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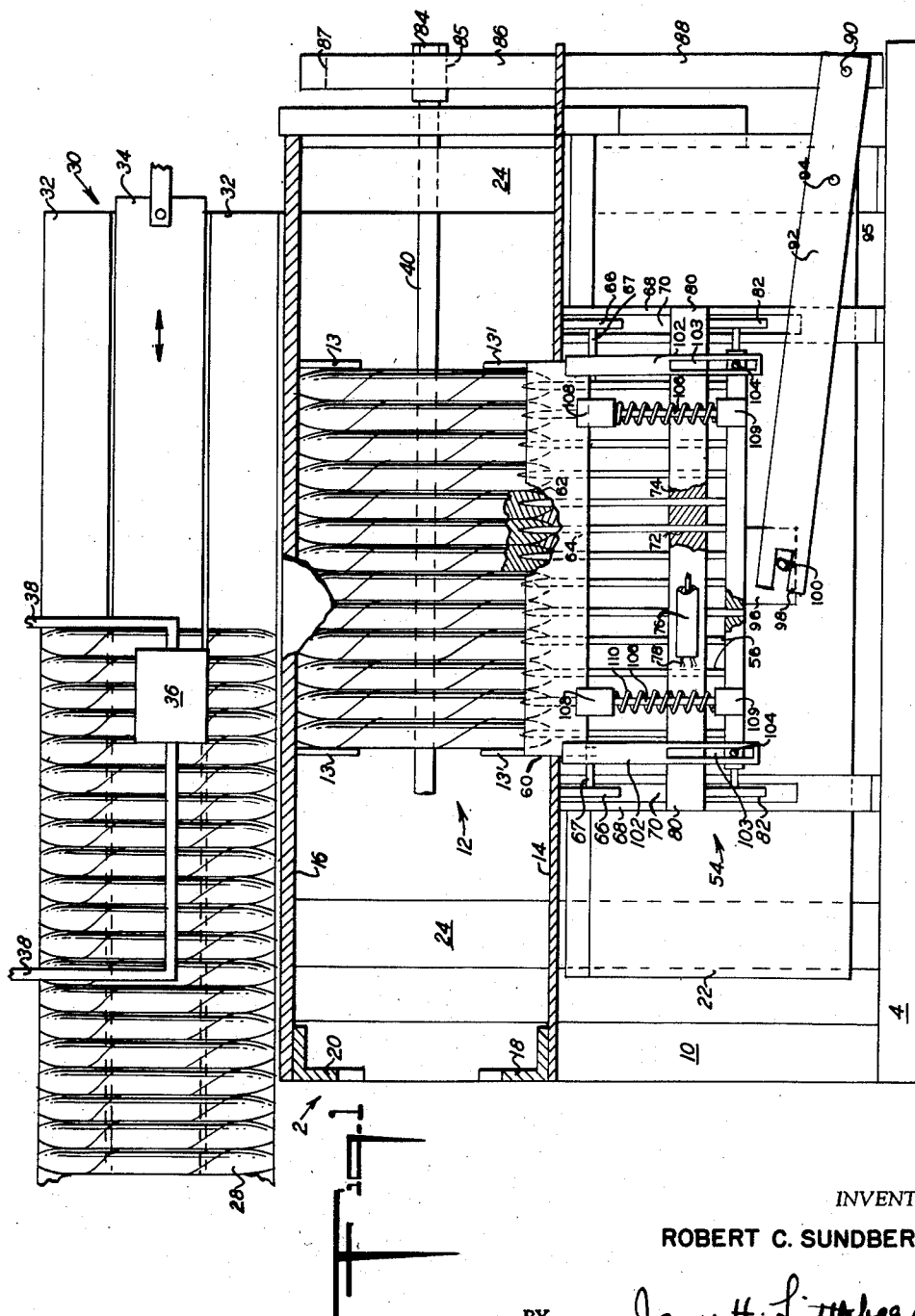
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2,800,133

CIGAR HEAD PUNCHER ATTACHMENT

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4 Sheets-Sheet 1



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CIGAR HEAD PUNCHER ATTACHMENT

