March 11, 1930. L. RAMDOR 1,750,357

STRIP FEEDING MECHANISM

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Fig. 1.

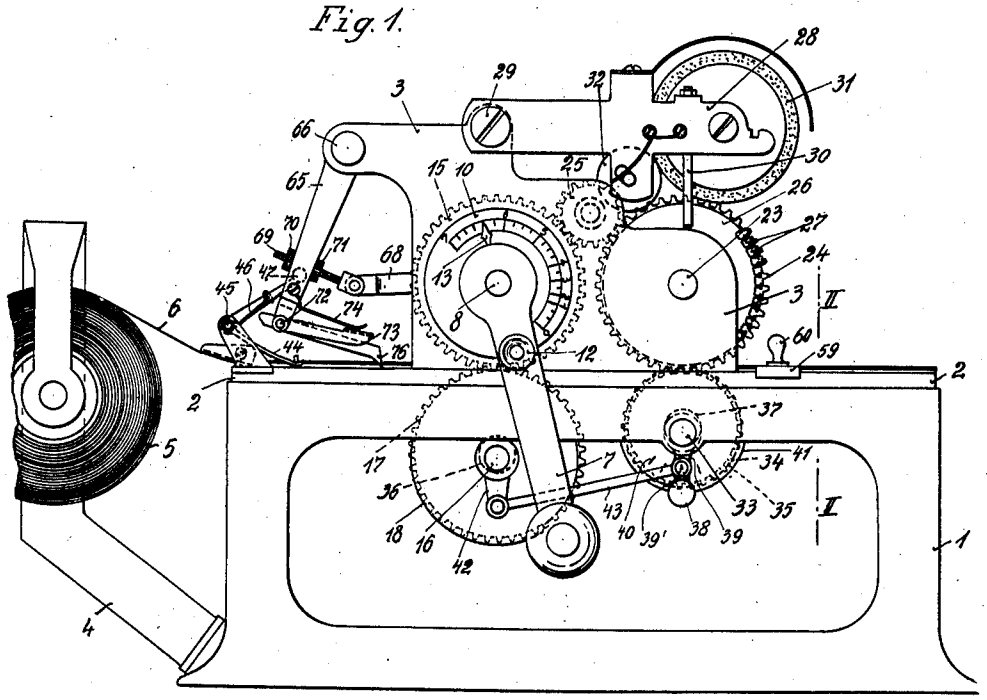
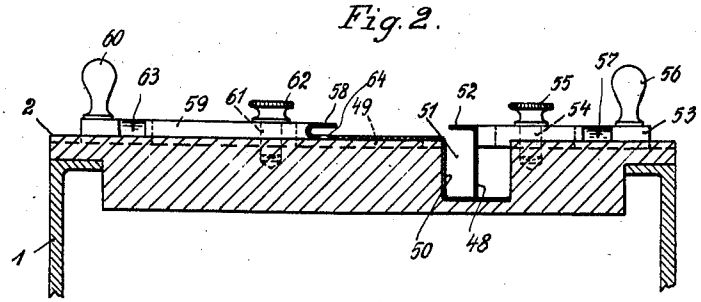


Fig. 2.



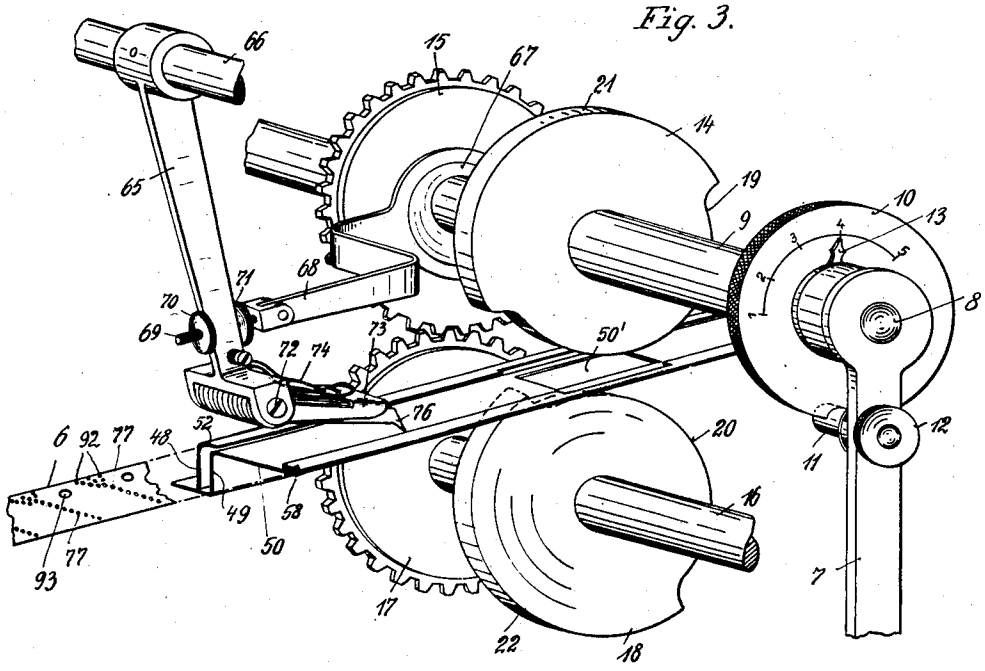
Inventor:
Leopold Ramdor
by Kleinbaum
Atty.

