Nov. 20, 1934. R. E. RUNDELL 1,981,469

CIGAR BUNCH FORMING

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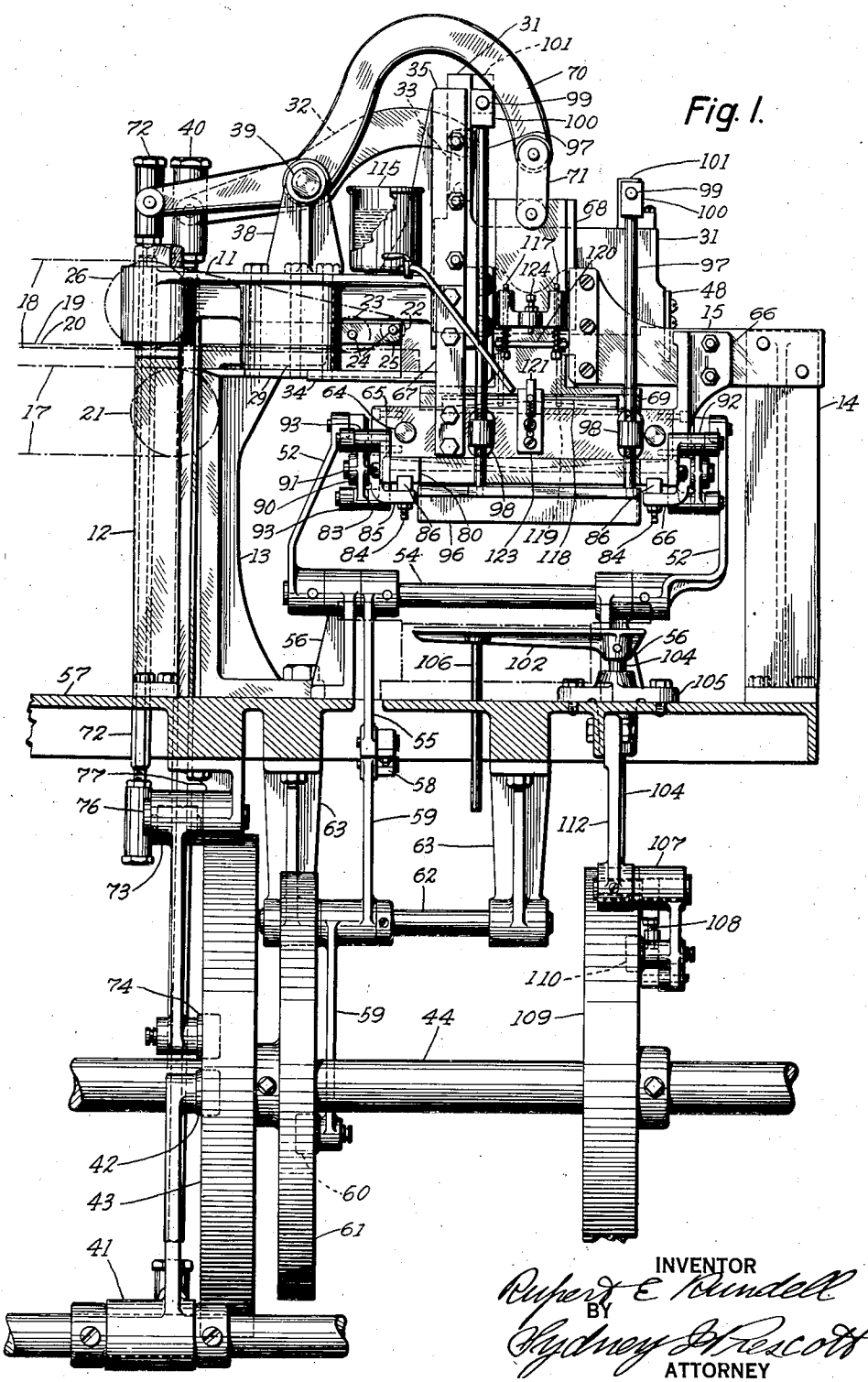


Fig. 1.

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Fig. 5.

