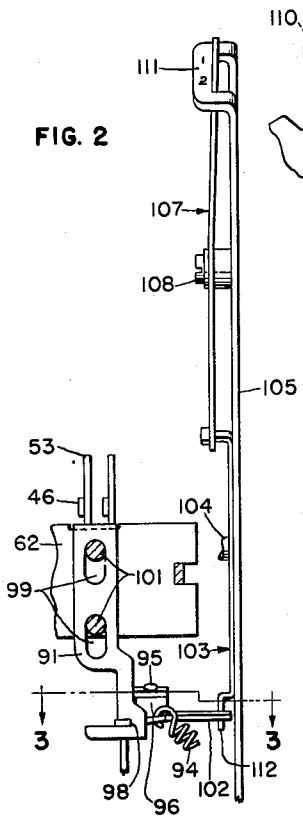
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LINE FEED MECHANISM

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FIG. 2



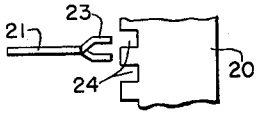


FIG. 4

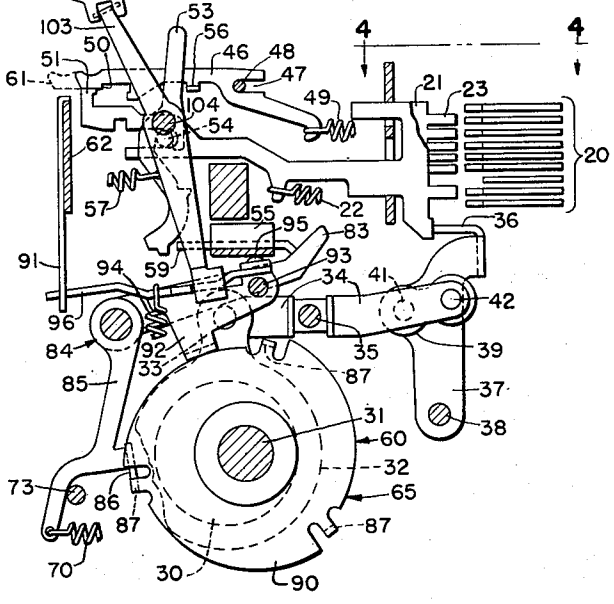


FIG. 1

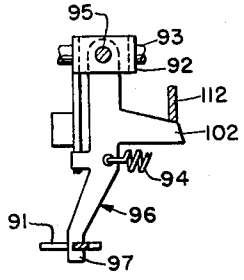


FIG. 3

INVENTOR
BERTHEL F. MADSEN
BY Emery Robinson
ATTORNEY

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FIG. 5

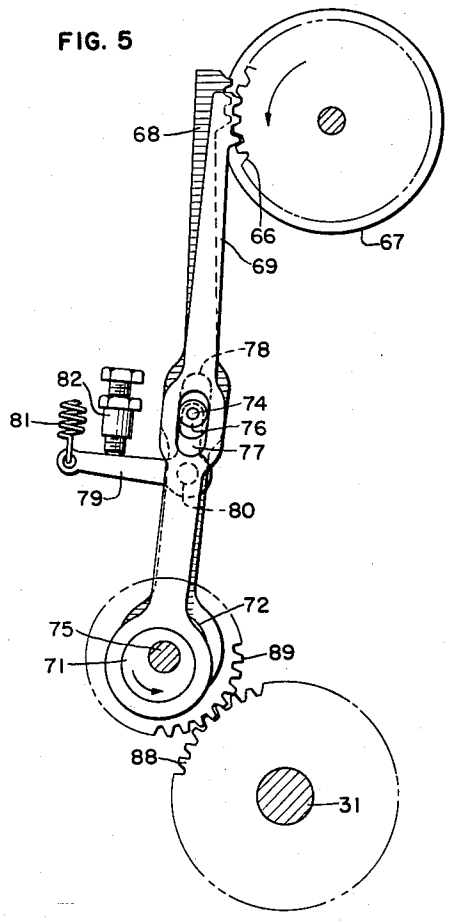
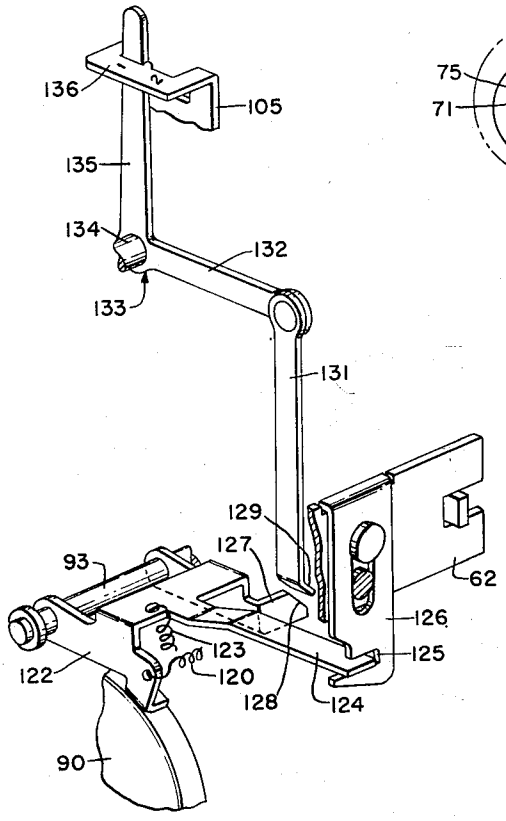


