Oct. 15, 1957 T. G. TURNER 2,809,829

STRIP FEEDING DEVICE

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FIG 1

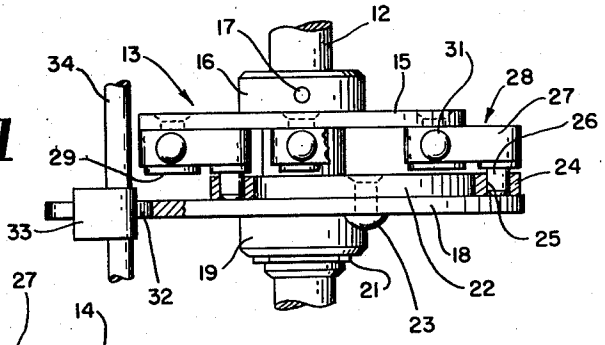


FIG 2

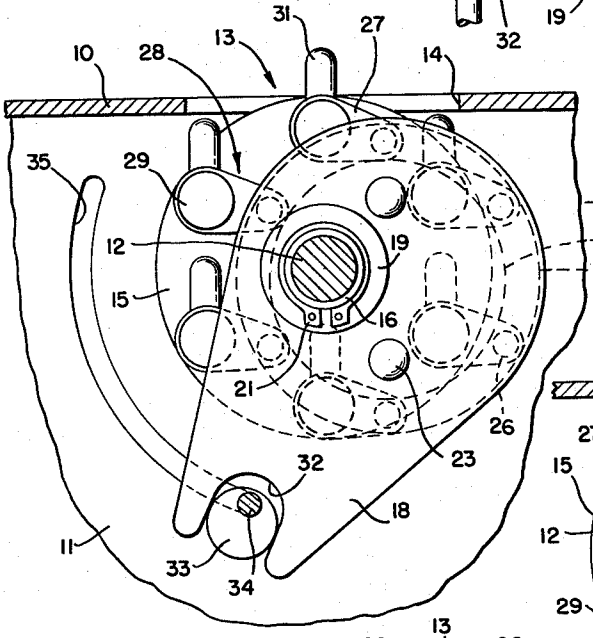


FIG 3

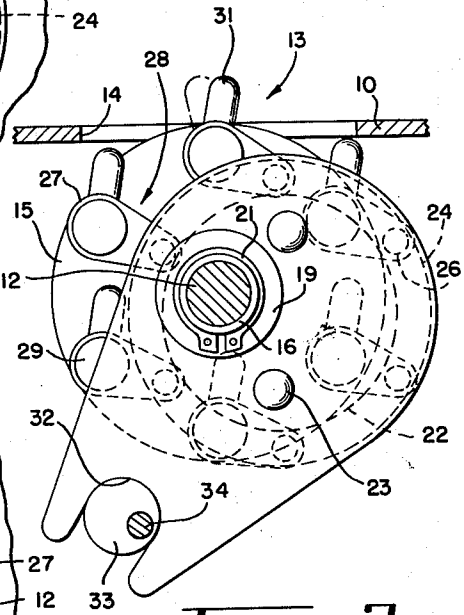
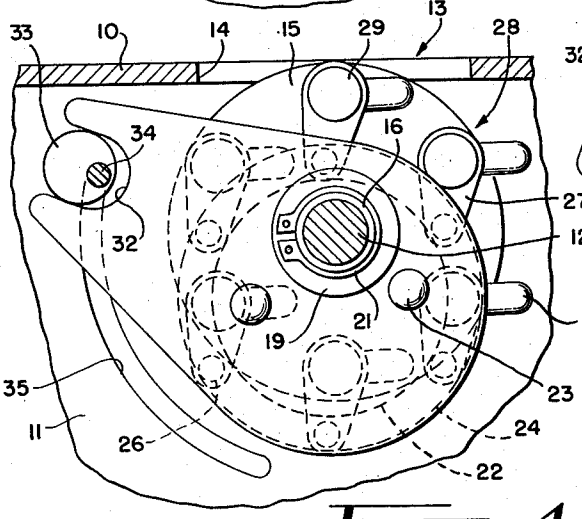


FIG 4



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STRIP FEEDING DEVICE

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10 Claims. (Cl. 271—2.3)

This invention relates to strip feeding devices, and more particularly to pin feeding mechanism for the advancing of series connected manifold business forms and like strip material.

The object of the invention is to improve the construction as well as the means and mode of operation of pin type strip feeding devices, whereby they may not only be economically manufactured, but will be more efficient in use, uniform in action and be unlikely to get out of repair.

A further object of the invention is to adapt an escalator movement in feeding pin mechanisms of the kind described to a general utility.

Another object of the invention is to enable feeding pins in a movement as described to be set to operating and non-operating positions, it being contemplated that in the operating position thereof the feeding pins will occupy an erect position and that in the non-operating position thereof the feeding pins will be cocked or tumbled angularly from their operating positions.

