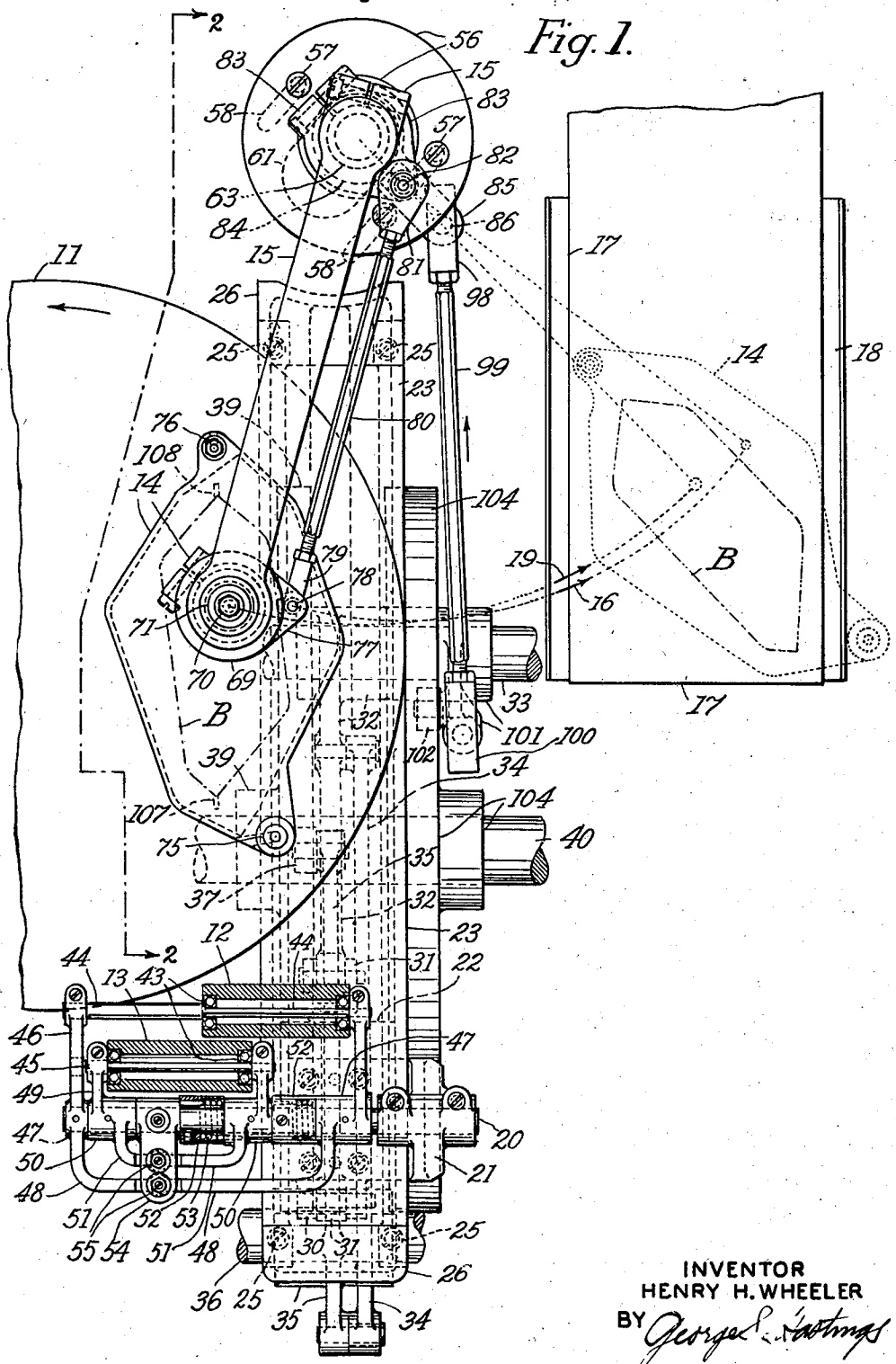
Aug. 22, 1944. H. H. WHEELER 2,356,637

BINDER TRANSFER MECHANISM

Original Filed Dec. 3, 1938 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

