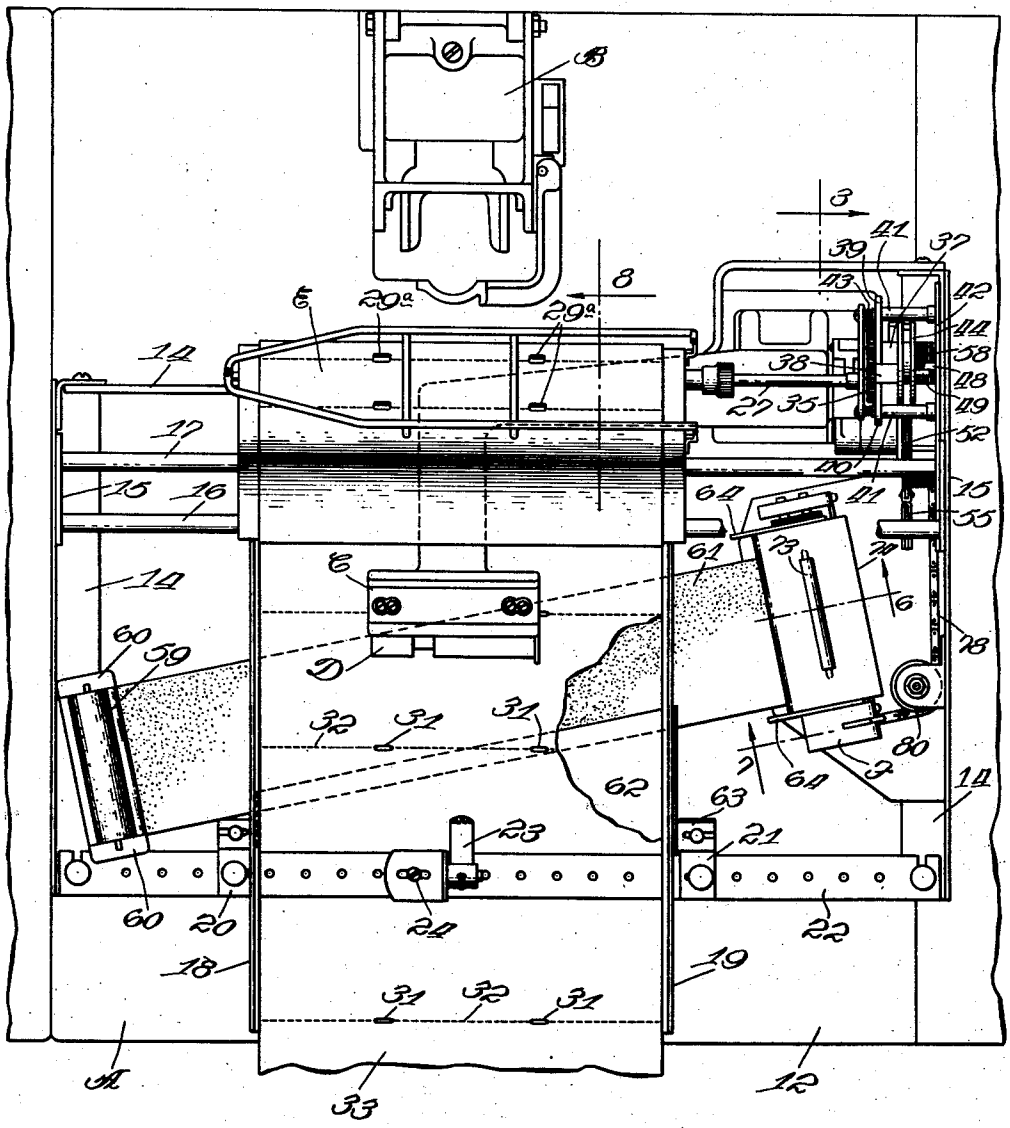
Aug. 8, 1939. J. E. SCHAEFER 2,168,364

FEED MECHANISM FOR DUPLICATING MACHINES

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Fig. 1.