A further object of the invention is to provide for angular tilting of the feeding pins for better feeding of a larger number of forms. In collating work, for example, multi-part forms sometimes are run in two sets and then placed together. With the pins tilted slightly forward giving a slightly hooked condition all of the parts of the strip can be collated at once. Also, in the event of a slight discrepancy in the printing of a set of forms a compensating adjustment can be made by tilting the feeding pins slightly one way or the other, realigning or reregistering the forms while they are being fed.

A still further object of the invention is to provide a generally new feeding device which is improved in respect of compactness and simplicity and which offers advantages of use, for example in that the pins may project a greater distance through and beyond the determined plane of the strip for greater feeding efficiency.

A further object of the invention is to provide a strip feeding device embodying the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein set forth, or their equivalents.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation, as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

In the accompanying drawing, wherein is shown one but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a view in top plan of a strip feeding device in accordance with the instant invention, shown in connection with elements of an autographic register or like machine;

Fig. 2 is a fragmentary view in side elevation, showing the pin feeding device of Fig. 1 installed in an autographic register or like machine and in an operating position;

Fig. 3 is a view like Fig. 2, showing the feeding pins in a relatively tilted position; and

Fig. 4 is a view similar to Figs. 1 and 2, showing the feeding pins adjusted to a non-operating position.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawing, the pin feeding device of the invention is disclosed as embodied in a machine presenting a flat bed or table **10** supported on frames **11** and on which the strip material rests as it is advanced in a plane parallel to the table. In transverse underlying relation to the table **10** is a rotary shaft **12** having its ends journaled in the frames **11**. On the shaft **12** is a pin feed device **13**, of which there may be two or more, having feeding pins extensible through an opening **14** in the table **10** to engage marginal perforations in the overlying strip.

The pin feeding device **13** comprises a disc **15** formed integrally with or suitably secured to a sleeve **16**, the latter being mounted on the shaft **12** and secured thereto for unison rotation, as by a stake **17**.

Spaced longitudinally along the sleeve **16** from the disc **15** is a control plate **18** rotatably mounted on such sleeve and having a hub **19**. A retaining ring **21** acting on the hub **19** holds the control plate **18** from axial movement in one direction. The plate **18** is eccentrically disposed on the sleeve **16**, and, on that side thereof facing the plate **15**, is a hub or bearing member **22**. The hub **22** is eccentrically disposed relative to the shaft **12** and to the disc **15** and is secured to the control plate **18** by rivets **23**. Rotatably mounted on the hub **22** is a second disc element **24** having the shape of a ring and a circumferential series of holes **25** therein.

The holes **25** receive pivot pins **26** on the base portions **27** of feeding pins **28**. The opposite ends of the base portions **27** are connected to the disc **15** by pivot pins **29**. Standing erect on said opposite end of each of the base portions **27**, and in perpendicular relation to the pivot pins **26** and **29**, are pin portions **31**. The feeding pins **28** are arranged in circular series and connected as described to cause successive pins progressively to enter, to pass through, and to be withdrawn from the opening **14** of the table **10**. Thus, the feeding pins have a circumferential area of projection of the pin portions **31** which coincides with the location of opening **14**. Moreover, it will be noted that the construction and arrangement of parts is such that the pin portions enter and leave the slot **14** along substantially straight line paths and so are similarly engaged and disengaged with respect to strip perforations.

The control plate **18** has an outer free end in which is located a fork or recess **32**. A roller member **33** is received in the slot or recess **32** and a rod **34** is passed through the roller **33**, in eccentric relation thereto. The ends of the rod **34** are received in curved slots **35** in the side frames **11**, and one such end may conveniently be extended outside such frame for manual manipulation. The roller **33** and rod **34** tend normally to be a relatively stationary means, forming a part of the machine frame. So disposed, they prevent a rotary movement of the control plate **18** about the shaft **12** and the control plate and hub **22** thereon thus become reactant means about which the disc or ring **24** may freely rotate. It will be understood in this connection that the shaft **12** represents a means for action of the pin feeding device, the shaft being suitably turned or rotated intermittently by hand or by power means. The disc **15**, being connected to the shaft **12** for unison movement, rotates with the shaft. Through the feeding pins **28**, the disc **15** is effective to turn also the disc **24**, with the feeding pins making continuous compensating movements at the ends of their base portions **27** to keep the pin portions **31** in an erect substantially par-

allel relation to one another throughout rotation of the discs.

