If the conveyor board is frequently released as, for example, when it is used in conjunction with an offset printing press where frequent cleaning of the blanket cylinder is necessary, the retarding action of the counter balancing springs minimizes the possibility of damage to the conveyor.

All sheet registry takes place upon the conveyor board and care must be taken in adjusting the conveyor belts and their associated pressure exerting means. The pressure exerting means act upon the conveyor belts and provide the traction necessary to translate feeding sheets. These means can be embodied in the form of adjustable metal straps which frictionally engage the drive portion of the conveyor belts. When these straps exert too little pressure a sheet may fail to translate to the stop fingers or be improperly aligned there against and if too much pressure is exerted the sheet may be waved or wrinkled. Generally, when thin stock such as onion skin paper is fed, the more important the conveyor board's adjustments become and the more accurately they must be set.

Additionally, provided in the present invention is an assembly upon which the pressure exerting means are

mounted. This assembly is pivotably mounted on a transverse rod of the conveyor board and is normally held by a releasing lever mechanism in a position wherein the pressure exerting means frictionally engage the drive portion of the conveyor belts. When the releasing lever is actuated the assembly can be bodily swung about the transverse rod removing the pressure exerting means from their engaging position. This feature allows an operator to remove jammed sheets or clean the belts and thereafter return the pressure exerting means to an engaging position with the conveyor belts without having disturbed the pressure adjustment.

Features and advantages of this invention may be gained from the foregoing and from the description of a preferred embodiment thereof which follows:

In the drawings:

FIG. 1 is a schematic side elevational view of the conveyor board embodying the present invention shown disposed between a sheet feeder and a printing press;

FIG. 2 is a top plan view of the conveyor board;

FIG. 3 is an enlarged side elevational view of the conveyor board showing the upper assembly in a slightly raised position;

FIG. 4 is a sectional view of the latch mechanism taken along line 4—4 of FIG. 3; and

FIG. 5 is a sectional view of the releasing lever mechanism taken along line 5—5 of FIG. 2.

In the drawings there is shown a conveyor board **10** embodying the present invention. For illustrative purposes it is shown disposed between a suction-type sheet feeder **11** and a printing press **12**. A suction foot **13** periodically feeds the top sheet from a pile of sheets A to a pullout roller assembly **15**. After delivery to the pullout roller assembly, the sheet is translated thereby to conveyor board **10** where conveyor belts **16** carry the sheet to registry means (not shown). These means are usually embodied in the form of stop fingers and a sheet jogger. After registration, the feed rollers of press **112** then advance the sheet to the bite of the printing couple, composed of cylinders **17** and **18**.

Conveyor board **10** is composed of two assemblies, a lower main assembly **20** and an upper assembly **21** pivotally mounted on the lower assembly. The lower assembly is provided with two side frames **22** and **23**, which are rigidly connected by a series of transverse rods. Rotatably mounted in these side frames are rollers **25** and **26**. A suitable number of endless belts are trained over these rollers and provide the means for delivering a sheet from the feeder to the printing press. The rollers can be made of an appropriate light weight material and, as shown, their space relationship is such that they are parallel to each other and respectively perpendicular to the conveyor's side frames. This relationship can be varied if desired. Roller **26** secured to shaft **27** is continuously driven thereby and supplies the power necessary to drive the conveyor belts. Shaft **27** is driven by any available source of power at a speed to insure delivery of a sheet to the stop fingers each time the fingers rise to a sheet arresting position. The conveyor belts rest upon a plate **29**, fastened to side frames **22** and **23** by machine screws; their spacing can be varied to best feed sheet stock of different types and sizes. With most sheet stock they are spaced approximately equidistant in order to provide a balanced driving force to the sheets. The operating tension of the belts is applied by means of a belt tensioning device **30** and is determined in accordance with practices well known in the art. This device consists of pulleys **31** mounted on a rod **33**, pivotally mounted on side frames **22** and **23** at **34** to bear against the endless belts and place them under tension. By raising and lowering rod **33** the operating tension can be adjusted. This is accom-

plished by loosening a position securing bolt 35 threaded into side frame 23 and changing the position of rod 33 thereafter the bolt is tightened securing rod 33 in a fixed new position and the belts under the desired operating tension.

In order to provide for unhindered access to the printing cylinders, the conveyor board 10 is pivotably mounted on the side walls of the sheet feeder at 37. The mounted ends of the side frames 22 and 23 are forked shaped and each has a counter balancing spring 39 attached thereto. These springs are fastened to their corresponding side walls of the sheet feeder at 11 and supply a continuous force on the conveyor that tends to rotate it clockwise towards its sheet feeding position. The conveyor board is held in its operating position by a latch mechanism 40, mounted on the frame of printing press 12. Mechanism 40 is provided with two catch members 41 and 42 each of which is formed with a detent portion 43, so disposed as to latch a transverse rod 45 of lower assembly 20. These catch members are keyed to a shaft 46, rotatably mounted in the side frames of the printing press and are urged counterclockwise by the resilient action of a spring 48 fastened to catch 42 and the left frame of the printing press. When it is desired to release the conveyor board, a handle 49 integral with catch member 42 is rotated in a counterclockwise direction against the urging of spring 48 until the detents 43 release from engagement with rod 45. Thereafter the weight of the conveyor board is sufficient to overcome the counter balancing force exerted by springs 39 and cause the board to slowly drop to a rubber stop member 51 fastened to the frame of the printing press. Conveyor board 10 is readily returned to its sheet feeding position by exerting a clockwise force thereon that when coupled with the force exerted by springs 39 is sufficient to snap mechanism 40 into latching engagement with transverse rod 45.