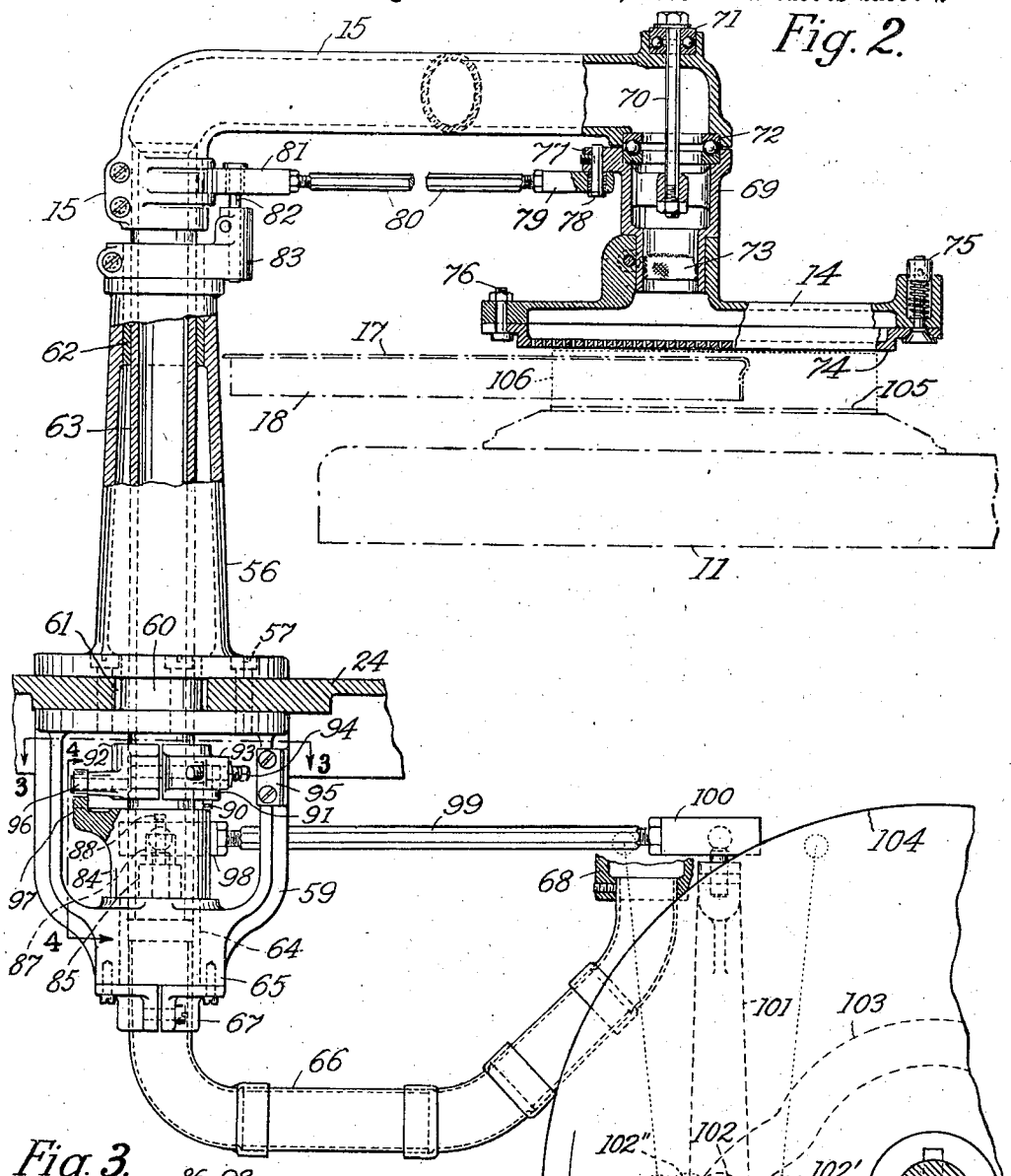


Fig. 3.