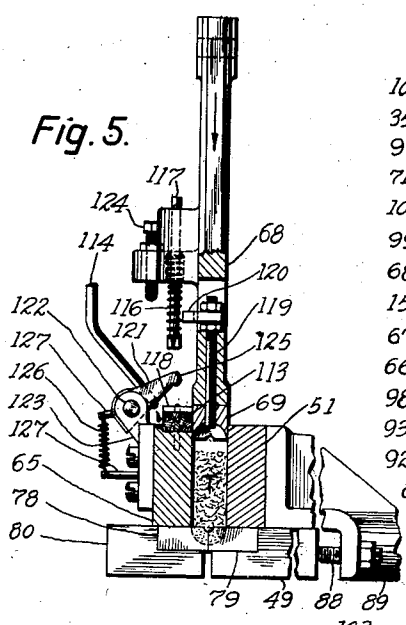
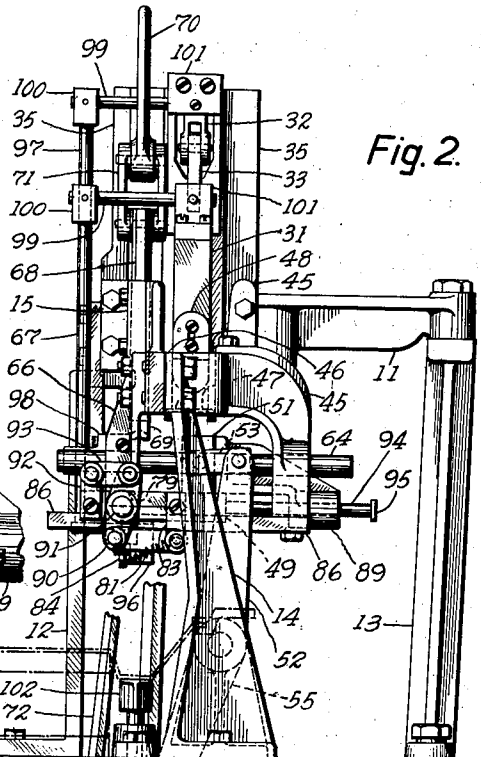


Fig. 2.



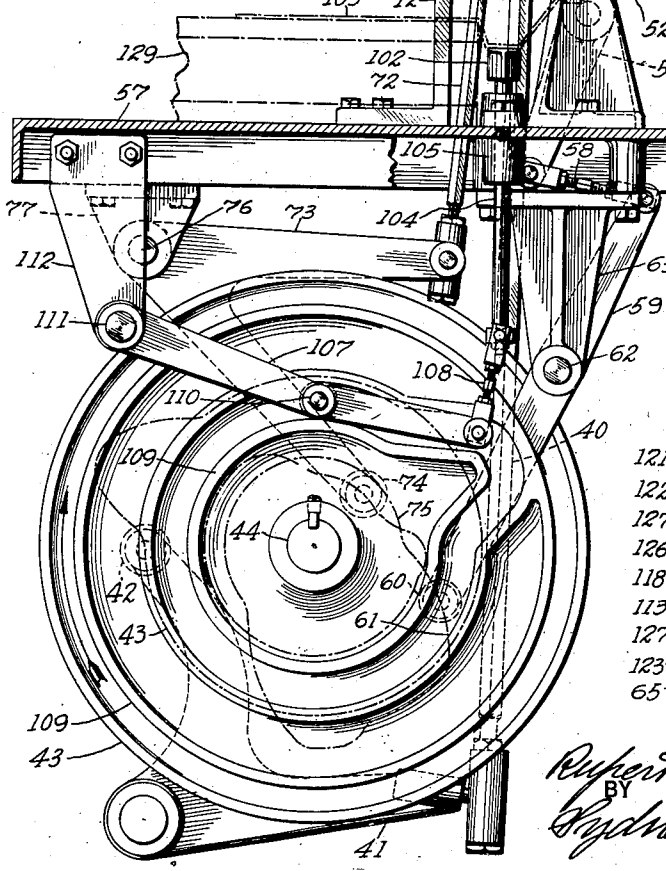
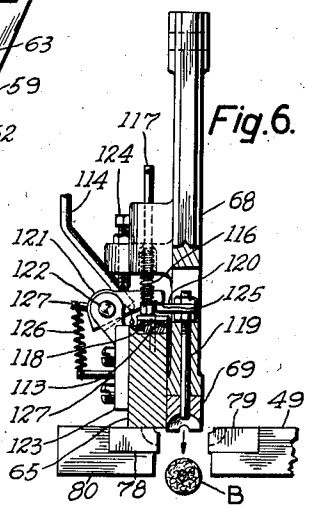


Fig. 6.



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Fig. 3.