4 Sheets-Sheet 2



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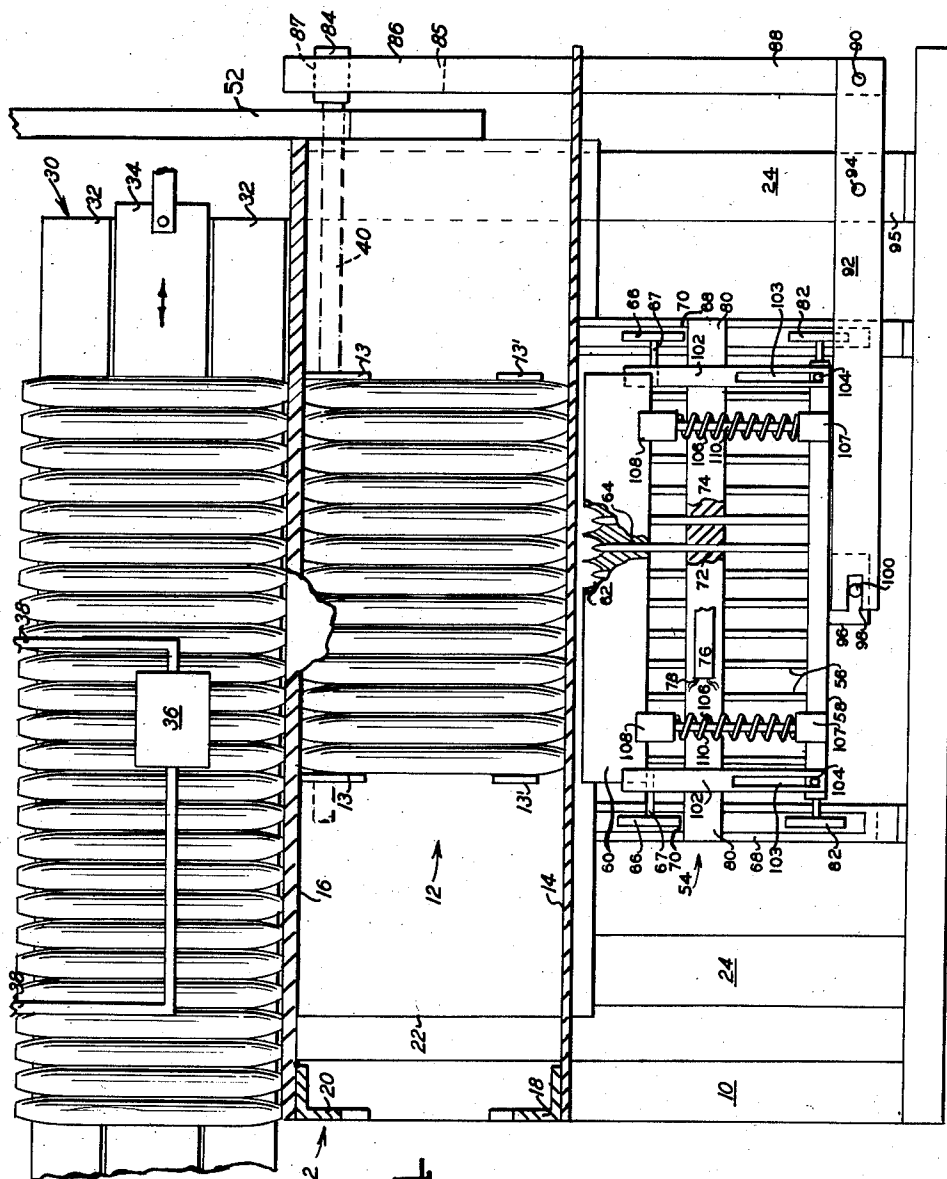
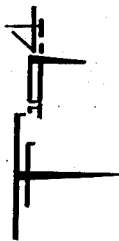
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CIGAR HEAD PUNCHER ATTACHMENT

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3 Claims. (Cl. 131—254)

This invention relates to head punchers for cigars and, more particularly, to a head punching attachment for the hopper of an unstacking feeder for a cellophane wrapping machine.