FIG. 6



INVENTOR
BERTHEL F. MADSEN
BY Emery Robinson
ATTORNEY

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2,701,823

LINE FEED MECHANISM

Berthel F. Madsen, Chicago, Ill., assignor to Teletype Corporation, Chicago, Ill., a corporation of Delaware

Application November 16, 1953, Serial No. 392,169

4 Claims. (Cl. 178—25)

This invention relates to printing telegraph apparatus and more particularly to improvements in function controlling mechanisms therefor.

The present invention concerns specifically the effectuation of single and double line feed functions in a printer substantially of the type shown in United States Patent No. 2,505,729, issued April 25, 1950 to W. J. Zenner.

The invention features in a page printer having a movable type carriage and a rotatable platen, a single and double line feed mechanism wherein the line feeding movement is governed by a clutch individual thereto, and in which the single and double line feeds are each controlled from the same clutch by different mechanical linkages, whereby single line feed is obtained pursuant to a first predetermined degree of rotation of the clutch, and a double line feed is obtained pursuant to a second predetermined degree of rotation of the line feed clutch, without altering the condition of the function lever stripper bail.

The primary object of the invention is to provide in a page printer an improved single and double line feed mechanism comprising interconnecting linkage which is conducive to the provision of readily demountable subassemblies.

The foregoing and other objects of the invention will be more apparent in the following detailed description of the invention when taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a transverse cross sectional view of the selective control unit taken substantially at the location of the line feed function lever;

Fig. 2 is a fragmental rear view of the selective control unit showing the single and double line feed arrangement;

Fig. 3 is a cross sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1;

Fig. 5 is an elevation view of the line feed mechanism, and

Fig. 6 is a perspective representation of a modified form of the invention.

Having reference to Fig. 1, there is shown the basic function mechanism with which the line feed mechanism according to the present invention is associated. This basic function mechanism is located in the receiving page printers at all outlying stations. For a more thorough description of the printer with which the basic function mechanism shown in Fig. 1 is designed to be used, reference should be had to said United States Patent No. 2,505,729, the disclosure of which is incorporated herein by reference.

A set of code bars, indicated generally by the numeral 20, is suitably mounted within the printer, which code bars are comparable to code bars 62 to 70 of said Patent No. 2,505,729. Certain of said code bars 20 are movable longitudinally to one of two positions in accordance with the marking and spacing impulses of the well known Baudot code. A plurality of function bars 21 are suitably mounted in the apparatus with respect to the code bars 20, and are urged to the right (as viewed in Fig. 1) towards the code bars 20 by means of springs 22 individual to each function bar. Each function bar 21 has a plurality of code projections 23 (Fig. 4) which cooperate with code notches 24 in each of the code bars 20, in well known manner.