The upper assembly 21 consists of two side supports 53 and 54 pivotally mounted on a transverse rod 55 of the lower assembly. The side supports are rigidly connected by two support bars 56 and 57 which in turn carry pressure exerting means 59. Normally, assembly 21 is held in a position wherein the pressure exerting means frictionally engage the conveyor belts by a releasing lever mechanism 60. However, when releasing lever 61 is actuated it allows the upper assembly to be bodily swung counter-clockwise about transverse rod 55. In doing this, pressure exerting means 59 are removed from contact with conveyor belts 16, permitting adjustment of the belts or removal of a jammed sheet. Lever 61 is secured to shaft 62 rotatably mounted in side frames 22 and 23. Coil spring 64 mounted on shaft 62 resiliently urges shaft 62 in a clockwise manner and it is this action that causes the releasing lever mechanism to hold the upper assembly in its engaging position, as will be seen hereafter. Coil spring 64 is fixed at one end to shaft 62 and at its other is in engagement with a pin 65 secured in side frame 23. Clockwise rotation of shaft 62 caused by coil spring 64 is arrested by engagement of a rod 66, press fit in shaft 62 and a stop member 67 secured in side frame 23. In this position, as seen in FIG. 5, the upper assembly is held in its engaging position by two detents 69, formed on assembly 21, each of which is disposed so as to grasp shaft 62. Shaft 62 is provided with two relieved sections 70 which cooperate with their corresponding detent 69 when lever 61 is rotated counter-clockwise. In this released position sections 70 are in a relationship with detents 69 so as to allow assembly 21 to be pivotally lifted about transverse rod 55. This action facilitates removal of jammed sheets or adjustments on the conveyor belts. To return assemby 21 to its operating position it is merey necessary to snap detents 69 back into engagement with shaft 62.

The pressure exerting means play an important role in sheet feeding and especially in high speed feeding operations where differences in the forces exerted by either the conveyor belts or the pressure exerting means may twist a sheet and cause misalignment. Therefore careful adjustment of the pressure exerting means is necessary. In FIG. 2, two types of pressure exerting means are depicted. First, a strap 73 secured to bar 57 by clip device 74. Strap 73 frictionally engages its corresponding conveyor belt 16. By rotating strap 73 on bar 57 adjustment of the pressure exerted by the strap is accomplished. Secondly, a channel member 76 secured to bars 56 and 57, by means of two spring clips 75 is formed with holes that are adapted to carry traction balls 77. These balls are usually made of a light weight material and ride atop the conveyor belt without exerting appreciable drag on feeding sheets. By employing balls of different materials (weights) the pressure caused thereby may be varied.

Various attachments can be mounted in association with support bars 56 and 57. For example, a guide finger that directs sheets with upcurled lead edges into the conveyor board can be mounted on bar 57 or a brush member could be positioned on bar 56 so that the ends of the bristle of the brush rest against the following of a fed sheet when the lead edge thereof is in contact with the stop fingers. A brush in this position would prevent sheets from bouncing backwardly away from the stop fingers after contacting same.

It is to be understood that many changes can be made in the disclosed embodiment without departing from the spirit and scope of the invention and, therefore, the description and drawings are to be interpreted in an illustrative rather than a limiting sense.

What is claimed is:

1. Apparatus for feeding individual sheets one at a time from a sheet feeder to a printing press, said apparatus comprising a conveyor board pivotally mounted at one end on the sheet feeder for movement between a sheet feeding and a released position, said conveyor board having a belt which is continuously driven to carry sheets from the sheet feeder to the printing press, latching means pivotally mounted on the printing press for locking said conveyor board in a sheet feeding position, a sheet hold down assembly including pressure exerting means for urging sheets into frictional engagement with said conveyor belt, one end of said assembly being pivotally mounted on the printing press end of said conveyor board so that its free end can be swung away from the conveyor board to give access to jammed sheets, and securing means mounted on said conveyor board for locking the free end of said sheet hold down assembly in its operative sheet feeding position, said securing means including a locking member pivotally mounted on said conveyor board, spring means for urging said member to a locking position, and lever means for rotating said locking member against the action of said spring means to a releasing position.

2. Apparatus according to claim 1 wherein said sheet hold down assembly includes a pair of spaced apart side supports each of which is provided with a detent and said locking member is a shaft-like member that engages with said detents to secure said hold down assembly in operative relationship with the conveyor board and which is formed to clear the detents when the locking member is rotated by the lever means whereby the sheet hold down assembly can be manually pivoted away from the conveyor board to give access to jammed sheets.

3. Apparatus according to claim 2, wherein said conveyor board includes a pair of spaced apart side frames that extend beyond the pivot mounting on the sheet feeder and including spring means connected between the extensions of said side frames and the sheet feeder to bias the conveyor board to its sheet feeding position.

4. Apparatus according to claim 3 including a resilient stop member to arrest said conveyor board in a limiting position when it is released from its sheet feeding position.

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