In typical manufacture, cigars are conveyed in dummy boxes from the making machines to their unstacking feeder of a cellophane wrapping machine. The new cigars are uniformly oriented, and arranged in horizontal rows in the dummy boxes, each row consisting, for instance, of thirteen cigars is supported on a spacer, and the spacer-supported rows are stacked in an open-top hopper. The cigars are unstacked, one row at a time, by an ejector plate which advances across the bottom of the hopper and engages the heads of the cigars so as to push them, in the axial direction of the cigars, from the bottom of the hopper laterally onto a horizontal conveyor moving at right angles to the ejector plate motion and towards the wrapping machine. As the bottom row is ejected, the spacer which, up to that time, supported the bottom row drops to a collecting bin below the hopper. The ejector plate then retracts from beneath the hopper, and the cigars and spacers in the hopper descend so that the theretofore penultimate row becomes the bottom row. In order to eject the cigars to form a substantially continuous row on the laterally traveling horizontal conveyor, the advancing motion of the ejector plate must be fairly rapid, and a dwell for a substantial period occurs between ejections. The object of this invention is to provide a row of heated needles for piercing the heads of the cigars in a row near the bottom of the hopper during the dwell period of the ejector plate, and during parts of the advancing and retracting motions of the ejector plate.

Various hot needles head punchers have been used in the prior art, they generally include apertured sockets for engaging and holding the heads of cigars and needles moving through the socket apertures so as to pierce the cigar heads held therein. The needles should be maintained at a temperature below that which would char the tobacco, but sufficiently high to prevent tearing of the wrappers at the cigar heads, and to provide well-ironed holes in the cigar heads. The longer the needles stay in the cigar heads, the smoother will be the surfaces of the tobacco surrounding the perforations when the needles are withdrawn.

Heretofore, in combining a head puncher with an unstacking feeder, the advancing plate motion has been utilized for advancing the needles into a row of cigars in the hopper. However when the needles are moved by the ejector plate, and even though the ejector plate drives the needles with lost-motion so that the needles rest in the cigars for most of the interval during which the ejector plate is advanced, considerable time during which the needles should rest in the cigars is lost because the needles withdrawn from the cigars during the entire retracted dwell of the ejector plate and, hence, the entire retracted dwell period of the ejector plate motion is lost. The object now is to provide in the combination of a bottom-

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ejecting unstacking hopper and a hot needle cigar head puncher, the improvement which comprises a drive for the head puncher independent of the hopper ejector motion of the hopper so that the needles rest in the cigars for the maximum time during each cycle of operation. More particularly, it is intended by this invention to provide a hot needle advancing and retracting mechanism actuated through a lost-motion linkage and system by a main power shaft of a bottom unstacker, and synchronized so that the needles are withdrawn from head punching position for an interval only slightly longer than is necessary to allow the punched row of cigars to descend, and to locate and penetrate the next succeeding row. By this improvement it is possible to hold the needles in the cigars at least fifteen times as long a time as was possible when the needles were advanced and retracted by the ejector plate. There is thus provided a smoother punched hole in the cigar head, and needles heated below the charring temperature of tobacco may be used.

These and other objects will be apparent from the following specification and drawings, in which:

Fig. 1 is a plan view of the bottom unstacking conveyor of a Colton-Voice cellophane machine, showing the head-punching attachment, with the hopper and parts of the attachment partially broken away to illustrate the details in horizontal cross-section and showing the needles in a row of cigars near the end of the retracted dwell of the ejector plate;

Fig. 2 is a side elevation of the mechanism as illustrated in Fig. 1;

Fig. 3 is a view similar to Fig. 2, showing the needles still in during the advancing motion of the ejector plate;

Fig. 4 is a view similar to Fig. 1, but showing the needles retracted coincident with the final advancing motion of the ejector plate; and,

Fig. 5 is a diagram illustrating the operating cycle of the invention as compared with the prior art.