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Fig. 3.



Inventor:
Leopold Ramdor
by
Atty.

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UNITED STATES PATENT OFFICE

LEOPOLD RAMDOR, OF FALKENSEE, BERLIN, GERMANY

STRIP-FEEDING MECHANISM

Application filed January 11, 1928, Serial No. 246,028, and in Germany January 11, 1927.

My invention relates to strip feeding mechanism and more particularly to mechanism for feeding strips or webs in printing machines, automatic stamp and other vending machines, machines for stamping letters or for affixing stamps to them, and the like. My invention will be described in connection with a machine for printing labels or etiquettes on a perforated strip, but it is understood that I am not limited to this particular case, but that my machine may be applied wherever it is desired to feed strips for any purpose whatever.

It is an object of my invention to provide improved means for regulating the feed instead of the usual mechanisms resembling ratchet wheels which involve the drawback that the pitch of the ratchet wheel is the regulation limit. Besides such regulating means may cause unequal feeding of the strip.

In order to do away with these drawbacks, I provide means for timing the relative movement of two feeding members so that their period of cooperation is varied in order to vary the length of the feeding stroke. By this means it is possible to regulate the feed within very fine limits but within the full range of regulation which is feasible in a machine of given size. In cases where the feed mechanism cooperates with a rotary cylinder, my invention is particularly useful as it permits timing the feed very exactly with respect to the rotation of the cylinder.

In the drawings affixed to this specification and forming part thereof, a machine for printing labels or etiquettes embodying my invention are illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is an elevation of the complete machine,

Fig. 2 is a section of its table on the line II—II in Fig. 1, drawn to a larger scale,

Fig. 3 is a perspective illustration of one type of feeding mechanism.

Referring to the drawings, and first to Fig. 1, 1 is the frame of the machine to which the table 2 and the frame 3 of the feeding mechanism, and a bracket 4 for a supply roller 5, are secured. 6 is the strip from which the labels are taken, which may be perforated as illustrated in Fig. 3.

Rotation is imparted to the printing mechanism by means of a crank 7 on the main driving shaft 8 of the printing mechanism in the frame 3. A hollow shaft 9 is rotatably carried on the shaft 8, 10 is a graduated disc at the outer end of the hollow shaft 9, 11 is a clamp which is carried in a hole of the crank 7 and notched for the reception of the edge of the disc 10, 12 is a knurled nut on the threaded end of the clamp 11, and 13 is an index on the boss of the crank 7 by which the relative position of the crank and the disc is indicated.

14 is a feeding member on the inner end of the hollow shaft 9, 15 is a spur gear secured on the outer end of the shaft 8, 16 is a shaft which extends in parallel to the shaft 8 in the frame of the machine below the table 2, 17 is a spur gear carried on the outer end of the shaft 16 and meshing with the spur gear 15, and 18 is the other feeding member which is seated on its shaft 16 in line with the upper member 14. As will appear from Fig. 3, the members are cut away for part of their perimeters at 19 and 20 and they will feed the strip 6 which is inserted between them only while the elevated portions 21 and 22 of the members are engaging the strip on either side. It will be understood that by varying the relative position of the shafts 8 and 9 through the medium of the disc 10 and the clamp 11 the relative position of the members 14 and 18 is also varied and that, as the clamp 11 may be fixed anywhere on the disc 10, the regulation is not subjected to a lowest limit as to its exactitude by the pitch of a ratchet wheel mechanism or the like, as in the existing machines referred to.

