Dec. 14, 1948. F. W. HEYEL 2,456,414

TAPE ADVANCING AND RETRACTING MEANS

Filed Jan. 24, 1947

2 Sheets-Sheet 1

FIG. 1.

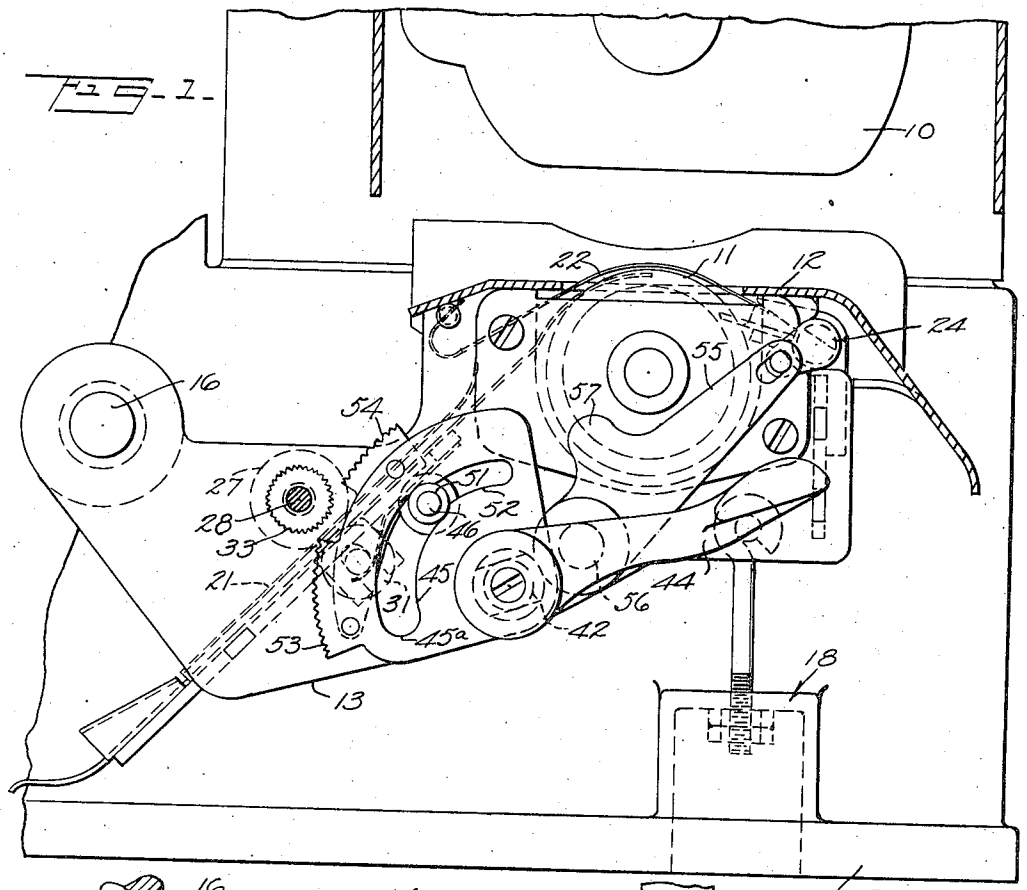
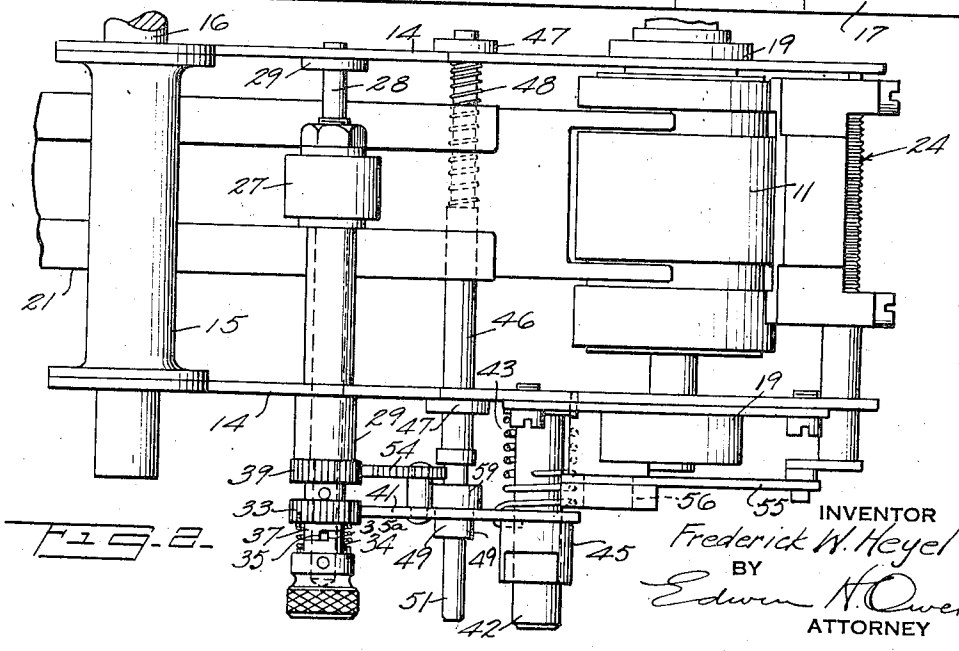


