Dec. 22, 1953 J. T. DAVIDSON 2,663,196

STRIP FEEDING DEVICE

Filed Jan. 12, 1950

Fig. 1

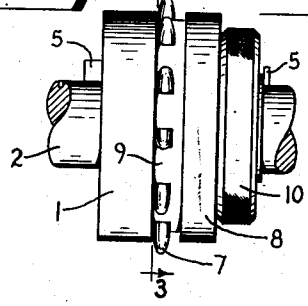


Fig. 2

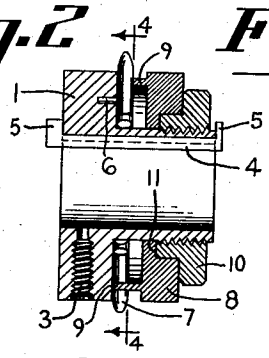


Fig. 3

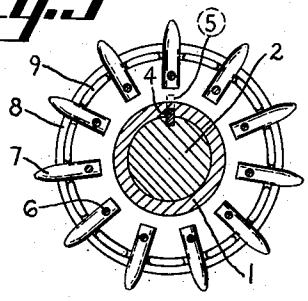


Fig. 4

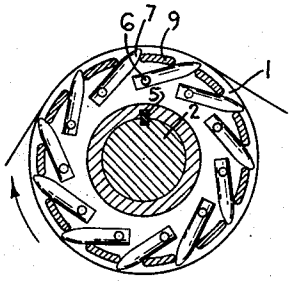


Fig. 5

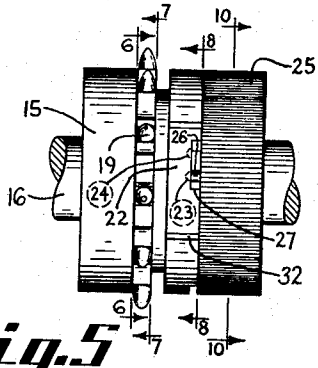


Fig. 6

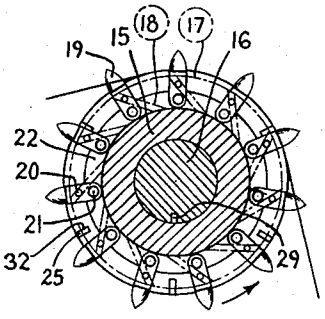


Fig. 7

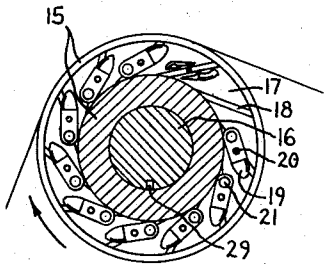


Fig. 8

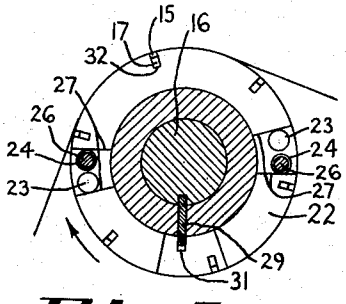


Fig. 10

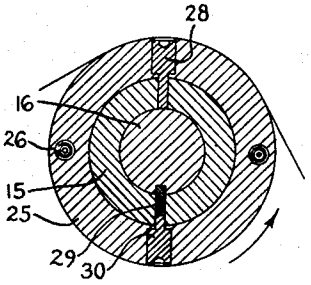


Fig. 9

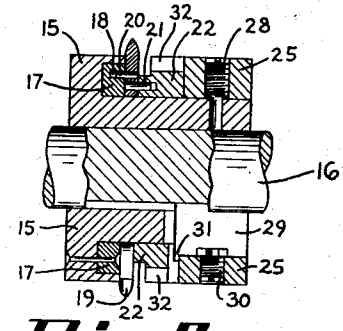
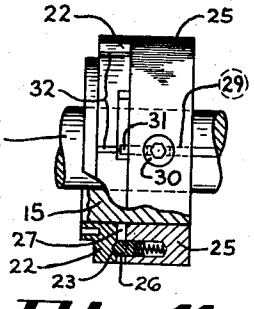


Fig. 11



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STRIP FEEDING DEVICE

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Application January 12, 1950, Serial No. 138,226

16 Claims. (Cl. 74—243)

1

This invention relates to pin type strip feeding devices, and more particularly to a retractible pin type strip feeding device in which the individual feeding pins are simultaneously withdrawn or retracted within the periphery of the feeding device.