A power shaft 31 carries thereon an eccentric cam 30. A collar 32 is mounted rotatably on the eccentric 30 and has an arm 33 by which the cam 30 is attached pivotally to a lever 34 supported pivotally on a shaft 35. A bail 36 (Fig. 1) has a pair of arms 37 which are mounted pivotally on a stationary shaft 38. A pair of toggle links 39 are secured pivotally at 41 to the arm 37, and are secured at the other ends thereof to pivots 42 to which the lever 34 is also secured. As the shaft 31 rotates, the lever 34 is oscillated about the shaft 35 to thereby, through the toggle links 39, oscillate the bail 36.

A function pawl 46 has an elongated slot 47 by means of which said function pawl 46 is mounted for longitudinal movement on a shaft 48. A spring 49 continuously urges the function pawl 46 to the right (Fig. 1) and counterclockwise about the shaft 48. The function pawl 46 has a latching shoulder 50 which cooperates with a shoulder 51 on the function bar 21. Normally the latch 50 rides on the top of the shoulder 51 (as illustrated in Fig. 1) thereby permitting the spring 49 to retain the function pawl 46 in its rightward position. A function operating lever 53 is mounted pivotally on a shaft 54 and cooperates with a laterally directed portion 56 on the function pawl 46. The function operating lever 53 is biased in a clockwise direction by a spring 57. Associated with the lower end of the function operating lever 53 is an interponent member 59 the purpose of which will be described hereinafter. Interponents 59 are slidably carried in a guide bracket 55.

Assuming that a permutation of positions of the code bars 20 has been set up which corresponds to the function bar 21, the bail 36 moves to the right and all of the projections 23 are opposite notches 24. The spring 22 is thereby permitted to move the function bar 21 to the right, the projections 23 entering the notches 24, and the shoulder 51 underriding the latching shoulder 50 to thereby engage said latching shoulder 50 due to the action of spring 49 upon function pawl 46. Thereafter as the bail 36 moves back to the left during its return stroke it moves the function bar 21 also, the function bar 21 in turn moving the function pawl 46 to the left. As the function pawl 46 moves to the left in this manner, the lateral projection 56 thereon engages and pivots the function operating lever 53 counterclockwise against the action of spring 57 to cause the interponent 59 to be thrust rightwardly (as viewed in Fig. 1).

During the above-mentioned selective operation of function bar 21, the function pawl 46 was shifted from its solid line position to the dotted line position 61 over a vertically reciprocating bail member 62. Thereafter, as a new selection is being made in the code bars 20, the bail 62 moves upwardly to strip or disengage the function pawl 46 from latching engagement with their corresponding function bars 21. Stripper bail 62 is reciprocated vertically by suitable camming instrumentalities associated with the shaft 31.

Having reference to Fig. 5, the line feed mechanism contemplated herein is of the type disclosed in copending application, Serial No. 210,910 filed February 2, 1951, now U. S. Patent No. 2,667,256 dated Jan. 26, 1954 by B. F. Madsen, and comprises a gear 66 fixedly related to the platen 67 of the printer, and a pair of drive or rack members 68 and 69. The gear 66 rotates with the platen 67 and the rack members 68 and 69 are adapted to be alternately engageable with the teeth on the gear 66, with a slight overlap of engageability being provided, so as to impart rotative motion to the gear 66 and platen 67. The rack members 68 and 69 are connected to eccentrics 71 and 72, respectively, which are operatively related to the line feed clutch 65 (Fig. 1) hereinafter described. Power for operating said racks 68 and 69 is derived from the main shaft 31 through said clutch 65. The eccentrics thus control the reciprocatory motion of the rack members 68 and 69. As shown in Fig. 5, the rack members 68 and 69 are adapted to be rocked on a movable pivot 74 comprising a roller 76 cooperable with slots 77 and 78 in said rack members 68 and 69. The pivot roller 76 is carried on the vertical arm of a bell crank lever 79 pivotally mounted on a pivot stud 80 fixed to the side frame of the apparatus. The bell crank 79 is normally biased

clockwise about pivot 80 by a spring 81 against an adjustable stop 82.