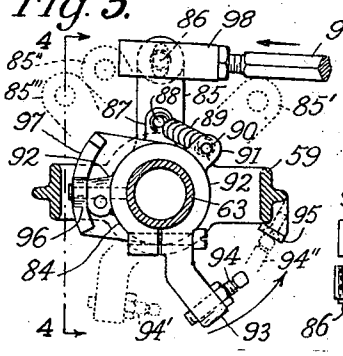
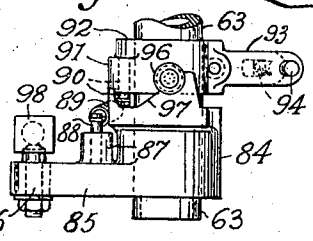


Fig. 4.



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BINDER TRANSFER MECHANISM

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Original application December 3, 1938, Serial No. 243,799. Divided and this application November 14, 1941, Serial No. 419,129

6 Claims. (Cl. 131—105)

This invention relates to binder transfer mechanisms for cigar machines, its main object being to provide improved binder transfer means, and the present application constitutes a division of my co-pending application Serial Number 243,799, filed December 3, 1938, on which Patent No. 2,287,004 was issued June 16, 1942.

The binder transfer construction is similar to that shown in my co-pending application Serial No. 183,405, filed January 5, 1938, on which Patent No. 2,316,828 was issued April 20, 1943, to have its head move in a horizontal plane in transferring a cut binder from the cutting die to the rolling apron, and is associated with a duplex die turret which makes a half turn after each die has been served and dwells while the cutter rolls sweep across the die. When a binder is to be transferred from one of the dies, the transfer head is positioned above the cutting station of the dies, the binder is raised into contact with the transfer head and held by suction thereon as the head oscillates in a horizontal plane to a position a small distance above the rolling apron. When located in proper position over the apron, the transfer head descends and the suction is cut off, thereby depositing the binder on the apron. Thereupon the transfer head is again raised sufficiently to clear the apron and swung back to receiving position. Still another object of the invention is to provide for adjustment of the binder transfer to permit the binder to be deposited in the proper position on the bunch rolling apron.

A further object is to increase the speed at which binders may be transferred from the binder die turret to the bunch rolling table, thereby permitting the attainment of the maximum speed of binder cutting with the die turret and the operation of the bunch rolling table at the maximum speed. It will be noted that with the binder transfers heretofore in use the binder transfer head thereof has a parallel motion in an arcuate path extending over 180 degrees from the die to the table, whereas the movement of the present binder transfer has only approximately a 45 degree arc. Thus the interval allotted for the transferring of the binder is greatly reduced and the operation of the machine speeded up. Moreover the binder die may be placed close to the rolling table and the necessary floor space and the size of the machine is reduced.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same or like parts:

Fig. 1 is a plan view of the improved mechanism, showing the cutter rolls at starting position and the binder transfer in receiving position, ready to convey the binder to the rolling apron;

Fig. 2 is a side elevation, partly in cross-section, on line 2—2 of Fig. 1, showing the improved binder transfer means with its operating mechanism;

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

Fig. 4 is a detail end elevation on line 4—4 of Fig. 2.

Referring to Fig. 1, the binder leaf is served by an operator to one of the dies of an intermittently revolving duplex die turret 11, such as disclosed in my above mentioned Patent No. 2,316,828. After having made one-half revolution, the turret dwells and the binder B is cut from the served leaf by the rectilinear movement of the rollers 12, 13 across the die 105. Upon the return of the cutting rollers into initial position, the die head 106 (Fig. 2) ascends with the cut binder into contact with the bottom face of the suction head 14 of the binder transfer 15, which at that time is in receiving position above the die. At the moment of contact, the suction in the die head is cut off and suction in the transfer is turned on, thus transferring the binder from the die to the transfer head and holding it thereon while the same is moved along the path 16 to its delivery position above the apron 17 of the rolling table 18. The head is turned during this movement to assume the desired oblique position on the rolling apron, as indicated by the path 19 of the wrist pin 78 connecting the transfer head to the connecting rod 80 of bracket 83.