Positive pin type strip feeding devices embodying a plurality of pin wheels are now commonly used and generally well known. There are two common types of pin wheel employed, one having reciprocating pins and the other having fixed pins. In the first type, the pins are progressively projected from within the periphery of the wheel as it passes during its rotation a specified point. In the second type, the pins are fixed relative to the wheel, being in effect a solid integral part thereof and projecting from the periphery of the wheel throughout its entire periphery.

The present invention is related in a general way to this second type of pin wheel, but provides a means for simultaneously retracting all of the pins within the periphery of the wheel, or simultaneously projecting all of the pins therefrom. In certain applications pin wheels of the fixed pin type, i. e., a wheel wherein all of the pins simultaneously project from the periphery of the wheel, are quite satisfactory while using the positive pin type feeding means, but during certain intervals of use it is desirable to retract all of the pins within the periphery where they will be concealed and out of the way. Heretofore in applications requiring a movement of the pins to inoperative (non-feeding) positions it has been necessary to use the reciprocating pin type of pin wheel.

The present invention provides a positive pin type feeding device which has all of the advantages of a fixed pin type feeding device, and also the further advantage of a construction permitting the complete retraction of all the pins within the surface of the feeding device when it is desired to utilize other feeding devices.

Thus the object of the present invention is to simplify the construction as well as the means and mode of operation of a pin type feeding device as disclosed herein, whereby such devices may not only be economically manufactured but will be more efficient and satisfactory in use, adaptable to a wide variety of applications, having relatively few parts, and be unlikely to get out of repair.

A further object of the invention is to provide a pin type feeding device in which the pins are movably mounted so that they may be either extended or retracted relative to the surface of the feeding device.

2

A further object of the invention is to provide in a pin type feeding device of the character described, a simple and efficient means of simultaneously adjusting all of the individual pins from operative to inoperative position and vice versa.

A further object of the invention is to provide an oscillatory mounting for the individual pins.

A further object of the invention is to provide an oscillatory control member for simultaneously adjusting the pins upon their individual mountings.

A further object of the invention is to provide a pin type feeding device possessing the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein mentioned.

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.

Referring to the accompanying drawing, wherein is found the preferred but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a plan view of an assembled strip feeding device embodying the present invention;

Fig. 2 is a vertical sectional view of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a sectional view on line 4—4 of Fig. 2, showing the pins in inoperative position;

Fig. 5 is a plan view of an assembled strip feeding device embodying a slightly modified construction;

Fig. 6 is a cross sectional view on line 6—6 of Fig. 5;

Fig. 7 is a partially broken away cross sectional view on line 7—7 of Fig. 5;

Fig. 8 is a cross sectional view on line 8—8 of Fig. 5;

Fig. 9 is a vertical sectional view of the assembly shown in Fig. 5;

Fig. 10 is a cross sectional view on line 10—10 of Fig. 5; and

Fig. 11 is a fragmentary view partially broken away of the bottom of the assembly shown in Fig. 5.

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

Referring to the drawing, there is shown in Fig. 1 an assembled strip feeding device embodying the present invention. In this particular

form the strip feeding device comprising a pin carrying body 1 is mounted for axial adjustment longitudinally of a rotary supporting shaft 2, the body 1 being locked in adjusted position by a set screw 3. Although being longitudinally adjustable upon the shaft 2, the body 1 is locked thereto for unison rotary motion therewith by means of a key 4 engageable in opposed complementary portions of a keyway formed in both the body 1 and shaft 2. The key 2 is retained against axial movement relative to the assembly by the upturned flanges 5 at opposite ends thereof.

Pivotally mounted at equally spaced points upon the transverse face of the body 1 by pivot pins 6 are a plurality of oscillatory feeding pins 7. The pins 7 are capable of limited oscillatory motion from an upright position in which they extend outwardly from the periphery of the body 1 (Fig. 3) to an inclined position in which the pins are all retracted within the periphery of the body 1 (Fig. 4).