Upon rotation of the eccentrics 71 and 72, a combination of rocking motion about pivot 74 and vertically reciprocating motion is imparted to the rack members 68 and 69. When the rack members 68 and 69 are rotated clockwise alternately about the pivot roller 76 by their respective eccentrics 71 and 72, the teeth on the rack members 68 and 69 will engage the teeth of gear 66. To permit the rack teeth to mesh with the gear teeth under pressure during a line feed cycle, the fulcrum or pivot roller 76 is made movable so that slight counterclockwise movement is imparted to bell crank 79, thus increasing the tension of spring 81.

As viewed in Fig. 5, the eccentrics 71 and 72 are rotated in a counterclockwise direction. When the long radius of eccentric 72 is operative to the left of the vertical center line of the shaft 75, the rack member 68 is actuated clockwise about pivot 74 to bring the rack teeth into engagement with the gear 66. The rack member 68 is also actuated downwardly to impart counterclockwise rotation to the gear 66, hence to platen 67. Then, when the long radius of eccentric 71 is operative to the right of said vertical center line, the rack member 68 is actuated counterclockwise about pivot 74 to disengage the rack teeth from the gear 66. The rack member 68 is further actuated upwardly with the teeth thereon free of the gear 66. The same actions are imparted to the rack member 69 by the eccentric 71 except that they occur alternatively, thereby imparting smoothly accelerated and decelerated movement to the gear 66.

In the performance of the line feed operation, the line feed code signal is received by the selector mechanism, such as described in said Patent No. 2,505,729, to effect a setting of the code bars 20 to select the line feed function bar 21 (Fig. 1), (similar to bar 39 shown in Fig. 29 of said patent). Pursuant to the receipt of the line feed code signal, the bail 36 will be oscillated, whereupon the function bar 21 will be reciprocated to permit shoulder 51 to engage the step 50 of the pawl 46. Then, upon leftward movement of the function bar 21, the lever 53 will be rotated counterclockwise to force the interponent 59 rightwardly.

Cooperating with the interponent 59 is an arm 83 of a clutch trip lever 84, the other arm of which is provided with a stop portion 86 adapted to coact with a laterally directed stop projection 87 on the stop disc 90 of the three-stop line feed clutch 60, which is operatively related (frictionally or otherwise) in well known manner to the power shaft 31. The clutch trip lever 84 is normally biased counterclockwise by a spring 70 and is held against a stop 73. The line feed gearing is such that each one-third revolution of the clutch will advance the platen by one line. That is, each one-third revolution of the line feed clutch 60 causes its attached spur gear 88 (Fig. 5) to rotate the line feed eccentric spur gear 89 and its attached eccentrics 71 and 72 one-half revolution. Therefore, the length of time that the line feed clutch trip lever 84 is held away from the clutch will determine the number of line feeds that occur. In the embodiment shown, the timing relationship between the cycle of the stripper blade or bail 62 and the rotation of the main shaft 31 is such that the function pawl (exemplified by pawl 46) is not stripped or disengaged from the function bar 21 until after more than one-third of a revolution of the clutch 60 has occurred. Thus, in the present illustration, the line feed clutch trip lever 84 will stop the clutch 60 after two-thirds of a revolution, or double line feed has occurred.

Accordingly, when single line feed is desired, it is necessary to strip or disengage the function pawl 46 from the line feed function bar 21 before the line feed clutch 60 completes one-third of a revolution. This is accomplished by the use of an auxiliary line feed function pawl stripper 91 (Figs. 1 and 2). The aforementioned stops 87 are integral with the stop disc 90 which is also provided with three similar cam contours on its periphery. Cooperating with said cam contours on disc 90 is a cam follower lever arm 92 mounted pivotally at 93 and normally spring urged against said periphery by spring 94. Carried pivotally on lever arm 92 at pivot 95 is an auxiliary stripper actuating member 96. Extremity 97 (Fig. 3) of member 96 is adapted to cooperate with a slot or notch 98 in the stripper 91 in such manner that said extremity 97 may be swung into and out of operative engagement with said slot to render said auxiliary stripper 96 alternatively effective and ineffective to reciprocate said stripper 91 vertically. Stripper actuating member 96 is normally biased counterclockwise (as viewed in Fig. 3) by the aforementioned spring 94 which is attached thereto. As previously alluded to, spring 94 also functions to bias the member 92 downwardly against the periphery of the disc 90. The combination cam and stop disc 90 on the three-stop line feed clutch furnishes the motive force to operate the stripper actuating member 96 once each one-third revolution of the line feed clutch 60.