The binder cutting rolls 12, 13 are supported from a stud 20 (Figure 1) carried by a bracket 21 attached to a slide 22. The slide 22 is supported within a hollow rail 23 extending underneath the die turret head 11 and fastened to the bed 24 of the cigar machine by screws 25. The ends of the rail 23 are closed by cap pieces 26 and the slide 22 is provided with a recess communicating with an oil groove for lubrication of the bearing surfaces. The slide 22 has lugs 30 in which is pivoted a link 31 connected to an arm 32 fulcrumed on a shaft 33 in the base of the machine. The arm 32 is connected by a link 34 with a bell crank 35 fulcrumed on a shaft 36 and having a roller 37 in engagement with the track of a cam 39 mounted on the cam shaft 40 of the machine.

As the cam 39 revolves in the counterclockwise direction, the roller 37 moves upwardly to a position whereby the bell crank 35 is swung upwardly and thereby through link 34 turning the arm 32

forwardly and thus moving slide 22 with bracket 21 and rolls 12, 13 across the die turret 11.

The ball bearings 43 of cutting rollers 12, 13 (Fig. 1) are mounted on shafts 44, 45. The shaft 44 is clamped at each end in a bracket 46, having bearings 47 mounted on stud 20 and connected by a bridge arm 48, thereby providing a box formation which imparts rigidity to the same; and the shaft 45 is similarly supported by a bracket 49 having bearings 50 mounted on stud 20 and connected by an arm 51. Between the bearings of each of the brackets 46 and 49 there are adjustably fastened on stud 20 collars 52 having hollow ends enclosing torsion springs 53 anchored at one end to the collar 52 and at the other to the adjoining bearing of the respective bracket. Between the collar 52 and the non-tensioned bearing 50 of bracket 49, there is fastened to stud 20 an arm 54 carrying stop screws 55 bearing on the bridge arms 48 and 51. By turning the said screws 55, the collars 52 and thus the height of the rollers 12, 13 and their tension against the die can be precisely adjusted to varying conditions of operation. The construction of the shafts 44, 45 and the manner in which they are supported, forms the subject matter of my co-pending application Serial No. 419,130, filed November 14, 1941, on which Patent No. 2,343,946 was issued and which is a division of my above-mentioned application Serial No. 243,799 on which Patent No. 2,287,004 was issued.

The binder transfer is mounted on a hollow column 56 adjustably secured to the bed 24 by screws 57 passing through elongated slots 58 in the latter and fastening to the underside of the bed a bracket 59 having an upwardly extending hub portion 60 projecting through an oval slot 61 in the bed into the base of the column 56. Projecting from and free to turn in a bushing 62 in the upper end of column 56 is a vertical tube 63 which extends down through the hub 60 into a bushing 64 in a downwardly projecting yoke 65 of bracket 59. Into the lower end of bushing 64 is fitted a tube 66 held in place by a clamp 67 and connected to a suction chamber 68 in the bed of the machine, the tube 66 being provided with joints permitting expansion thereof as the column 56 is adjusted to a greater distance from the binder die.

To the top end of tube 63 is clamped a hollow transfer arm 15, which at its free end carries the neck 69 of a suction head 14, the neck 69 being free to turn on and secured on arm 15 by a bolt 70 having its head mounted in the ball bearing 71 and threaded into an internal lug of the neck 69 to hold the same against the ball bearing 72 of the arm 15. A screen 73 inserted into the lower end of neck 69 prevents leaf particles from being sucked into the transfer arm. The perforated suction plate 74 of suction head 14 is made readily detachable for cleaning by providing it with slotted lugs engageable with the depressible cone head of a spring-pressed bolt 75 at one end and with a fixed flat head of a bolt 76 at the other.