To control the pins 7 in their oscillatory movement and maintain them in adjusted position is a collar 8 having a series of equally spaced lugs 9 extending axially therefrom toward the pin supporting body 1. The spacing intermediate the lugs 9 is of such size as to permit the entry of a pin 7 therein. Thus, the individual pins 7 are each supported by the lugs 9 on opposite sides thereof, and by engagement with such lugs the positioning of the pin is controlled.

Collar 8 is supported for rotation upon draw nut 10 which has threaded engagement with an axially extending portion of the body 1 and bears not only upon the outer transverse face of collar 8, but also upon an interiorly projecting flange 11 of the collar 8.

To oscillate the pin from operative position (Fig. 3) to inoperative position (Fig. 4) it is only necessary to loosen the draw nut 10, and manually rotate the collar 8 a short distance thereby rocking the pins 7 upon their mounting studs 6. Rotary motion of the collar 8 is limited by engagement of the pins 7 with the lugs 9 on opposite sides of the pins as shown in Fig. 4. The collar 8 is locked in either operative or inoperative position by bringing draw nut 10 into engagement therewith, thereby clamping the collar intermediate the draw nut 10 and body 1 with which the lugs 9 are in contact.

Should the collar 8 be moved axially of the unit an excessive distance, the lugs 9 would be withdrawn from between the pins 7, thereby freeing the pins resulting in disarrangement thereof. To prevent this occurrence, the upturned flanges 5 of the key 4 are so spaced that the draw nut 10 cannot be loosened or moved axially of the unit a distance sufficient to permit withdrawal of the lugs 9 from between the pins 7. Before such excess motion of the collar 8 and lugs 9 can occur, the draw nut 10 comes into contact with the upturned flange 5 of the key 4, thereby limiting the axial movement of the draw nut.

Referring to Figs. 5 to 11, there is shown therein a slightly modified structure, which however embodies the same inventive concept heretofore described. In this form the pins are bodily movable relative to their mount rather than being mounted for simple oscillatory movement as in Figs. 1 to 4, inclusive.

Referring to Figs. 5 to 11, inclusive, the pin wheel unit comprises a mounting hub 15 keyed to a rotary supporting shaft 16. As clearly seen in Fig. 9, the hub 15 supports in fixed relation

therewith a guide collar 17, in the outer face of which is a series of angularly disposed guide slots 18 (Fig. 7).

The feeding pins 19 have a pair of studs 20—21 projecting from the shanks thereof in opposite directions (Fig. 9). The studs 20 extend within the guide slots 18 thereby controlling the path through which the pins 19 are moved. The oppositely directed studs 21 extend within an adjusting collar 22 rotatably mounted upon the longitudinally extending shank of hub 15. As will be understood from Figs. 7 and 9, movement of collar 22 causes a shifting of the bottom of the pins 19, thereby pushing the pins upwardly and outwardly, the pins being guided by studs 20 within slots 18, while the studs 21 pivot within collar 22.

The adjusting collar 22 has a plurality of recesses 23—24 in its radial face contiguous to a lock collar 25. The recesses 23 indicate operative position of the feeding pins 19, while recesses 24 are indicative of inoperative position of the feeding pins 19. Cooperating with the recesses 23—24 are a pair of spring biased plungers 26 carried by the lock collar 25 and extending therefrom for engagement within the pairs of recesses 23 or 24. Overthrow of the adjusting collar 22 is prevented by shoulders 27 located on opposite sides of each pair of recesses 23—24, the plungers 26 coming into engagement therewith should the collar be rotated too far.

Lock collar 25 is fixed on hub 15 by set screw 28 which passes through hub 15 into frictional engagement with the periphery of the rotary supporting shaft 16. Longitudinal movement of the pin wheel assembly along shaft 16 is thereby prevented. Relative rotary motion between the lock collar 25 and shaft 16 is prevented by key 29 held in place by set screw 30. As shown in Figs. 9 and 11, the inner end of key 29 is provided with a laterally extending projection 31 which overhangs the edge of the lock collar 25 thereby retaining the key in position. The adjusting collar 22 is recessed to clear the projection 31 (Fig. 11) which recess also serves as an overthrow limit for the adjusting collar.

The entire unit is assembled with the adjusting collar 22 under sufficient pressure to create some frictional resistance to idle or free rotation thereof. The plungers 26 of course add additional resistance to rotation of the collar 22, thereby insuring that the collar will not slip or rotate idly during operation of the pin wheel unit. To adjust the collar from operative to inoperative position or vice versa, a spanner wrench is utilized, notches 32 being provided in the periphery of the collar for engagement of the spanner wrench.