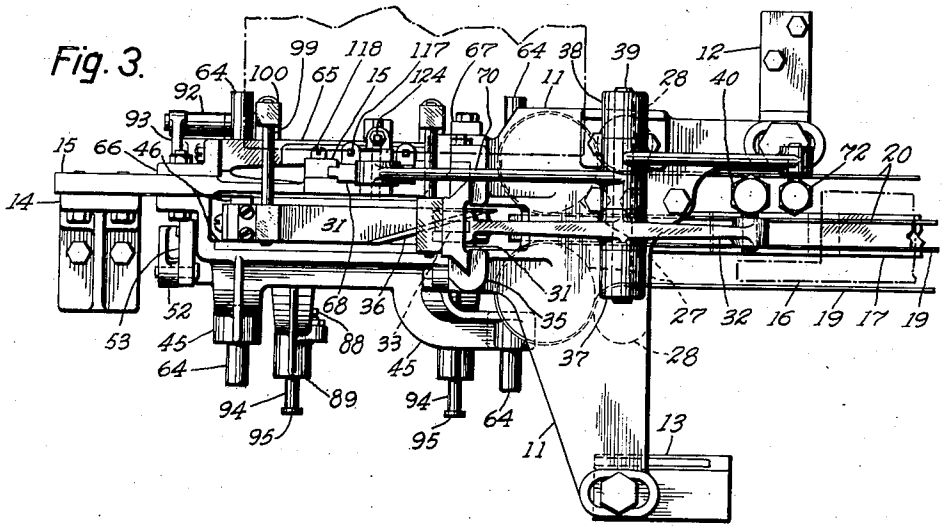
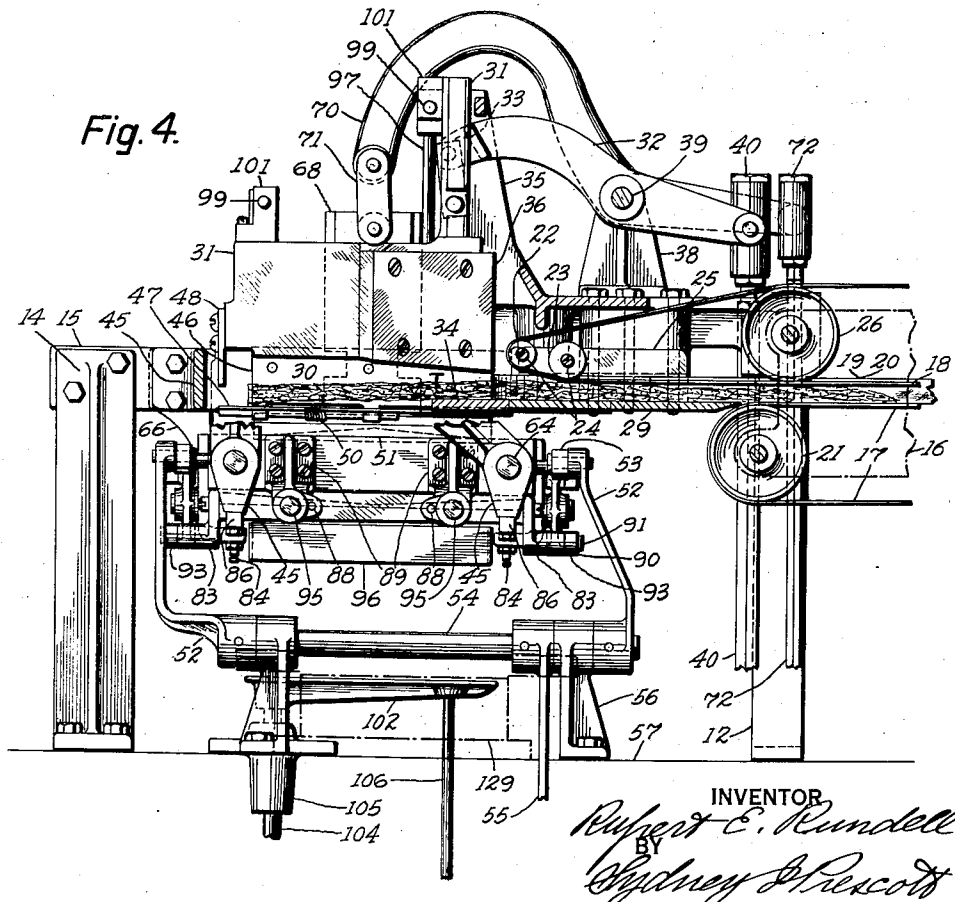


Fig. 4.



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Fig.7.