Referring now to the drawings in which like reference numerals denote similar elements, the invention is in combination with the bottom unstacker, denoted generally at 2, of a Colton-Voice cigar banding and wrapping machine. Machines of this type are shown in U. S. Patents 1,905,728, issued April 25, 1933; 1,964,640, issued June 26, 1934; and 2,044,947, issued June 23, 1936. It will be understood that in the ordinary operation of the bottom unstacker, the bottommost cigars in hopper 12 are ejected onto conveyor 30 and thence fed to wrapping and banding apparatus, not shown. Bottom unstacker 2 includes a front end frame plate 4, rear end supports 6, and front-to-rear frame members 8 and 10. These, along with other chassis elements, support a hopper 12 which includes side guides 13, 13' and front and rear walls 14, 16, respectively supported as at 18 and 20 on the frame. The lower edges of the front and rear walls are spaced above the adjacent machine parts to provide a passageway through which an ejector plate 22 slides horizontally, from front to rear, the ejector plate being supported on slideways 24 rigid with the frame. Ejector plate 22, when it advances towards the rear of the machine, engages the heads 26 of cigars 28 and pushes a bottom row rearwardly from the bottom of hopper 12 onto a conveyor 30. The details of conveyor 30, which include fixed strips 32 and an active strip 34, are not important to the subject invention, other than that it be understood that, as active strip 34 works in orbit, the cigars resting on the conveyor are moved to the left, step by step. Feeler roller 36 pivotally supported on rods 38 rests on the cigars which have been ejected onto conveyor 30 and, whenever the cigars have progressed sufficiently far to the left as seen in Figs. 1 and 4 to clear the back of the hopper, feeler roller 36

drops downwardly. Ejector plate 22 which is normally retracted to the position shown in Fig. 1, rapidly advances across the bottom of hopper 12 to push another row of cigars onto conveyor 30. Disposed below the plane of ejector plate 22 is a drive shaft 40 which is actuated by gearing under the control of field roller 36 so as to roll towards the rear of the assembly from the position shown in Fig. 1 to the position shown in Fig. 4. When positioned as in Fig. 1, shaft 40 supports a trap door 42, diagrammed in dotted lines in Figs. 2 and 3, in closed position, and when shaft 40 moves to the position shown in Fig. 4, trap door 42 swings downwardly about a pivotal support 44 so as to discard the bottommost spacer 46 on which the then ejected row of cigars was previously supported. In addition to operating the spacer discard mechanism, shaft 40, by its motion from front to rear, and return, also drives ejector plate 22. A pinion 48 on the end of the shaft 40 rolls along a fixed rack 50 rigidly supported on frame member 8. Engaging the upper side of pinion 48 is a rack bar 52 fixed to ejector plate 22 so that as shaft 40 moves towards the rear from its Fig. 1 position, pinion 48, rolling on fixed rack bar 50, drives the upper rack bar 52 from the position shown in Figs. 1 and 2 towards the rear of the machine, a position of intermediate movement being shown in Fig. 3 and its final rearward position being shown in Fig. 4. The advancing and retracting motions of shaft 40 and the corresponding advancing and retracting motion of ejector plate 22 are comparatively fast. As soon as feeler roller 36 drops downwardly from the position shown in Fig. 2 to the position shown in Fig. 3, shaft 40 immediately moves from front to rear and returns, this motion requiring at the most but approximately two seconds.

Referring momentarily to the upper line of the Fig. 5 diagram, it will be observed that the ejector plate drive motion is such that the drive shaft 40 rapidly advances to eject the bottom row of cigars, immediately retracts and then there is a comparatively long period of retracted dwell between ejection cycles, the dwell corresponding to the length of time required for conveyor 30 to move an ejected row of some 13 cigars clear of the path of the next succeeding row. Figs. 1 and 2 show the condition when conveyor 30 has partially moved the most recently rejected row of cigars to the left, and ejector plate 22 is in its position of retracted dwell. Fig. 2 shows the action of the mechanism after the last of recently ejected cigars has passed beneath feeler roller 36; roller 36 has dropped downwardly, drive shaft 40 is moving to the right, as seen in Fig. 2, and towards the rear as seen in Figs. 1 and 4; ejector plate 22 has engaged the heads 26 of cigars 28 and is pushing the latter onto conveyor 30. As the cigars are ejected further onto conveyor 30, they raise feeler roller 36 and as soon as drive shaft 40 has advanced to the position shown in Fig. 4, it immediately returns to the position shown in Figs. 1 and 2 and, in so doing, retracts ejector plate 22 to its position of dwell illustrated in Figs. 1 and 2.