The auxiliary stripper actuating member 96 is slidably carried on the stripper bail 62 through the instrumentality of slots 99 and stud screws 101. In the present embodiment of the invention, the stripper bail 62 is movable only vertically. To render said auxiliary stripper member 96 effective or non-effective, as the case may be, the member 96 is provided with a sidewardly directed extension 102 which is adapted to cooperate with a single and double line feed control mechanism comprising a two armed lever 103 (Fig. 1) mounted pivotally on a pivot 104 secured to the side frame 105 of the printer. The lower extremity 112 of lever 103 cooperates with the extension 102 as shown in Fig. 2, and the upper extremity of said lever 103 is pivotally articulated, as shown in Figs. 1 and 2, to the arm 106 of a lever 107 pivoted at 108 to said side frame 105. The upwardly extending arm 109 of lever 107 extends through and cooperates with a two-position detent bracket 111 formed in the side frame 105.

In the operation of the line feed arrangement according to the present invention, the line feed control mechanism is shown in Figs. 1, 2 and 3 in the position to produce single line feed. In this position the selective operation of the line feed function lever 21 will cause pawl 46 to be latched at shoulders 50—51, thus positioning the free end of the line feed function lever pawl 46 over the stripper bail 62 and auxiliary stripper 91. The function operating lever 53 will be rotated to cause plunger 59 to be actuated rightwardly (as viewed in Fig. 1) to rotate clutch release lever 85 clockwise to disengage end 86 from stop 87, thereby permitting the line feed clutch to rotate clockwise. This clockwise rotation at this time is limited to one-third revolution of clutch 60 because the end 97 of lever arm 96 is engaged in the slot or notch 98 of the auxiliary stripper member 91, thus causing said member 91 to be raised in advance of the normal raising of bail 62 to disengage shoulder 50 from shoulder 51, to permit the lever 53 to respond to the pull of its spring 57 to release interponent 59 and permit the clutch release lever 85 to return to its clutch arresting position before the clutch 60 has completed one-third revolution. Thus, in this position, single line feed is obtained.

Now, when the lever 107 is shifted to the dotted line position 110 (Fig. 1) indicative of double line feed, the lever 103 is swung clockwise, whereupon through its offset extremity 112, the lever arm 96 (Fig. 3) is swung clockwise to remove the end 97 from the slot 98 so that the lever arm 96 is no longer effective, upon rotation of the clutch 60, to raise the auxiliary stripper 91. Then, when the line feed signal is received, and the lever 53 is actuated, the interponent 59 will trip the clutch 60 as before. However, the bail assembly 92—96 will be oscillated during the first one-third revolution of cam disc 90 (and hence clutch 60) with no effect upon the auxiliary stripper member 91. Under this condition of operation, the disengagement of shoulders 50 and 51 is effected by the bail 62, which due to the timing, as previously mentioned, will not occur until after more than one-third of a revolution of the clutch 60 has occurred, but before two-thirds of a revolution has occurred, thereby resulting in double line feed.

Having reference to Fig. 6 there is disclosed a modified form of the present invention. The cam follower lever 122 is substituted for lever 92 and is not only pivotally supported on the shaft 93 but is also slidable thereon. Lever 122 is normally biased into contact with the periphery of disc 90 by a spring 123. It is also normally biased rightwardly by a spring 120. Formed integrally on lever 122 is an extension 124 (comparable to extension 97) which cooperates with a slot or notch 125 in the auxiliary line feed function pawl stripper

126 slidably carried on the bail 62 for vertical reciprocation relative thereto. Lever 122 is also provided with a projection 127 (comparable to projection 102) terminating in a cam surface 128. Cooperably related to the cam surface 128 is a deflected end 129 of a depending arm 131 pivotally connected to arm 132 of a bell crank lever 133 pivotally carried on a stud 134. The upwardly extending arm 135 of bell crank 133 extends through and cooperates with a two-position detent bracket 136 formed in the side frame 105.