FIG. 2.



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FIG. 3.

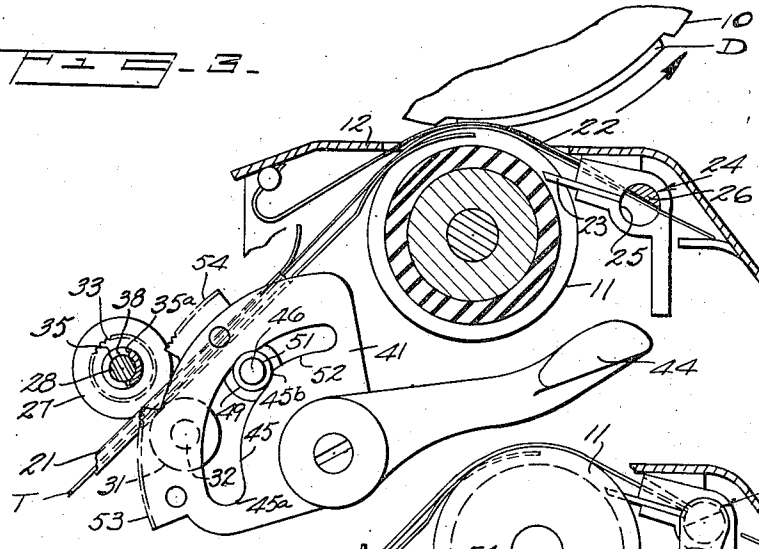


FIG. 4.

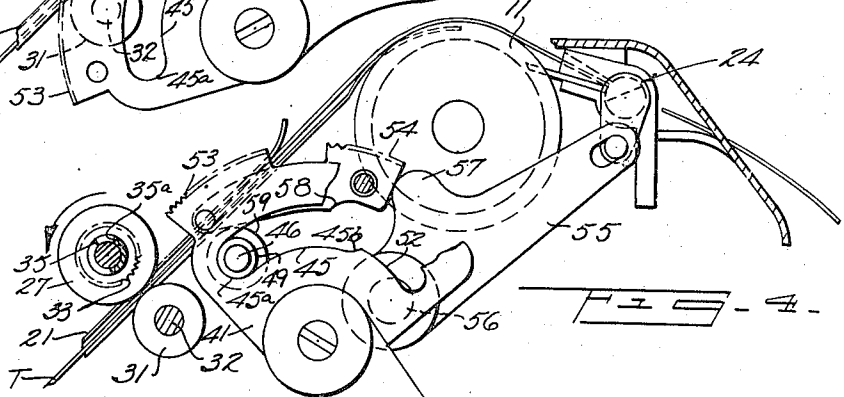


FIG. 5.