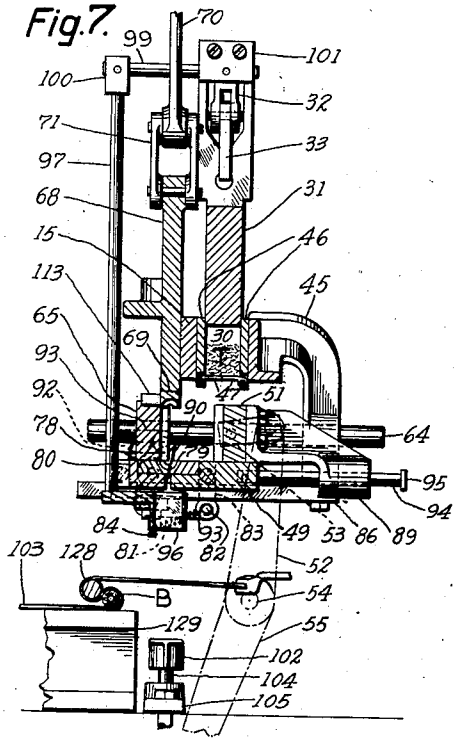


Fig.8.

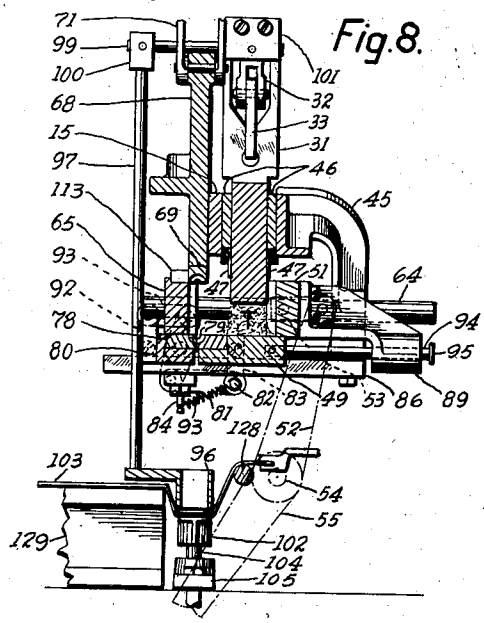


Fig.9.

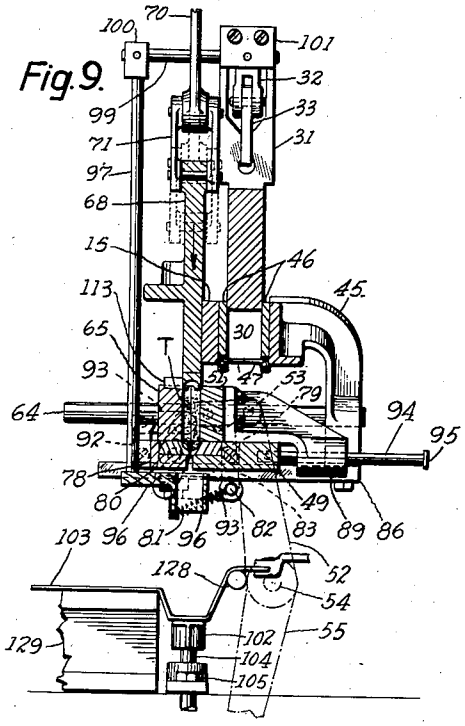
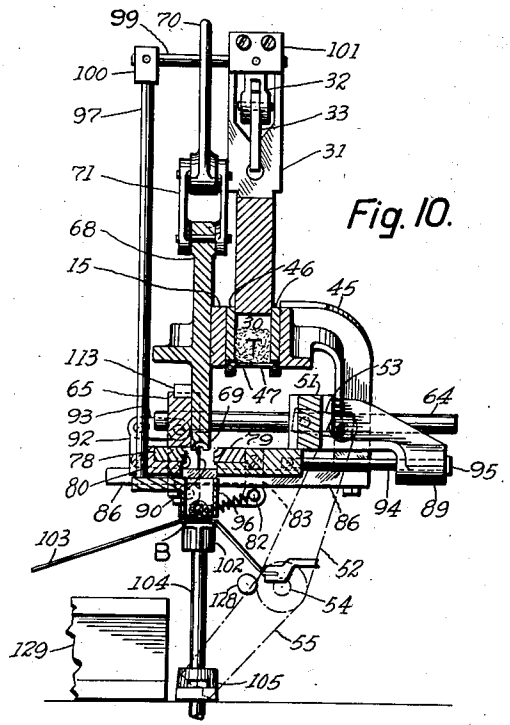


Fig. 10.