The neck 69 has a crank extension 77 carrying a crank pin 78 engaging with a socket 79 at one end of a connecting rod 80, the other end of which has a socket 81 pivoted to a pin 82 fastened in a bracket 83 clamped to bushing 62 in column 56. The connecting rod 80 is so adjusted that the suction head 14 is turned to the desired angle as the arm 15 carries it into position above the rolling apron 17.

A sleeve 84 resting on the lower hub portion 65 of yoke 59 is loosely mounted on tube 63, this sleeve having an arm 85 carrying a ball-headed-pin 86 adjustable in a slot at its free end (Figs. 3 and 4). A boss 87 of arm 85 supports a post 88 on which is anchored a spring 89 attached to a post 90 in a boss 91 of a sleeve 92 clamped to tube 63, the sleeve 92 having an arm 93 carrying at its free end an adjustable stop screw 94 arranged to encounter a stop plate 95 attached to bracket 59. The clamp sleeve 92 has a lug on which is rotatably mounted a roller 96 which is held against a shoulder formed on this lug and shown in dotted lines in Fig. 4, and roller 96 rests on a cam piece 97 extending upwardly from the loose sleeve 84. This cam piece is shaped to permit movement of the roller 96 from an upper to a lower position, or vice versa, as relative swinging motion between the sleeves 84 and 92 takes place. The cam piece 97 has upward projections at the ends, providing positive stops for the roller 96 on reaching either level, thus preventing undue stress on spring 89 by moving the operating parts when the machine is not in operation.

On the ball-headed-pin 86 is pivoted the socket 98 of a connecting rod 99, the other end of which has a ball-and-socket joint 100 pivoted to a cam lever 101 fulcrumed on shaft 33 and having a roller 102 in engagement with a track 103 of a cam 104 on cam shaft 40. As the roller 102 is displaced by cam 104 from position 102' to position 102'', the arm 85 of the loose sleeve 84 is moved from position 85' to 85'', carrying with it, by the upward projection adjacent the high portion of cam piece 97 and shown engaging roller 96 in Figs. 3 and 4, the clamp sleeve 92, and thus turning the tube 63 and with it the transfer arm 15 from binder receiving position above the binder die. In position 85'' of arm 85, the stop screw 94, having moved from position 94' to 94'', engages with stop plate 95, thus arresting the clamp sleeve 92 so that the further displacement of cam roller 102 from position 102'' to 102''' causes the loose sleeve to move alone from position 85'' to 85''' against the pressure of spring 89, thereby turning the cam piece 97 and causing the roller 96 to descend to its lower level. The tube 63 having been held in its upper or turning position by the resting of roller 96 on the high point of cam piece 97, the transfer arm 15 will therefore drop, bringing the suction head 14 into contact with rolling apron 17. By now cutting off the suction in head 14 and turning on suction in rolling table 18 through mechanism of well known construction, the binder is transferred from the former to the latter. The transfer arm 15 then returns to its starting position for the next binder, being in transit raised to its upper position by the return motion of cam piece 97 due to spring 89 as the cam 104 brings roller 102 back into position 102' on the return stroke of cam lever 101.

The relative vertical positions of the binder transfer and the rolling table and binder die are shown in Fig. 2. In the receiving position the cut binder is raised by the die head 106 above the cutting edge of the die to the suction plate 74, and in the delivery position it is lowered on to the rolling apron 17.

The various adjustments described above are necessary to compensate for the varying distances of the vertical axis of the neck of different suction heads from the tube 63 due to the different locations of the neck in various suction heads. It is necessary to maintain the suction head in

a predetermined relation to the binder die which is supported in a predetermined position with its striking points 107, 108 in predetermined relation to the path of the cutting rollers. Hence the screws 57 are unfastened and the column 56 is adjusted to move the suction head into the proper position above the binder die, and the throw or angular displacement of the suction head is regulated to cause it to assume the desired position above the rolling table.

What is claimed is:

1. A binder transfer comprising a hollow member swingable about a vertical axis, a perforated transfer head mounted on said member and communicating with the interior thereof, means for applying suction to said member to suctionally retain a binder on the perforated portion of said head, mechanism for turning said member about said vertical axis to carry said suction head from binder-receiving position to a position overlying a bunch rolling table, said mechanism being adjustable to vary the extent of turning movement of said member, and means for immediately lowering said member after it has reached the limit of the turning movement to which said mechanism has been adjusted.