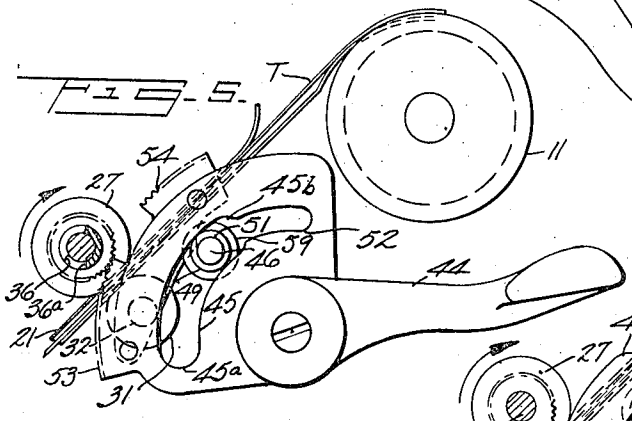
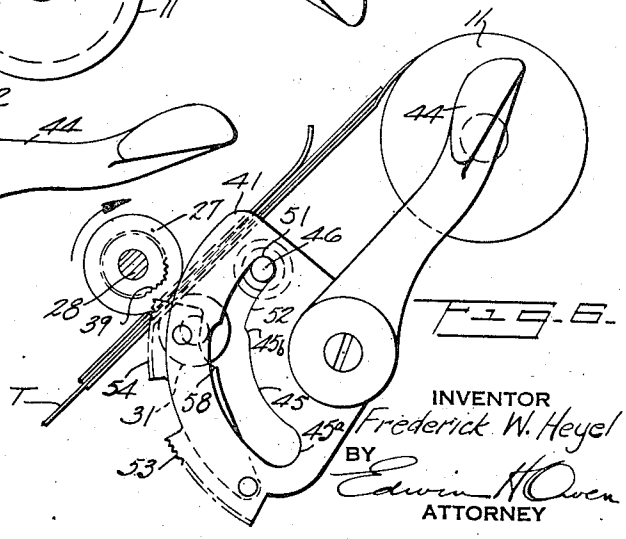


FIG. 6.



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TAPE ADVANCING AND RETRACTING MEANS

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Application January 24, 1947, Serial No. 723,915

5 Claims. (Cl. 101—235)

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This invention relates to a tape unit control mechanism as used with a printing unit in a machine for printing postage on both letters and tape at the same printing position, and more particularly to improvements in a hand controlled type of mechanism disclosed in Patent No. 1,958,355.

In postage printing machines, also known as metered mail machines, a rotary printing member is adapted to print postage on letters which are fed horizontally through the machine, and is further adapted to print on a tape strip which is guided from a tape supply to the point of printing contact between a rotary printing die and platen roller. After printing, the tape is advanced to a cutting position where the printed portion is severed from the strip. The tape is then retracted to return the leading edge thereof to the printing position.

When printing is to be effected on letters, the tape is retracted to remove the leading end away from the printing position.

Various types of tape control mechanism have been devised for the control of tape units to perform the above operations. In the arrangement herein disclosed, improvement is provided in the form of simplified tape end locating means, and of manipulative plunger control means for the release of a spring actuated tape feed sector from a normal tape printing position to a non-printing position. Among other features, there is also included novel means for providing a shorter retracting distance of movement of the tape than the advancing movement thereof after printing, to thereby provide for a margin at the leading edge during the following printing operation.

It is one object of the invention therefore to provide a simple stop arrangement for limiting the motion of a tape feed and retracting element.

It is another object to provide in combination with a tape unit of the class above mentioned, manipulative plunger means to effect control of the leading tape edge.

It is another object to provide a tape feed control, through a lost motion connection, which will provide for a margin at the leading tape edge when the said leading edge is returned to printing position after cutting.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed

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may be made within the scope of what is claimed without departing from the spirit of the invention.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein;

Fig. 1 is a front view showing a portion of a postage printing machine, including a tape unit with tape advancing and retracting mechanism;

Fig. 2 is a plan view of the tape unit as generally viewed in Fig. 1, with the feed plate, tape guide fingers and tape feed handle removed;

Fig. 3 is a detail view showing the essential elements of the tape unit, including the cutting element, and showing the parts in a position assumed at the completion of a postage printing operation;

Fig. 4 is a view similar to Fig. 3, showing the parts in a position assumed after the printed portion of the tape has been advanced to a cutting position, and includes the cutting operation;

Fig. 5 is a view showing a portion of the mechanism shown in Fig. 4, with the parts in the position assumed after the leading tape edge has been retracted to a printing position; and

Fig. 6 is a view similar to Fig. 5, showing the parts in the position assumed after the manipulation of a depressible plunger, provided for the purpose of releasing the tape mechanism for the retraction of the leading tape edge to a position away from the path of letter feed.