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 several modes of putting the invention into effect.

Having thus described my invention, I claim:

1. A pin type strip feeding device of the type wherein a series of feeding pins is adjustably mounted upon a carrier body for simultaneous movement into and out of operative position, including a carrier body, a plurality of feeding pins pivotally mounted thereon for limited oscillatory motion relative thereto, a rotary actuator for moving said pins relative to the carrier body, a series of projections thereon engageable with said pins to control the oscillatory motion of said pins relative to the carrier body, and a detent carried by said carrier body and engageable with the rotary actuator to maintain the actuator in adjusted position relative to the carrier body.

2. A pin type strip feeding device of the type wherein a series of feeding pins is adjustably mounted upon a carrier body for simultaneous movement into and out of operative position, including a pin supporting body, a plurality of oscillatory feeding pins pivotally mounted thereon for movement into and out of operative position, a rotary actuator therefor simultaneously engageable with said feeding pins and relative to which said pins have oscillatory movement, and motion limiting means determining the opposite limits of movement of said pins.

3. A pin type strip feeding device of the type wherein a series of feeding pins is adjustably mounted upon a carrier body for simultaneous movement into and out of operative position, including a pin supporting body, a plurality of oscillatory feeding pins pivotally mounted thereon for movement into and out of operative position, a rotary actuator therefor engageable with said feeding pins and relative to which said pins have oscillatory movement, and retaining means carried by said supporting body to maintain the actuator in adjusted position relative thereto.

4. A pin type strip feeding device of the type wherein a series of feeding pins is adjustably mounted upon a carrier body for simultaneous movement into and out of operative position, including a rotary pin supporting body, a plurality of fixed pivot pins longitudinally extending therefrom, a feeding pin pivotally supported upon each of said pivot pins for limited oscillatory motion relative thereto, the construction and arrangement being such that the feeding pins when extended in radial position project outwardly beyond the periphery of the body in operative position, and when oscillated thereon said feeding pins lie within the periphery of the body in inoperative position, an actuator for said pins comprising a collar freely supported upon said body for oscillatory motion relative thereto, a peripheral flange thereon extending axially of the supporting body, a series of spaced recesses in the radial face of said flange within each of which a feeding pin is positioned, the construction and arrangement being such that rotary motion of the actuator relative to the supporting body oscillates said feeding pins about their pivots from operative to inoperative position and vice versa, and means for maintaining the actuator in its adjusted position to thereby retain the feeding pins in operative or inoperative position.

5. A pin type strip feeding device wherein a series of feeding pins is adjustably mounted for simultaneous movement into and out of feeding position, including a supporting body, a plurality of feeding pins pivotally mounted therein for limited oscillatory motion relative thereto, an actuator for said pins adjustably mounted upon said supporting body for limited oscillatory motion relative thereto and operatively engaged with said pins to move said pins from operative to inoperative position and vice versa, a lock member adjustably carried by said supporting member and engageable with said actuator for maintaining said actuator in adjusted position, and motion limiting means for said lock member preventing disassembly of the feeding device.

6. A pin type strip feeding device wherein a series of feeding pins is adjustably mounted for simultaneous movement into and out of feeding position, including a rotary body, a plurality of feeding pins pivotally mounted thereon for limited oscillatory movement relative thereto, and an actuator rotatably carried by said body and common to the plurality of feeding pins, operative upon rotation thereof to simultaneously move said plurality of feeding pins from operative to inoperative position, and vice versa.

7. A pin type strip feeding device wherein a series of feeding pins is adjustably mounted for simultaneous movement into and out of feeding position, including a supporting body, a plurality of feeding pins pivotally mounted thereon for relative oscillatory movement, a collar adjustably carried by said supporting body for relative movement, said collar extending into surrounding relation with said pins to thereby support said pins and move said pins from operative to inoperative position and vice versa upon movement of said collar relative to the supporting body, and means for maintaining said collar in adjusted position to thereby retain the feeding pins in operative or inoperative position depending upon the position of said collar.