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UNITED STATES PATENT OFFICE

1,981,469

CIGAR BUNCH FORMING

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Application October 22, 1930, Serial No. 490,516

13 Claims. (Cl. 131—5)

This invention relates to cigar bunch forming and particularly to a method and apparatus for making bunches which is especially suited to the making of cigars of the Toscani type, with the general object of providing an improved machine for this purpose, although many of the features of this method and apparatus are applicable to other types of cigars as will be apparent from what follows.

For the above purpose it is one object of the invention to provide a method and apparatus for permanently forming the charge of filler tobacco, prior to the enclosing of the same in a binder or wrapper. This is of importance because the Toscani cigars as well as many other types are tapered toward each end and are circular in cross section. When the rolling belt in which charges are originally enclosed in a binder is relied on to shape the charge, the strain on the belt has been found to be such that the belt rapidly stretches and wears to the extent that it becomes useless and must be frequently replaced. To the end of avoiding this it is also an object of the invention to provide charge shaping mechanism which forms the charge to final permanent cigar form on all sides and full length instead of at the ends only or on two or three sides only as has generally been the case in prior devices.

Shaping full length results in transfer difficulties since bunches have heretofore been transferred by gripping a charge at an open space at the middle of the charge between shaping members acting on the ends only of the cigar. To overcome this difficulty and also to make the shaper practical for very moist or sticky tobacco such as commonly used for Toscani cigars it is one of the principal objects of the invention to produce a shaper which is self stripping and which also by action of its own shaping parts, self ejecting. For this purpose the shaper parts acting on one side of the cigar and embracing that path of the cigar are parted and the shaper part acting on the other half of the cigar is given a motion which ejects the charge between the separated shaper parts. Since the shaper parts are separated along a straight line at right angles to the charge compressing movement of the other shaper part, that part holds the charge in the middle while the separated parts are automatically stripped away from it.

Another feature of the invention is the construction of the charge shaping mechanism so that it will work satisfactorily on quite loose or quite moist or even semi-liquid material. Thus relatively movable confining walls are provided for first reducing the width of the charge to a width approximately equal to that of the cigar to be formed and confine the charge in the range of action of the shapers which then while the charge is still confined compress it to the final shape of the desired cigar. Thus it is an object of the invention to confine the charge against squeezing out from between the main shaper parts. Still another object is to provide for transferring tobacco materials such as above mentioned satisfactorily by ejecting it from the bottom of a filler charge separating compartment into the shaper and then positively ejecting the charge downwardly from the shaper into the Chianti belt or other binder applying means.

While the term "charge" is often used to refer only to filler before it is bound into a bunch, the present invention is by no means applicable only to a loose charge but may be used to shape an unformed charge whether or not said charge is surrounded by a binder and accordingly as used in the claims a charge refers either to an unbound charge or a charge which consists of a filler surrounded by some sort of a binder, unless otherwise specified.

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

In the accompanying drawings in which like characters of reference indicate the same or like parts and which form a part of this specification, Fig. 1 is a side elevation of a Toscani cigar machine constructed in accordance with the invention; Fig. 2 is an end elevation partly broken away of the mechanism shown in Fig. 1; Fig. 3 is a plan view of the machine shown in Figs. 1 and 2; Fig. 4 is a detail side elevation partly in section and partly broken away of certain mechanism shown in Figs. 1 and 2; Figs. 5 and 6 are detail sectional side elevation of parts shown in Figs. 1 and 2; Figs. 7 to 10 are sectional end elevations of parts shown in Figs. 1 and 2 and illustrating the several steps in the operation performed by the machine in forming the bunch.

In carrying the invention to effect there is provided a filler feeding device, means for enclosing a charge of filler within a binder of the usual type and mechanism between said device and said means for giving the charge permanent cigar form before it is enclosed within this binder, so that when bound or wrapped the bunch or cigar formed will be of cigar shape without relying on the binding or wrapping means or a

later shaping operation to produce the final cigar shape. In the best constructions said mechanism includes a form for shaping one side of the charge, a second form for shaping the other side of the charge and means cooperating with said forms to receive a charge of tobacco which may be of a loose or semi-liquid character and confine it in the range of action of the forms as the forms compress the charge into desired shape. Preferably the lower of said forms is separable into two parts and means is provided for giving the plunger a further movement after the parts are separated to eject the shaped charge into the means for enclosing the charge in a binder or wrapper.