Referring to the drawings in detail, the parts of the postage printing device shown in the drawings include a rotary printing member 10, having a printing die D, which is adapted to cooperate with a platen roller 11 in the printing and feeding of either letters or tape. Letters are passed along the surface of a feed plate 12, and when in a proper relation to the printing member 10, a printing operation is effected in a manner well known in the art.

In the present invention a tape control unit is provided for the purpose of printing postage upon tape at the same point of printing as the printing of postage upon letters. Said tape control unit comprises a bracket 13, including side walls 14—14 secured to a bearing 15, which bearing is supported upon a shaft 16 secured to the base 17 of the machine. The free end of the bracket 13 is biased toward the printing member 10, the relative position being limited by an adjustable stop 18. The platen roller 11 is also supported within suitable bearings 19—19, carried by the side walls 14—14 of said bracket 13.

Tape guide means is provided which comprises

a leading guide 21, arranged to direct tape T (Fig. 3) from a source of supply to a printing position. Said guide means further comprises upper tape guide fingers 22, which are spaced apart to clear the printing die at either side thereof and guide the tape over the platen roller 11 and to the cutting position. A lower stripper guide 23 is also provided between the platen roller 11 and a cutting element 24. Said cutting element 24 is of the conventional rotary shear type and includes a stationary shear portion 25 and a rotary shear 26, each suitably mounted between the side walls 14—14 of the bracket 13. Further detail of the above named elements may be found in Patent No. 2,141,119.

Cooperating with the above is a tape control mechanism which comprises an upper tape feed roller 27, fixed to a shaft 28, which shaft is mounted in bearings 29—29 projecting from the side walls 14—14. An idler roller 31 is mounted on a shaft 32, supported between the walls 14—14 of the bracket 13, and cooperates with the upper roller 27 to effect feeding and retraction of tape.

Actuator means is provided for controlling the drive of the upper feed roller to either advance or retract the tape as required. Said means includes a toothed wheel 33, which is freely mounted on the shaft 28, and a clutch collar 34, which is fixed to the shaft 28. Said clutch collar 34 is provided with driven faces 35*a*—36*a*, which are adapted to cooperate with driving faces 35—36 respectively of a hub portion 37, projecting from the toothed wheel 33. As viewed in Figs. 3 and 4, it will be noted that a space 38 is provided between the upper faces 35—35*a*, and that in Fig. 5 the space is indicated between the lower faces 36—36*a*. A spring 40, secured to the members 33 and 34, normally effects the spacing 38.

Another tooth wheel 39 is fixed to the shaft 28, adjacent the toothed wheel 33.

A toothed section 41 is freely mounted upon a stud 42, which stud projects outwardly from the front wall 14 of the bracket 13, and is urged to move in a counter-clockwise direction by means of a coil spring 43. A handle 44 is fixed on a hub 45 projecting from said sector.

Within the face of the toothed sector is an arcuate slot 45, the ends 45*a* and 45*b* of which provide sector positioning when engaged by a stop plunger 46, projecting therethrough. Said stop plunger 46 is slidably mounted in bearings 47—47, projecting from the walls 14—14, and is normally urged in an outward direction by means of a coil spring 48.

An enlarged diametral portion 49 of the stop plunger 46, projects within the slot 45, and when the tape unit is in the normal tape operating position in Figs. 1 and 3, the end 45*b* of said slot 45 is urged against the projecting portion 49.

Projecting forwardly beyond the portion 49 of the stop plunger 46 is another portion 51 of narrower diameter, which narrower portion is adapted to coact with an arcuate slot 52 continuing from the right end of the slot 45, as viewed from Fig. 1. When therefore, the plunger 46 is depressed sufficiently to remove the larger diameter portion 49 beyond the slot 45, the narrower diameter portion 51, being in the path of the narrower slot 52, will allow the toothed sector 41 to be urged counter-clockwise by the coil spring 43, until the plunger stop portion 51 is engaged by the end of the narrower slot 52. See Fig. 6.

The toothed sector 41 has two toothed portions, one provided at 53 directly on the sector plate 41, which is adapted to mesh with the free toothed wheel 33, and an offset toothed portion 54 which is adapted to mash with the fixed toothed wheel 39.