In known prior art, both patented and unpatented, head punching devices have been driven by an ejector plate so that as the plate advances to eject a bottom row of cigars, hot needles are inserted in the heads of a superior row in the hopper and, as the ejector plate retracts, the needles are thereby withdrawn. The prior art needle motions are diagrammed on the middle line of Fig. 5, it being noteworthy that when the needles move with the ejector plate, they can remain in the cigars only for a comparatively short time, the needles then dwelling in retracted position for the entire time the ejector plate dwells in retracted position. According to the invention, a head puncher is arranged, in combination with the bottom unstacker, so that the hot needles remain in the heads of a row of cigars for the entire time the ejector plate dwells in retracted position, and for part of the advancing motion of the ejector plate. Thus, by devising

the needle motion so that it is independent of the plate motion, the heated needles remain in the cigars for a much longer time, a smoother punched hole can be obtained with heat well below the charring temperature of the tobacco.

Referring first to Figs. 1 and 2, the head puncher denoted generally at 54 comprises a horizontal row of heated needles 56 spaced to enter the heads 26 of cigars 28, the rear ends of needles 56 being fixed as indicated at 57 in a needle bar 58. The forward portions of needles 56 slide through passages 64 in a locator bar 60, needle passages 64 terminating in sockets 62 spaced along the side of locator bar 60 so as to engage around the heads 26 of the third row above the bottommost of cigars 28. A slot 65 is provided in the front wall 14 of hopper 12 so that locator bar 60 may advance into hopper 12 sufficiently to engage sockets 62 over the cigar heads as illustrated in Fig. 2. Locator bar rolls on wheels 66 mounted on axle 67 at each end of the locator bar, and the wheels move in a slotted wheel guideway 68 supported at its ends by hopper wall 14 and frame plate 4. Strips 70 affixed beneath the guideway 78 rollingly support the wheels.

Between needle bar 58 and locator bar 60, needles 56 slide through passages 72 in a heater bar 74 on which are supported suitable heaters, fragmentarily illustrated at 76 and connected as at 78 to a suitable source of electricity. Bar 74 is affixed at its ends 80 on guideway 68 and, being hot, transmits heat to the needles which pass therethrough so that the latter, upon entering the cigar heads 26, not only punch a hole therein, but also, because of their heat, iron a smooth surface in the tobacco surrounding the punched hole. The ends of needle bar 58 are supported by wheels 82 which roll on supporting strips 70 on guideway 68.

Head puncher 54 is actuated by drive shaft 40 through a roller 84 on the outboard end of shaft 40, the latter moving with lost motion between the ends 85 and 87 of a yoke 86. Yoke 86 is connected via bar 88 and pivot 90 to a lever 92 pivoted at 94 on a support 95 affixed to the front plate 4. The free end of lever 92 has a fork 98 bracketing a pin 100 supported on a block 96 affixed on needle bar 58.

When drive shaft 40 nears the end of its retracting motion (approaching its position in Figs. 1 and 2), roller 84 engages the end 85 of yoke 86 so as to drive the latter to the position shown in Fig. 1, thus to advance the inboard end of lever 92, thereby correspondingly advancing needle bar 58 and driving needles 56 into the cigar heads 26. When drive shaft 40 advances towards its Fig. 4 position, there is, for considerable length of its travel, lost motion between roller 84 and yoke 86. However, as drive shaft 40 nears the end of its advancing motion, roller 84 engages the end 87 of yoke 86, thereby advancing bar 88 to the position shown in Fig. 4 so as to pivot lever 92 counterclockwise, thus moving its inboard end to the position shown in Fig. 4 so as to retract needle bar 58 the needles 56 affixed thereon.