23 is a shaft extending in the frame 3 at the same level in parallel with the shaft 8, 24 is a spur gear on the shaft 23, and 25 is an intermediate pinion meshing with the gears 15 and 24 so that rotation is imparted to the shaft 23 when the shaft 8 is rotated. 26 is a fluted printing cylinder secured on the shaft 23 and equipped with types 27 which may be inserted and exchanged in its flutes as required for the desired printing of the strip 6.

28 is a frame pivoted on the frame 3 at 29 and supported on the frame 3 of the printing mechanism by stays 30 one of which appears in Fig. 1. 31 is an inking cylinder carried in the frame 28 and adapted to be engaged by the types 15 when they are rotating beneath it, and 32 is a distributing roller which removes adhering ink from the edges of the types. The frame 28 may be supported on its stays 30 by gravity, or springs, not shown, will be provided for holding it down.

33 is a shaft extending in parallel to the shaft 16, 34 is a spur gear on the shaft which meshes with the spur gear 24 on the shaft 23 and 35 is an impression cylinder on the shaft 33 which serves to hold the strip 6 engaged with the type cylinder 26 above.

Means may be provided for varying the centres of the shafts 8 and 16 and the shafts 23 and 33 so as to vary the pressure exerted on the strip by the feeding members 14, 18 and the type and impression cylinders 26, 35 respectively. Such means as illustrated in Fig. 1 may comprise eccentric journals 36 and 37 for the shafts 16 and 33. The journals are adjusted by means of a handle 38 which is secured at the end of a crank 39, adapted to rotate the eccentric journal 37. Clamping means, an index 39′ and a graduation 40 on a disc 41 extending in concentric relation to the shaft 33, are provided for indicating the degree to which the journal 37 has been rotated. The movement of the crank 39 is transmitted to a crank 42 on the journal 36 of the shaft 16 through the medium of a connecting rod 43 so that the journals 36 and 37 and consequently the positions of the shafts carried in them are regulated in unison.

The strip 6 upon entering the machine is engaged by a braking finger 44 keyed on a shaft 45 above the plate 2, which imparts tension to the strip and prevents undesired displacement. A spring 46 on the bracket exerts pressure on a handle 47 on the shaft 45 by which the finger may be lifted from the strip if desired.

The sides of the strip are engaged by slide bars 48 and 49 having bent-over flanges 52, 58 on the insides for guiding the strip, and a support 50 which is secured in a groove 51 of the table 2, being of Z-shape so that one of its flanges is on top of the table 2 and the other flange is on the bottom of the groove 51, and recessed at 50′ for the members 14, 18 and partly cut away at its rear end for the impression cylinder 35. The flange within the groove is engaged by the slide bar 48, a flange 52 on the bar engaging the strip 6 from above. A lug 53 projects on one side of the slide bar 48 and is inserted in a groove of the table 2, a threaded pin 54 having a nut 55 being inserted in the plate 2 and engaging in a slot of the lug so that the lug may be displaced in its slot and consequently the bar 48 in its groove 51 when the nut is unscrewed. A handle 56 facilitates the adjustment of the slide bar 48 and a mark 57 serves for indicating its position. The slide bar 49 is of similar design having a flange 58 for engaging the strip 6, a lug 59 with a handle 60, a pin 61, a nut 62 and a mark 63, for the objects described with reference to the bar 48. The slide bar 49 extends below the horizontal part of the support 50. As shown in Fig. 2, the slide bar has nearly been pushed home, only a clearance 64 being available between the lower edge of its flange 58 and the adjacent edge of the horizontal part of 50. It will be understood that by displacing the slide bar 49 through the medium of its handle 60, strips 6 of varying width may be accommodated in the machine, the slide bars 48 and 49 being adjusted in accordance.

65 is an auxiliary feeding member which serves for properly adjusting the perforations of the strip 6 with respect to the feeding members 14, 18. 66 is a shaft rotatably carried in the frame 3 on which the auxiliary feeding member is secured. 67 is an eccentric on the shaft 8, and 68 is a rod by which it engages the member 65, a threaded pin 69 being formed on the end of the rod 68, and nuts 70. 71 being provided for varying the effective length of the rod 68.

The lower end of the member 65 is forked and provided with a pin 72 on which is fulcrumed a substantially U-shaped frame. 76 are fingers of very thin steel with pointed ends adapted to engage in perforations 77 of the strip. The fingers 76 are fitted to rock about the pin 72 at their rear ends while the web of the frame 73 bears on them from above, and the flanges of the frame support them laterally. 74 is a spring which is secured to the fork 65 at one end and with its other end exerts downward pressure on the frame 73 to make the fingers 76 enter the holes in the strip.