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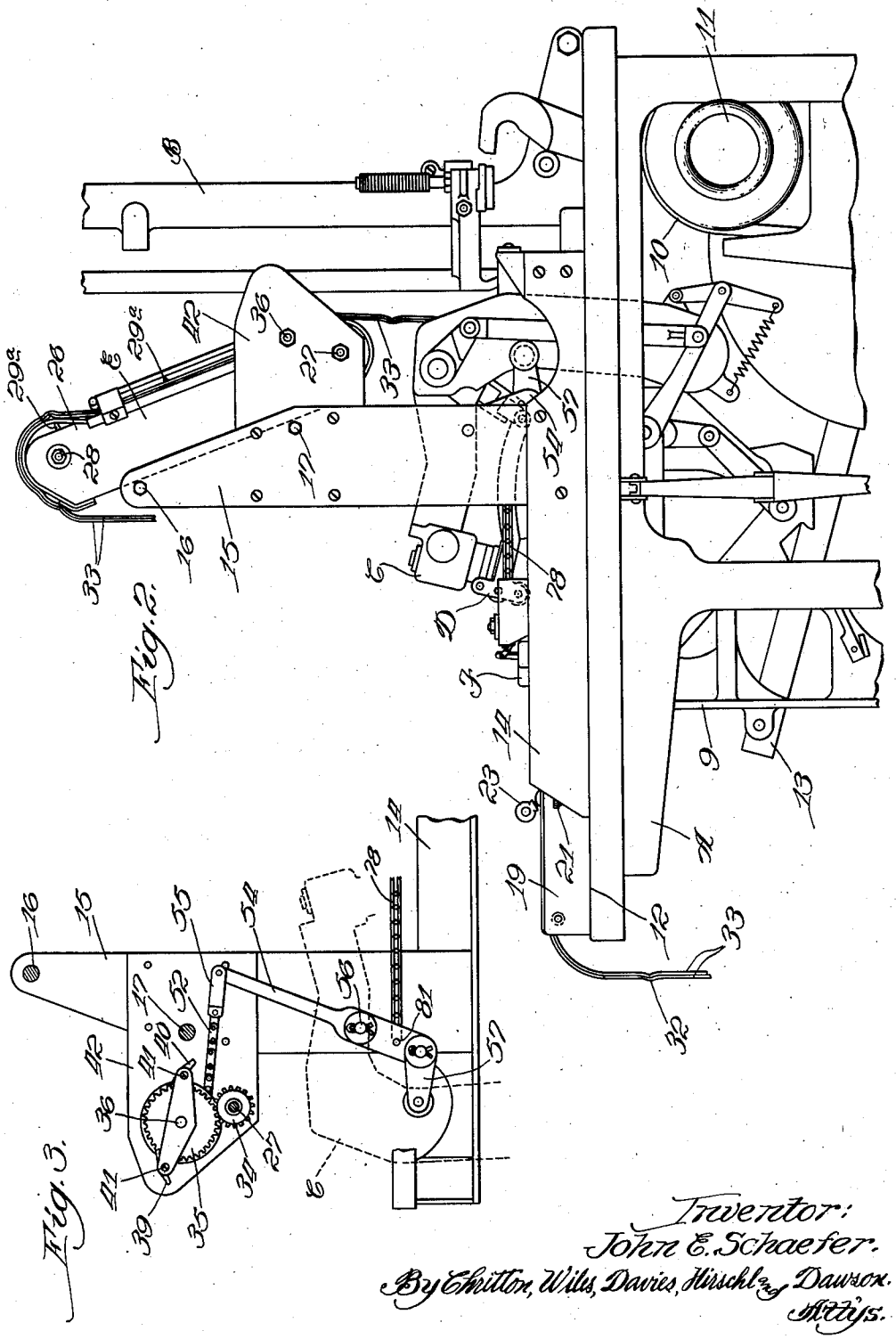


Fig. 2.

Fig. 3.

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Fig. 4.