A lost motion coupling is provided between the needle bar 58 and locator bar 60. Slotted links 102 affixed on and extending rearwardly from the locator bar 60 have slots 103 in which pins 104 extending upwardly from needle bar 58 engage so that, after needle bar 58 has started its retracting motion, pins 104 engage links at the ends of slots 103, thereby retracting locator bar 60. Locator bar 60 is resiliently extended from the position shown in Fig. 4 towards Fig. 1 position by compression springs 110' engaged between abutments 108 on locator bar 60 and abutments 109 on needle bar 58, the springs 110' being positioned around push rods 106 affixed on abutments 109 and slidably engaging through passages in abutments 108 on locator bar 60. The resilient drive through compression springs 110 cushions the advancing

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motion of locator bar 60 to permit the cigar heads to nestle into sockets 62.

The advantage in thus reversely advancing and retracting heated needles 56 by the final parts of the retracting and advancing motions of drive shaft 40 may be ascertained by comparing of the lower line of Fig. 5 with the intermediate line. According to this invention, the needles remain in the cigars for almost the entire dwell-advance-retract cycle of drive shaft 40, whereas heretofore most of the entire cycle was wasted. Since the quality of the work depends largely on the length of time the needles can be left in the cigar heads, superior results accrue.

I claim:

1. In a bottom unstacker for cigars, including a hopper for receiving superimposed cigars; a reciprocating ejector plate normally dwelling in a first position outside the hopper, said plate being mounted for advancing and retracting motions across the bottom of the hopper to and from a second position to eject the bottommost of the cigars from the hopper; a reciprocating drive member normally dwelling in a first position and cyclically rapidly advancing to and retracting from a second position, a head puncher including needle means and means for heating the same, said needle means being reciprocable from a first position outside the hopper to a cigar head penetrating position within the hopper; gearing connecting said member and said plate whereby the advancing movement of said drive member from said first to said second positions and retraction of the same to said first position correspondingly advances and retracts said plate; and a lost motion coupling between the drive member and said needle means, said lost-motion coupling operating independently of said plate and gearing and including a first abutment engaged by said drive member during the latter portion of the retracting motion of the drive member for advancing said needle means to cigar head penetrating position and a second abutment spaced from the first and engaged by said drive member during the latter portion of the advancing motion of the drive member for retracting the needle means to said first position, whereby said needle means dwells in head penetrating position during the time said drive member dwells in said first position and for part of the time during which said drive member advances to said second position.

2. In a bottom unstacker for cigars, including a hopper for receiving superimposed cigars; a reciprocating ejector plate normally dwelling outside the hopper, said plate being mounted for advancing and retracting motions across the bottom of the hopper to eject the bottommost

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of the cigars from the hopper; a reciprocating drive member normally dwelling in a first position and cyclically rapidly advancing to and retracting from a second position; a head puncher including needle means and means for heating the same, said needle means being reciprocable from an inoperative position to a cigar head penetrating position within the hopper, gearing connecting said member and said plate whereby the advancing and retraction movements of the same to said first position correspondingly advance and retract said plate; and a coupling between the drive member and said needle means, said coupling operating independently of said plate and gearing and including means responsive to the latter portion of the retracting motion of the drive member for advancing said needle means to cigar head penetrating position, and means responsive to the latter portion of the advancing motion of the drive member for retracting the needle means to said first position, whereby said needle means dwells in head penetrating position during the time said drive member dwells in said first position and for part of the time during which said drive member advances to said second position.

3. In a bottom unstacker for cigars, including a hopper for receiving superimposed cigars; a reciprocating ejector plate normally dwelling in a first position outside the hopper, said plate being mounted for advancing and retracting motions across the bottom of the hopper to eject the bottommost of the cigars from the hopper; a reciprocating drive member normally dwelling in a first position and cyclically rapidly advancing and retracting to and from a second position; a head puncher including needle means and means for heating the same, said needle means being reciprocable from an inoperative position to and from a cigar head penetrating position within the hopper, gearing connecting said member and said plate whereby the advancing and retracting movements of said drive member correspondingly advance and retract said plate; and drive means coupling the drive member and said needle means for reversely actuating the latter, the retracting motion of the drive member thus advancing said needle means to cigar head penetrating position and the advancing motion of the drive member thus retracting the needle means to said inoperative position, whereby said needle means dwells in head penetrating position while said drive member dwells in said first position.

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