A cutter acuating lever 55 is pivotally supported on a stud 56 projecting from the front wall 14, and has a lug 57 projecting therefrom and in the path of one edge of the offset toothed portion 54. The free end of the lever 55 is connected with the rotary cutter blade 26, as generally indicated at 58, Figs. 1 and 4.

Referring now to the operation of the device, and assuming that the tape unit is in a position for the printing of postage on tape, the parts would be in the position shown in Fig. 1, with the leading tape edge in a position to be engaged by the printing die D of the rotary printer 10. The printing operation is next effected, as indicated in Fig. 3, which results in the feeding of the tape while printing. It will be noted that the sector toothed portions 53 and 54 are positioned to the left and right respectively of the toothed wheels 33 and 39, as viewed in Fig. 1, thereby permitting free movement of the tape between the tape feed roller 27 and idler roller 31 while printing is effected.

At the end of a printing operation, the printed portion of the tape is advanced through the cutter blades 25, 26 by depressing the handle 44, the feed of the tape being effected when the toothed portion 53 of the sector 41 moves into engagement with the toothed wheel 33 and drives same in the direction of the arrow Fig. 4. Upon the engagement of the plunger portion 49 with the end 45*a* of the arcuate slot 45, the edge of the offset toothed portion 54 of the sector will have engaged and effected rocking of the cutter actuator lever 55, thereby causing the severing of the printed portion of the tape from the tape strip.

Return of the leading tape edge is effected by action of the return spring 43, when the handle 44 is released, the tape edge returning to a position slightly in advance of the point of engagement by the printing die D. This slightly advanced position provides for a desired margin at the leading tape end before printing of the subsequent postage impression. To produce this margin, the previously stated spacing arrangement of the clutch faces of clutch collar 34 relative to the driving faces of the hub portion 37 is utilized.

Referring to Fig. 3, it will be noted that the upper faces 35—35*a* are spaced apart and that the lower faces 36—36*a* are in engagement. Inasmuch as the hub 37 is the driving member, the clutch collar 34 will be driven in a counter-clockwise direction when the handle 44 is depressed, thereby effecting a like rotation of the tape feed wheel 27. This action, which occurs after printing, will effect movement of the tape from the position of Fig. 3, to the cut-off position of Fig. 4.

When the handle 44 is released, and the direction of rotation of the driving hub 37 is reversed, to effect the return of the leading tape end to a printing position, the initial motion of the hub portion 37 will not effect the drive of the clutch collar 34 until the driving face 35 moves the distance of the space 38 to engage the face 35*a* of the clutch collar 34. This movement allows a portion of the driving motion to be effected between the toothed portion 53 and toothed wheel 33 without effecting tape feed. Hence, the lead-

ing end of the tape is moved a shorter distance during retraction than during advancement, which leaves the leading tape end slightly in advance of the printing position.

When it is desired to print postage impressions upon letters, instant removal of the leading tape end away from the printing position is adapted to be effected upon depressing the plunger **46**. The latter operation moves the projection **49** out of engagement with the arcuate slot **45** and thus causes the spring **43** to move the sector **41** in a counter-clockwise direction from the position of Fig. 5 to that of Fig. 6. During said movement the offset toothed portion **54** will engage and drive the toothed wheel **39** in a clockwise direction, the latter being fixed to the shaft **28**, as previously stated. The upper feed roller **27** is thus driven in a clockwise direction to retract the leading tape end to a position away from the point of printing and clear of the path of letter feed.

Return of the tape to a printing position is effected, when again desired, by depressing the handle **44**. A reverse drive between the toothed segment **54** and toothed wheel **39** will move the tape the same distance forward as the distance retracted. The projection **49**, will upon becoming aligned with the arcuate slot, re-engage the slot **45** to provide the proper stop relative to the slot end **45b**. To prevent overthrow of the sector **41**, before the plunger is returned to its normal extended position, a stop **58** is provided at the lower right end of the offset toothed portion **54**. Said stop **58** will bear against the peripheral surface **59** of another portion the stop plunger **46**, which surface is of a larger diameter than the portion **49**. When the projection **49** has been projected the full distance through the slot **45**, the stop **58** will be clear of the surface **59**, as seen in Fig. 2.