Rotary adjustment of the shaft **34** serves to move the roller **33** eccentrically in either a clockwise or counterclockwise direction. Such rotary motion of shaft **34** moves the control plate **18** a relatively slight distance, as for example from the position of Fig. 2 to the position of Fig. 3. In so moving, the control plate **18** through the hub **22** thereon depresses or rocks downwardly the base portions **27** of the feeding pins **28**, so tilting the pin portions **31** thereof. In the illustrated instance the rotary motion of shaft **34** has been in a direction to tilt the feeding pins to the right as viewed in the drawing. It will be apparent, however, that an opposite direction of rotary adjustment of the rod **34** would result in an opposed or leftward tilting movement of the feeding pins.

Greater extremes of movement of the control plate **18** are possible by a bodily shifting motion of the rod **34**. Thus, movement of the rod **34** from the position shown in Fig. 2 at the bottom of slot **35** to the position shown in Fig. 4 at the top of the slot effects a substantially 90° change in the position of the hub **22** on plate **18**. The feeding pins **28** are thus tumbled or cocked so that the pin portions **31** occupy a horizontal position parallel to the table **10** and are unable to enter the opening **14** therein. It may be said that the feeding pins or the feeding device of which they are a part have been adjusted to vary the circumferential area of projection of the pins. With respect to opening **14** and the strip material passing thereover, it may be said that with the rod **34** adjusted as seen in Fig. 1 the pin feeding device is in an operating position and that with the rod adjusted as shown in Fig. 4 the pin feeding device is in a non-operating position.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of the several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A strip feeding device, including a rotatable shaft, a disc in concentric relation to said shaft and connected thereto for unison rotation, a control plate rotatably mounted on said shaft in side by side relation to said disc and having an eccentric hub formation facing said disc, ring means rotatably mounted on said hub formation, feeding pins interposed between said disc and said ring means and pivotally connected thereto, and relatively stationary means interengaged with said control plate to inhibit rotation thereof with said shaft.

2. A strip feeding device according to claim 1, characterized in that said relatively stationary means has the character of an eccentric and is adjustable in a rotary sense and in a bodily shifting sense to effect rotary adjustment of said control plate about said shaft.

3. A strip feeding device, including a rotatable shaft, means for supporting a pair of discs in side by side relation on said shaft, one of said discs being concentric to said shaft and connected thereto for unison rotation and the other one of said discs being eccentric to said shaft and rotatable relatively thereto, and feeding pins between said discs, each of said pins comprising a projecting pin portion and a base portion, said base portion being pivotally connected at longitudinally spaced apart points to both said discs whereby to hold the several said pin portions in approximately parallel relation during rotation of said shaft.

4. A strip feeding device according to claim 3, characterized in that said means for supporting said discs includes a relatively stationary eccentric mounting said other disc and adjustable to accomplish a tilting adjustment of said feeding pins.

5. A strip feeding device, including a rotatable shaft, relatively stationary means supporting said shaft, a disc in concentric relation to said shaft and connected thereto for unison motion, ring means in surrounding eccentric relation to said shaft and in side by side relation to said disc, feeding pins between said disc and ring means, each of said pins comprising a projecting pin portion and a base portion, said base portion being pivotally connected at longitudinally spaced apart points to both said disc and said ring means, an eccentric rotatable on said shaft and providing a mount for said ring means, and means on said relatively stationary means interengageable with said eccentric positively to hold said eccentric against rotation.

6. A strip feeding device according to claim 5, characterized in that said last named means is adjustable rotatably to move said eccentric for tilting adjustment of said feeding pins.

7. A strip feeding device, including relatively rotatable discs in side by side eccentric relation to one another, feeding pins received between said discs and pivotally connected thereto, a shaft extending through said discs, one of said discs being concentric to said shaft and connected thereto for unison motion, a control plate rotatable on said shaft and having a hub on one side thereof concentric to the other one of said discs and eccentric to said shaft, said other disc being rotatably mounted on said hub, and a relatively stationary part interengaged with said control plate.

8. A strip feeding device, including relatively rotatable discs in side by side eccentric relation to one another, feeding pins received between said discs and pivotally connected thereto, a shaft extending through said discs, one of said discs being concentric to said shaft and connected thereto for unison rotation, relatively stationary means supporting said shaft, a control plate rotatable on said shaft and having a hub on one side thereof concentric to the other one of said discs and eccentric to said shaft, said other disc being rotatably mounted on said hub, and a part on said relatively stationary means interengaged with said control plate, said part being adjustable relatively to said stationary means to rock said control plate relatively to said other disc.

9. A strip feeding device according to claim 8, characterized in that said part is adjustable in a first sense to tilt said feeding pins and in another sense to vary the circumferential area of projection of said pins.

10. A strip feeding device, including a pair of disc elements in parallel longitudinally offset relation to one another, feeding pins received between said elements and pivotally connected at spaced apart points to both thereof, means supporting and rotating one of said discs, other means providing a relatively stationary bearing for the other one of said discs, and means for eccentrically moving said bearing.

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