When the strip is threaded into the machine, the initial position of the auxiliary feeding member 65 is adjusted by means of the nuts 70, 71 so that it will engage the perforation which is presented to it and place it in proper position with respect to the types on the printing cylinder.

The operation of my machine is as follows:

The finger 44 having been raised by the handle 49, the strip is threaded between the slide bars 48 and 49 which are adjusted for its width. The crank 7 is set on the disc 10 for the desired relative position of the feeding members 14 and 18 and the length of the eccentric rod is adjusted by the nuts 70, 71. As in a perforated strip the lengths between two perforations are never equal throughout and the proper adjustment of the members 14, 18 also involves certain difficulties, the stroke of the auxiliary member 65 is so selected with respect to the feeding movement of the principal members 14, 18 that these perform only part of the feeding stroke, that is, the feeding

movement which they impart to the strip is only a fraction of the total feeding movement, being completed by the auxiliary member 65, and as this member is engaging the perforations 77, it will be understood that irregularities in the pitch of the perforations will be automatically rectified. When the member 65 is rocked to feed the strip, it will slide thereon, as the finger 44 is holding the strip firmly against displacement, until its fingers 76 engage a row of perforations, and the strip is fed forward until the auxiliary member 65 has completed its stroke. This makes up not only for irregularities in the pitch of the perforations but also for irregularities in the feeding action of the members 14, 18 the operation of which is so timed with respect to that of the auxiliary member 65 that their elevated portions 21, 22 will engage the strip only after the auxiliary member 65 has completed its stroke. It is possible to adjust the parts of the feeding mechanism so that the feed is equal to several lengths of the labels. In this case the auxiliary member 65 will skip any desired number of perforations and engage only those perforations, for instance, each third row, which correspond to the feed required. By varying the effective length of the rod 68 as described the initial position of the member 65 with respect to the shaft 8 is varied.

The perforations 77 may be arranged as desired and as shown in Fig. 3 by way of example. Each row of perforations is provided with two diverging branches 92 at one end and a hole 93 is punched intermediate the branches for the insertion of a cord or the like by which the label is affixed to any object. When the labels are separated along their perforations, they will have beveled edges at the sides of the hole 93 which improves their appearance. Obviously, any other arrangements of perforations may be provided.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

I claim:—

1. Strip feeding mechanism comprising a pair of feeding members, strip engaging projections extending over part of the effective surface of each member, means for introducing the strip between said members, means for imparting rotation to said members and means for varying the relative position of said projections.

2. Strip feeding mechanism comprising a pair of feeding members, strip engaging projections extending over part of the effective surface of each member, means for introducing the strip between said members, means for imparting rotation to said members, means for varying the relative position of said projections, an auxiliary member adapted to engage perforations in said strip, and means for imparting to said auxiliary member a feeding movement which is part of the total feeding movement.

3. Strip feeding mechanism comprising a pair of feeding members, strip engaging projections extending over part of the effective surface of each member, means for introducing the strip between said members, means for imparting rotation to said member, means for varying the relative position of said projections, an auxiliary member adapted to engage perforations in said strip, means for imparting the said auxiliary member a feeding movement which is part of the total feeding movement, and means for varying the initial position of said auxiliary member.

4. Strip feeding mechanism comprising a pair of feeding members, strip engaging projections extending over part of the effective surface of each member, means for introducing the strip between said members, means for imparting rotation to said members, means for varying the relative position of said projections, an auxiliary member adapted to engage perforations in said strip, means for imparting to said auxiliary member a feeding movement which is part of the total feeding movement, and an operative connection between said principal members and said auxiliary member comprising means for so timing the relative movement of said members that said auxiliary member will perform its function before said principal members start into operation.

5. Strip feeding mechanism comprising a driving shaft, means for rotating said shaft, a hollow shaft on said driving shaft, a feeding member on said hollow shaft, means for varying the relative angular position of said driving shaft and said hollow shaft, a mating feeding member adapted to cooperate with said first-mentioned feeding member, and means for imparting rotation to said second member from said driving shaft.

6. Strip feeding mechanism comprising a pair of feeding members, strip engaging projections extending over part of the effective surface of each member, means for introducing the strip between said members, means for imparting rotation to said members, means for varying the relative position of said projections, an auxiliary member, a finger fulcrumed to said member and adapted to engage perforations in said strip, means for applying said finger to said strip under resilient pressure, and means for imparting to said auxiliary member a feeding movement which is part of the total feeding movement.

In testimony whereof I affix my signature.

LEOPOLD RAMDOR.