Having described the invention, what is claimed is:

1. In a letter and tape printing device, the combination with a printing member arranged to print impressions upon letters or tape at the same printing position; of tape advancing and retracting devices comprising, a feed roller engaging one surface of the tape and including a toothed member connected therewith, an idler roller cooperating with the feed roller, a toothed sector adapted to mesh with the toothed member to effect rotation of the feed roller and including hand control means therefor to effect movement of the sector in one direction, means normally urging said sector in an opposite direction, said sector having one stop means associated therewith to limit the return thereof and of the leading tape edge to a printing position, a depressible stop plunger having one portion arranged to engage the said sector stop means when in the latter named position, and a second stop means associated with said sector and cooperating with said depressible stop when depressed to provide additional sector and tape movement.

2. In a letter and tape printing device, the combination with a printing member arranged to print impressions upon letters or tape at the same printing position; of tape advancing and retracting devices comprising, a feed roller engaging one surface of the tape and including a toothed member connected therewith, an idler roller cooperating with the feed roller, a toothed sector adapted to mesh with the toothed member to effect rotation of the feed roller and including hand control means therefor to effect movement of the sector in one direction, means normally urging said sector in an opposite direction, said sector having an arcuate slot therein, a depressible stop plunger projecting through said slot and coacting with the ends of the slot to limit the stroke of the sector in either direction, a narrower arcuate slot continuing from the first named slot, and a projection on said plunger having a reduced diameter which will engage the narrower slot and allow additional movement of the sector and tape when the plunger is depressed.

3. In a letter and tape printing and tape cutting device, the combination with a rotary printing member arranged to print impressions upon letters or tape at the same point of printing and to advance the tape while printing; of tape advancing and retracting devices to advance the tape to a cutting position after printing then return the leading tape edge to a printing position after cutting respectively and comprising, a feed roller engaging one surface of the tape and including a toothed member rotatable therewith, an idler roller cooperating with the feed roller, a toothed sector adapted to mesh with the toothed member to effect rotation of the feed roller and including hand control means therefor to effect movement of the sector in one direction, a spring connected with the toothed sector to normally urge said sector in an opposite direction, said sector having an arcuate slot therein, a spring returned depressible stop plunger projecting through said slot and coacting with the ends of the slot to limit the stroke of the sector in either direction and to thereby control the position of the tape edge, a narrower arcuate slot continuing from the first named slot, and a projection on said plunger having a reduced diameter which will engage the narrower slot and allow additional movement of the sector and tape when the plunger is depressed to a position placing the reduced portion in alignment with the narrower slot, thereby causing the sector to move the leading tape edge to a position away from the printing point.

4. In a letter and tape printing device, the combination with a printing member arranged to print impressions upon letters or tape at the same printing position and means for cutting the tape; of tape advancing and retracting devices comprising, a feed roller engaging one surface of the tape and including a toothed member connected therewith, an idler roller cooperating with the feed roller, a driving toothed sector adapted to mesh with the toothed member and including hand control means therefor to effect movement of the sector in one direction to advance the tape to a cutting position after the printing thereof, means normally urging said sector in an opposite direction, said sector having stop means cooperating with a relatively fixed stop to limit the return of the leading tape edge to a printing position, and a lost motion drive between the driving sector and roller operable to effect a predetermined movement of the sector and toothed member before the feed roller is rotated, whereby the return movement of the tape becomes less than the advance movement thereof to thereby provide a margin at the leading tape edge when printing is again effected.

5. In a letter and tape printing device, the combination with a printing member arranged to print impressions upon letters or tape at the same printing position and means for cutting the tape; of tape advancing and retracting devices comprising, a feed roller engaging one surface of the tape and including a toothed member connected therewith, an idler roller cooperating with the feed roller, a driving toothed sector adapted to

mesh with the toothed member and including hand control means therefor to effect movement of the sector in one direction to advance the tape to a cutting position after the printing thereof, a cutter operating member connected with the cutting means and engageable by the sector at the end of the tape feeding stroke thereof to effect cutting of the printing portion from the tape strip, spring means normally urging said sector in a return direction, said sector having stop means cooperating with a relatively fixed stop position to limit the return of the leading tape edge to a

printing position, and a lost motion drive between the driving sector and roller operable to effect a predetermined movement of the sector and toothed member before the feed roller is rotated, whereby the return movement of the tape becomes less than the advance movement thereof to thereby provide a margin at the leading tape edge when printing is again effected.

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No references cited.