2. A binder transfer comprising a hollow member swingable about a vertical axis, a perforated transfer head mounted on said member and communicating with the interior thereof, means for applying suction to said member to suctionally retain a binder on the perforated portion of said head, mechanism for turning said member about said vertical axis to carry said suction head from binder-receiving position to a position overlying a bunch rolling table, and means for immediately lowering said member after it has reached a position overlying the bunch rolling table, said mechanism including an arm loosely mounted on said member, a cam lever for actuating said arm, said lever being connected to said arm, a collar fastened on said member and yieldingly connected to said arm for movement therewith and an abutment arranged to limit the movement of said collar and thereby stop the transfer head in a position overlying the bunch rolling table, and said lowering means including a cam piece on said arm engaging said collar and normally supporting said head at the level of its binder-receiving position and permitting said member to descend and lower said head to the bunch rolling table upon the relative motion of said arm and collar following the engagement of the latter with said abutment.

3. A binder transfer comprising a hollow member connected to a source of suction and pivoted on a vertical axis, a perforated hollow suction head pivotally mounted on said member and adapted to turn horizontally thereon and communicating with the interior of said member, whereby the perforated portion of the suction head is adapted to suctionally retain a binder thereon, means for horizontally turning said member to carry said head from binder-receiving position above a binder cutting die to a delivery position above a bunch rolling table, and mechanism for turning said head relatively to said member while it is in transit from the binder die to the bunch rolling table, the pivot of said member being adjustable toward and away from the binder die, and said means and mechanism being adjustable to cause said head to assume a predetermined position at receiving position above the binder die and at delivery position above the bunch rolling table.

4. A binder transfer comprising a hollow member connected to a source of suction and pivoted on a vertical axis, a perforated hollow suction head pivotally mounted on said member and adapted to turn horizontally thereon and communicating with the interior of said member, whereby the perforated portion of the suction head is adapted to suctionally retain a binder thereon, means for horizontally turning said member to carry said head from binder-receiving position above a binder cutting die to a delivery position above a bunch rolling table, and mechanism for turning said head relatively to said member while it is in transit from the binder die to the bunch rolling table to cause said head to turn the binder to a position at said delivery position which is at an oblique angle to the position of the binder on the binder die, said mechanism being adjustable to vary the delivery position of the binder above the bunch rolling table.

5. A binder transfer comprising a hollow member swingable about a vertical axis, a perforated suction head having a vertical neck mounted on said member and adapted to turn horizontally thereon and communicating with the interior of said member, said member being adjustable toward and away from the binder receiving position of said head to compensate for different locations of the vertical axis of the neck of various suction heads, means for applying suction to said member to cause the perforated portion of the suction head to suctionally retain a binder thereon, mechanism for turning said member about its vertical axis and lowering said member vertically to bring said suction head into binder delivering position, and means for turning said suction head horizontally while it is in transit, said turning means being adjustable to compensate for the adjustment of said member for different locations of the vertical axis of the neck of various suction heads and permit the binder to be deposited in a predetermined position.

6. A binder transfer comprising a hollow member connected to a source of suction, and pivoted on a vertical axis, a perforated hollow suction head pivotally mounted on said member and adapted to turn horizontally thereon and communicating with the interior of said member, whereby the perforated portion of the suction head is adapted to suctionally retain a binder thereon, means for horizontally turning said member to carry said head from binder-receiving position above a binder cutting die to a delivery position above a bunch rolling table, mechanism for turning said head relatively to said member while it is in transit from the binder die to the bunch rolling table to cause said head to turn the binder to a predetermined position above the bunch rolling table, and means for lowering said suction head to deposit the binder upon the bunch rolling table, said mechanism being adjustable to vary the position to which the binder is turned by said head above the bunch rolling table and thereby vary the position in which the binder is deposited upon the table.

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