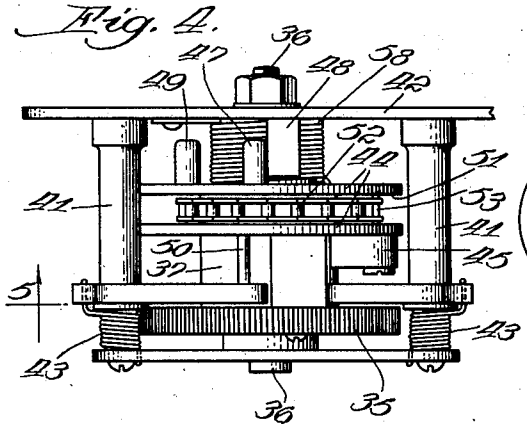


Fig. 5.

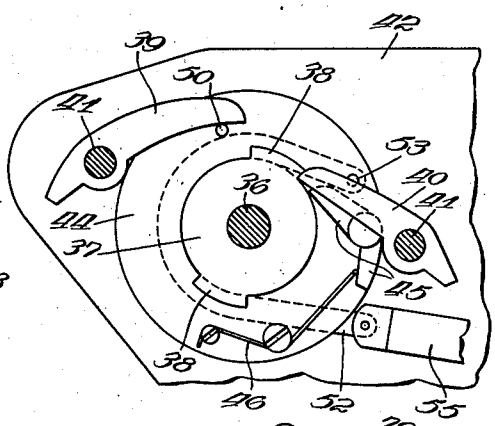


Fig. 6.

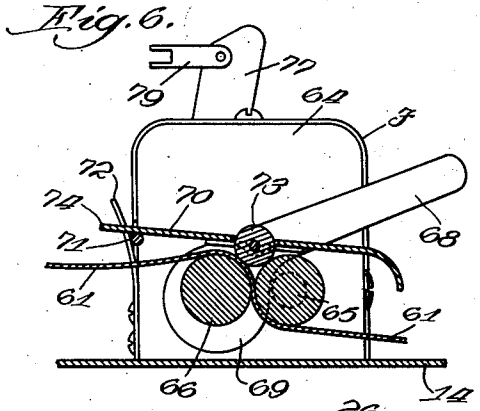


Fig. 7.

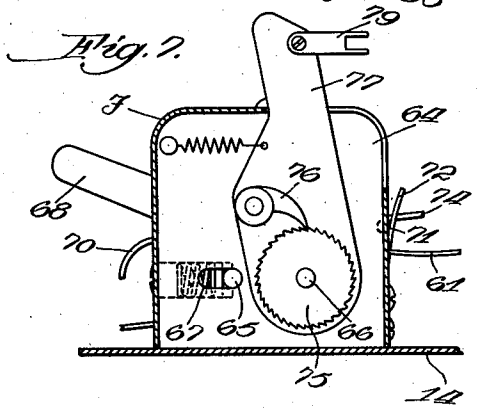
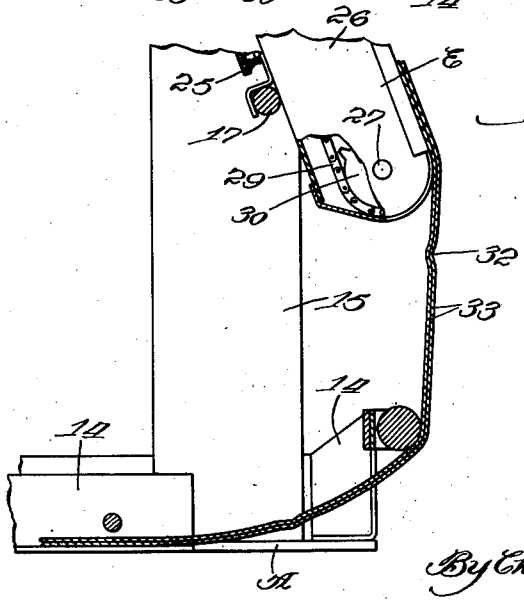


Fig. 8.



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Patented Aug. 8, 1939 2,168,364

UNITED STATES PATENT OFFICE

2,168,364

FEED MECHANISM FOR DUPLICATING MACHINES

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Application December 27, 1937, Serial No. 181,860

11 Claims. (Cl. 101—57)

This invention relates to feed mechanisms for duplicating machines, such as "addressograph" machines, or the like, and more particularly to mechanisms for advancing continuous-form stationery through said machines and advancing a duplicating strip through said stationery in timed relation to the operation of the machine.