In the position shown in Fig. 6, whereat the arm 135 is in the No. 1 position of bracket 136, the mechanism is in the position to produce single line feed, because the member 122 is biased rightwardly to bring the end of arm 124 into the slot 125 of stripper 126, whereby stripper 126 is operable independently of bail 62, as previously described, to disengage the line feed function pawl 46 from the line feed selector lever 21 before the clutch 60 has made one-third of a revolution, whereby single line feed is obtained. Then, when the lever 133 is rotated to bring the arm 135 into the No. 2 position in bracket 136, the arm 131 will be depressed, whereupon the end 129 thereof will be effective upon surface 128 to cam the member 122 leftwardly to remove the end of extension 124 from the slot 125 so that lever arm 124 is no longer effective, upon rotation of disc 90 of clutch 60, to raise the auxiliary stripper 126, thereby obtaining double line feed as previously described in connection with the principal embodiment of the invention.

It is understood that the above-described arrangements are merely illustrative of the application of the principles of the invention. Other arrangements may be devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. In a telegraph printer, selector mechanism comprising a plurality of permutation bars arranged in superposed horizontal planes, a plurality of function bars slidably mounted for movement toward and away from said permutation bars, a secondary member associated with each function bar and disposed thereabove, each secondary member provided with an engaging portion adapted to be interengageable with an engaging portion on its associated function bar, means to effect cooperative interengagement between said engaging portions, whereby said secondary member is actuated positively, periodically operated stripper means effective to disengage said secondary member from its associated function bar, an auxiliary stripper means operably associated with said periodically operated stripper means, actuating means for intermittently operating said auxiliary stripper means, cam actuated means for invariably operating cyclically said actuating means, and means for rendering said actuating means selectively effective or ineffective upon said auxiilary stripper means to render said auxiliary stripper means effective independently of said periodically operated stripper means to disengage predetermined ones of said secondary members.

2. In a telegraph printer, selector mechanism comprising a plurality of permutation bars arranged in superposed horizontal planes, a plurality of function bars slidably mounted for movement toward and away from

said permutation bars, a secondary member associated with each function bar and disposed thereabove, each secondary member provided with an engaging portion adapted to be interengageable with an engaging portion on its associated function bar, means to effect cooperative interengagement between said engaging portions, whereby said secondary member is actuated positively, periodically operated stripper means effective to disengage said secondary member from its associated function bar, an auxiliary stripper means operably associated with said periodically operated stripper means, a periodically operated power means, actuating means normally operated by said power means, swingable means carried by said actuating means for intermittently operating said auxiliary stripper means, and means for rendering said swingable means selectively effective or ineffective upon said auxiliary stripper means to render said auxiliary stripper means effective to disengage predetermined ones of said secondary members.

3. In a telegraph printer, selector mechanism comprising a plurality of permutation bars arranged in superposed horizontal planes, a plurality of function bars slidably mounted for movement toward and away from said permutation bars, a secondary member associated with each function bar and disposed thereabove, each secondary member provided with an engaging portion adapted to be interengageable with an engaging portion on its associated function bar, means to effect cooperative interengagement between said engaging portions, whereby said secondary member is actuated positively, periodically operated stripper means effective to disengage said secondary member from its associated function bar, an auxiliary stripper means operably associated with said periodically operated stripper means, a periodically operated power means, slidable means normally operated by said power means, and means for rendering said slidable means selectively effective or ineffective upon said auxiliary stripper means to render said auxiliary stripper means effective to disengage predetermined ones of said secondary members.

4. In a telegraph printer, selector mechanism comprising a plurality of permutation bars arranged in superposed horizontal planes, a plurality of function bars slidably mounted for movement toward and away from said permutation bars, a secondary member associated with each function bar and disposed thereabove, each secondary member provided with an engaging portion adapted to be interengageable with an engaging portion on its associated function bar, means to effect cooperative interengagement between said engaging portions, whereby said secondary member is actuated positively, periodically operated stripper means effective to disengage said secondary member from its associated function bar, an auxiliary stripper means operably associated with said periodically operated stripper means, actuating means for intermittently operating said auxiliary stripper means, and means for shifting said actuating means into operative engagement with said auxiliary stripper means to render said auxiliary stripper means operative independently of said periodically operated stripper means to disengage predetermined ones of said secondary members.

No references cited.