8. A pin type strip feeding device, wherein a series of feeding pins is adjustably mounted for simultaneous movement into and out of feeding position, including a supporting body, a plurality of feeding pins supported thereon for sliding and pivotal movement relative thereto, a plurality of guideways in said body for controlling the sliding movement of said pins, a pivot stud carried by each of said pins and engageable within one of said guideways, a collar adjustably carried by said supporting body for movement relative thereto, a plurality of studs carried thereby, the opposite ends of which are engageable with the feeding pins in offset relation with said pivot studs, the construction and arrangement being such that adjustment of the collar relative to the supporting body slides and oscillates said pins relative to said body to thereby place said pins in operative or inoperative position, and a spring biased detent carried by the supporting body engageable with said collar to limit its movement relative to said body.

9. A pin type strip feeding device wherein a series of feeding pins are adjustably mounted for simultaneous movement into and out of feeding position, including a pin supporting body, a plurality of substantially tangentially arranged guideways in a transverse face thereof, a plurality of individual feeding pins supported in said guideways for sliding and pivotal movement, and a collar adjustable relative to said supporting body with which said pins are engaged, adjustment of said collar relative to the supporting body causing simultaneous movement of said feeding pins into and out of feeding position.

10. A pin type strip feeding device wherein a series of feeding pins are adjustably mounted for simultaneous movement into and out of feeding position, including a pin supporting body, a plu-

rality of feeding pins freely supported thereby for combined sliding and oscillatory movement relative thereto, and a common actuator for said pins engageable therewith to simultaneously actuate said pins from operative to inoperative position and vice versa through a combined sliding and oscillatory motion relative to said supporting body.

11. A pin type strip feeding device wherein a series of feeding pins are adjustably mounted for simultaneous movement into and out of feeding position, including a pin supporting body, a collar carried thereby for movement relative thereto, and a plurality of feeding pins pivotally supported by both the body and collar at relatively spaced points, the construction and arrangement being such that the pins are simultaneously moved from operative to inoperative position and vice versa by oscillatory motion about their respective pivot points upon movement of the collar relative to the body.

12. A pin type strip feeding device wherein a series of feeding pins are adjustably mounted for simultaneous movement into and out of feeding position, including a plurality of pivotally mounted feeding pins, a two-part support therefor, one of said parts being movable relative to the other, and a pivotal connection between said pins and each part of the two-part support.

13. A pin type strip feeding device wherein a series of feeding pins are adjustably mounted for simultaneous movement into and out of feeding position, including a plurality of pivotally mounted feeding pins, a two-part support therefor, one of said parts being movable relative to the other, a pivotal connection between said pins and one of said support parts, and a sliding pivotal connection between said pins and the other support part, said pivotal connections being offset one relative to the other.

14. A rotary pin type strip feeding device wherein a series of feeding pins are adjustably mounted for simultaneous movement into and out of operative position, a mounting therefor including a portion thereof movable relative to the remainder thereof, a plurality of feeding pins carried thereby each pin being pivotally connected with the mounting and with the movable portion thereof, the two pivot points for each pin being offset radially of the strip feeding

device, and means for actuating the movable portion of the mounting a predetermined extent including an indexing and locking mechanism operative to locate and maintain the movable portion in predetermined position, the opposite limits of movement thereof representing operative and inoperative position of the feeding pins.

15. A pin type strip feeding device wherein a series of feeding pins is adjustably mounted for simultaneous movement of all of the pins into and out of feeding position, including a rotary body, a plurality of feeding pins mounted on one side face of said body, each of said pins being pivotally connected at one end to said body and adjustable about such pivot to a radial position wherein the opposite end thereof projects beyond the periphery of said body, and a rotary actuator in side by side relation to said body and engaging all of said pins simultaneously at points intermediate their ends, said actuator being rotatably adjustable between one position setting said pins to radial positions and another position tilting said pins to a non-radial position.

16. A pin type strip feeding device wherein a series of feeding pins is adjustably mounted for simultaneous movement of all of the pins into and out of feeding position, including a rotary shaft, a pin body mounted on said shaft for unison rotary motion therewith, an actuator member in side by side relation to said pin body and mounted thereon for relative rotary motion, means for locking said actuator to said pin body in selected positions of rotary adjustment relative thereto, and feeding pins arranged selectively to project from and be withdrawn into the area between said pin body and said actuator, said pins at longitudinally spaced points along the lengths thereof being pivotally connected to said pin body and operatively engaged with said actuator member.

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