The primary object of the invention is to provide a feed mechanism for automatically advancing successive lengths of continuous-form perforated stationery strips in alignment through impression receiving position and to provide means for automatically advancing a duplicating strip.

A further object of the invention is to arrange the transfer strip feed mechanism so that clear impressions will be made during each operation without excessive waste of carbon or other transfer medium.

The invention is illustrated in a preferred embodiment in the accompanying drawings, in which:

Figure 1 is a broken plan view of a standard "addressograph" machine equipped with an attachment embodying the present invention; Fig. 2, a broken side elevational view of the same; Fig. 3, a fragmentary sectional view, taken as indicated at line 3 of Fig. 1; Fig. 4, an enlarged fragmentary view of the ratchet mechanism for advancing the stationery step-by-step; Fig. 5, a fragmentary sectional view, taken as indicated at line 5 of Fig. 4; Fig. 6, a broken sectional view showing the presser rollers for advancing the transfer strip, taken as indicated at line 6 of Fig. 1; Fig. 7, a fragmentary sectional view, taken as indicated at line 7 of Fig. 1; and Fig. 8, a fragmentary sectional view of the stationery feed mechanism, taken as indicated at line 8 of Fig. 1.

In the embodiment illustrated, A designates the main frame of an "addressograph" machine; B, a vertical chute or magazine for holding a series of printing plates; C, a presser arm adapted to press stationery firmly into engagement with an underlying printing plate; D, platen rolls adapted to be reciprocated across the top of the stationery while the latter is in engagement with a printing plate; E, mechanism for drawing strips of continuous-form stationery over the main frame through impression receiving position; and F, transfer strip feed mechanism.

"Addressograph" machines have been on the market for many years and are well-known. No invention is claimed in the machine per se. As is well-known in the art, the machine is equipped with a reciprocating slide mechanism 9 which is operated through suitable linkages and a belt 10 from a motor 11. The mechanism has a reciprocating conveyer for moving printing plates seriatim from the magazine B, beneath the table 12 of the main frame to impression receiving position beneath the presser arm C and thereafter move them into a receiving tray 13. It may be noted, however, that the arm C is pivotally mounted beneath the table 12 and rocks downwardly and upwardly during each operation to make an impression on the underlying strip. The various feed mechanisms of the present invention are driven directly from the presser arm during its oscillations, as will be explained below.

A detachable mounting frame carries the mechanisms of the present invention and comprises a base frame 14 which is adapted to be secured to the table 12 of the main frame of the machine and supports rigid upwardly extending standards 15 which are connected by cross-bars 16 and 17. As will be seen in Fig. 1, a pair of stationary guide members 18 and 19 are adjustably secured at 20 and 21 to a flat cross-bar 22. Also, a leaf spring presser member 23 is adjustably secured to the cross-bar 22, as indicated at 24, and is adapted to apply a small amount of friction to stationery drawn thereunder.

The feed mechanism E, which is adjustably secured to the rods 16 and 17 by thumb screws 25, is similar to the Louis Jensen feed mechanism for a tabulating machine, shown in a copending application. The device comprises a box-like frame 26 in which is journalled a pair of sprocket wheel shafts 27 and 28. A pair of endless belt conveyers 29 are mounted on sprocket wheels 30 and are provided with register pins 29a which are adapted to engage register perforations 31 provided along the lines of weakening 32 which separate the continuous-form stationery 33 into form lengths. It will be understood that the mechanism E, driven by the shaft 27, must advance the stationery one form length beneath the presser arm C during each operation of the machine.

The sprocket wheel shaft 27, as shown in Fig. 3, is provided with a gear 34 which is in mesh with a gear 35 journalled on a jack shaft 36. As best shown in Fig. 5, the gear 35 has a hub portion 37 provided with a pair of diametrically opposed teeth 38 which are adapted to be engaged by a stop pawl 39 or a locking pawl 40. The pawls are journalled on spacing bars 41 which secure the mechanism to a supporting arm 42 mounted on one of the standards 15. The pawls are provided with torsion springs 43 which urge the pawls into engagement with the gear hub.

A driving ring 44 is journalled on the jack shaft

36 and is provided with a pivotally mounted pawl 45 which is urged into engagement with the gear hub 37 by means of a small spring 46 so that when the ring is oscillated, it will engage one of the teeth 38 and drive the gear 35 and its hub 37 counter-clockwise, as viewed in Fig. 5. The ring is provided with an outwardly extending finger 47 which limits its rearward oscillation by engagement with a stop 48 provided on the supporting arm 42. Its forward oscillation is limited by a second outwardly extending finger 49 which is adapted to engage the opposite side of the stop 48. The opposite side of the ring is provided with an inwardly extending finger 50 which, as shown in Fig. 5, is adapted, during its return stroke, to raise the stop pawl 39 from engagement with the tooth 38. However, when the ring is rotated counter-clockwise, as viewed in Fig. 5, after the pawl 39 has cleared the nearest tooth 38, it will be permitted to drop down and engage the front face of the opposite tooth when its completes its 180° of travel. At this point, the locking pawl 40 will drop behind the opposite or rear edge of the tooth and lock the gear and feed mechanism E against moving rearwardly.

The ring E has a deep annular groove 51 which receives an operating chain 52 which has one end secured to the ring, as indicated at 53, and the other end connected to a rock arm 54, as indicated at 55. The rock arm 54 is pivotally mounted on one of the standards 15, as indicated at 56 and its lower end portion is connected to the presser arm C by means of a pitman 57. As best shown in Fig. 4, a strong torsion spring 58 is provided on the shaft 36 to urge the driving ring 44 back into its starting position shown in Fig. 5.

An important feature of the present invention is the mechanism for feeding a transfer strip between the continuous-form stationery strips 33 so that a duplicate record may be made simultaneously and it will not be necessary to provide carbon or transfer strips which are co-extensive with the stationery strips 33.

It is preferred to arrange the carbon feed mechanism oblique to the path of the travel of the stationery. The reason for this is to use more of the cross area of the transfer strip and make the wear substantially uniform in its travel across the printing plate. As will be readily understood, if the carbon is advanced step-by-step across the printing plate in the line of its inscription, the fresh carbon will make a good print at one edge portion and will be exhausted and caused to make a poor impression at the opposite edge. By feeding a carbon strip obliquely practical tests show that although the carbon is only advanced about one-sixteenth of an inch during each operation, a uniformly good impression is made throughout the length of the legend on the printing plate.

As shown in Fig. 1, a roll of transfer material 59 is supported on brackets 60 near one side of the frame 14 and a transfer strip 61 extends laterally between the strips 33 to the transfer strip feed mechanism F. A biased fabric guard 62 is folded over an anchoring bar 63 and secured thereto so as to have two fabric flaps extending rearwardly in the direction of travel, between the strips 33 to a position slightly overlapping both sides of the marginal front edge portion of the transfer strip 61. The rear edge of the flaps of the guard are cut on a bias so as to be substantially parallel to the front edge of the transfer strip. The guard protects the carbon strip from being torn by ragged edges sometimes found at the line of weakening and register perforations of the advancing stationery. It also separates the continuous-form strips slightly and reduces a tendency of the strips to be pulled out of alignment by friction.

The transfer strip mechanism F has a pair of small upwardly extending standards 64 in which are journalled presser rolls 65 and 66. As shown in Fig. 7, the roll 65 is yieldingly urged inwardly by a compression spring 67 so as to apply yielding pressure between the presser rolls. A finger lever 68 is journalled on the shaft 66 and has a cam face 69 adapted to engage the shaft 65 and separate the rolls to facilitate threading the front end of the transfer strip into the bite of the rolls. A cover member 70 is pivotally mounted on the outer edge portions of the standard 64, as indicated at 71. A leaf spring 72 yieldingly holds the parts together. The cover is provided with an idler roller 73 which is pressed down lightly against the journalled presser roll 66 and serves to direct the end of the transfer strip 61 out of the feed device. The rear end of the cover member forms a tear-off edge 74 upon which the worn out transfer strip may be severed by drawing upwardly, in the well-known manner. As shown in Fig. 7, the shaft 66 is provided with a toothed wheel 75 which is adapted to be engaged by a pawl 76 carried by an operating lever 77 having its lower end journalled on the shaft 66. A chain 78 is secured to the upper end of the lever 77 by connection 79 and passes around a pulley 80 which is journalled on the frame 14. The other end of the chain 78 is secured to the lower end of the rock arm 54, as indicated at 81. Thus, it will be understood that during each operation of the presser arm C of the "addressograph" machine, the stationery strips will be advanced one form length by the feed mechanism E and the carbon strip will be advanced a short distance by the mechanism F.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. In combination: a frame having a table and mechanism for feeding printing plates seriatim into printing position thereon; feed means for aligning and advancing continuous-form stationery strips over said table into impression receiving position above the printing plate in printing position; additional feed means for moving transfer material obliquely between said strips over said plate; presser mechanism for pressing said stationery against said plate; and driving means for actuating said mechanisms and feed means intermittently in timed relation.

2. A device as specified in claim 1, in which the strip feed means comprises belts provided with register pins adapted to engage register perforations provided in each form-length of stationery, said belts being of sufficient length to engage at least two form-lengths at all times simultaneously.

3. A device as specified in claim 1, in which the feed means comprises a belt equipped with register pins adapted to engage register perforations provided in each form-length of stationery, and a locking device is provided to lock said belt against movement while the presser mechanism is in engagement with the stationery.

4. A device as specified in claim 1, in which the feed means comprises belts equipped with

register pins adapted to engage register perforations provided in each form-length of stationery, and ratchet and locking means are provided adapted to rotate said belts in but one direction and lock said wheel while the presser mechanism is in engagement with the stationery.

5. In combination: a printing machine having a table with an opening therein to which printing plates may be fed seriatim; presser mechanism over said opening adapted to press stationery strips into printing engagement with a printing plate positioned in said opening; a stationery feed device disposed above said presser mechanism adapted to draw continuous-form stationery over impression receiving position; and carbon strip feed mechanism adapted to advance carbon strips laterally between said strips intermittently in timed relation to the movement of said printing plates.

6. In combination with a printing machine adapted to impress automatically a different legend at each operation upon successive lengths of stationery strips fed therethrough: feed mechanism for advancing said stationery; and additional feed mechanism for advancing a transfer strip between said stationery strips, the path of the transfer strip being obliquely disposed to the path of the stationery.

7. Mechanism as specified in claim 6, in which the feed mechanism for the transfer strip comprises a pair of presser rolls, and a ratchet mechanism for driving said rolls in timed relation to the movement of the stationery feed mechanism.

8. Mechanism as specified in claim 6, in which the feed mechanism for the transfer strip comprises a pair of presser rolls, cam means for separating said rolls to permit insertion of the strip, a cover for the rolls provided with a tear-off edge, and an idler roll depending from said cover between said rolls.

9. In combination with a printing machine adapted to impress automatically a different legend at each operation upon successive lengths of stationery strips fed therethrough: feed mechanism for advancing said stationery; and additional feed mechanism for advancing a transfer strip between said stationery strips, and obliquely thereto.

10. A device as specified in claim 9, including apron-guards anchored between the stationery strips and extending rearwardly to guard the front marginal edge of the transfer strip from the advancing stationery.

11. In combination with a printing machine adapted to impress automatically a different legend at each operation upon successive lengths of stationery strips fed therethrough: feed mechanism for advancing said stationery comprising belts having outwardly extending register pins, and means for driving said belts comprising a drive shaft, a ratchet wheel geared to said shaft, a ring axially journalled with said wheel and having an oscillatable pawl in engagement with said wheel, a chain having one end secured to said ring and extending partially therearound, and a rock arm driven by the printing machine and connected to the other end of said chain.

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