The method employed in carrying the invention into effect consists in depositing sufficient filler for one charge on a table then confining the filler at two opposite sides in a space of approximately cigar width and then while the charge is still confined within said space compressing and shaping the confined filler at its other two sides. Preferably the space in which the filler is confined at two opposite sides is of cigar shaped cross section.

The various means and steps referred to may be varied widely within the scope of the claims for those particular ones selected to illustrate the invention are but one of many possible concrete embodiments of the same. The invention therefore is not to be restricted to the precise details of the structure shown and described.

Referring to Figs. 1 to 4, the charge forming mechanism is mounted on a base 11 which is supported from the machine bed by pedestals 12, 13 and 14, the latter being attached to the side of base 11 by a long bracket 15. The filler feed shown in Figs. 3 and 4 is mounted on the base 11 and the bracket 16 of the cigar machine.

A narrow stream of filler tobacco T is fed by hand into the channel formed by a horizontal bottom belt 17, a top belt 18, and vertical side belts 19 and 20. The bottom belt 17 is guided by a pulley 21 and other pulleys not shown, supported by the bracket 16. The top belt 18 is guided by pulleys 22 and 23 mounted on studs 24 attached to the base 11 by a bracket 25, and by a pulley 26 and other pulleys not shown carried in bracket 16. The side belts 19 and 20 run over pulleys 27 and 28 mounted on the base 11 and over other pulleys not shown. Filler tobacco T is advanced in the form of a continuous narrow stream by the feed belts and on its forward motion is supported by the bottom plate 29.

On entering the cutting chamber 30, the stream of filler is separated into charge lengths by the filler cutoff unit. This unit consists of the base 11, a vertical slide 31, an operating lever 32 attached to the slide by means of the link 33, and a stationary ledger plate 34 fixed to the base 11. The base 11 supports slideways 35 for the knife slide 31 carrying the cutter blade 36, and also supports brackets 37 and 38 supporting the shaft 39 on which the operating lever 32 is fulcrumed. The lever 32 is actuated by an adjustable rod 40 connected to a cam lever 41 which, by means of a roller 42, engages with a cam 43 mounted on the shaft 44 of the cigar machine.

To the slideways 35 are attached brackets 15 and 45 which support vertical strips 46, forming a continuation of the filler feed side belts 19 and 20, and also forming the walls of a chamber of which the horizontal gates 47 form the bottom.

The sliding plunger 31 which pushes the charge through the bottom of the chamber carries an adjustable plate 48 which engages with and opens the gates 47 as the knife 36 descends, depositing the separated charge on the table 49, the torsion springs 50 closing the gates 47 as the knife ascends and lifts the plate 48.

For the purpose of giving the charge permanent form, and as illustrated permanent full formed cigar shape, the charge is pushed sideways along the table into the range of action of shaping mechanism by a movable confining wall of cigar shaped contour operated by levers 52 attached to both sides of wall 51 by means of the links 53. These operating levers 52 are pivotally mounted on a shaft 54 having lever arm 55, said shaft being supported by brackets 56 on bed 57 of the cigar machine. The lever arm 55 is actuated by an adjustable rod 58 joined to a cam lever 59 engaging, by means of a roller 60, with a cam 61 on the shaft 44 of the cigar machine. The cam lever 59 is mounted on a shaft 62 in brackets 63 projecting from bed 57. The movable confining wall 51 is guided so as to slide along the table 49 by the rods 64 held in its ends and sliding in holes in bracket 45 at one side and in holes in the stationary confining wall 65 at the other. This confining wall 65, like the opposite movable confining wall 51 is of cigar shaped contour so that when the latter wall is at its inner position filler is confined in a space the width of the desired cigar and of cigar shaped cross-section. The wall 65 is supported by a bracket 66 attached to one side of bracket 15, and by a bracket 67 fastened to the side of the base 11.

After having confined the filler charge as above described, the movable wall 51 continues to confine the charge during the operation of the shaping form or plunger 68, and in its rest position also serves as a guide for the motion of the upper form 69 which is of half cigar shape and is also of cigar shaped cross-section to fit the space between the walls 51 and 65.

The charge shaping is performed by the upper and the lower shaping forms. The upper form 69 is attached to the plunger 68 which is actuated by an operating lever 70 by means of a link 71, the lever 70 being controlled by an adjustable rod 72 which is connected with a cam lever 73 having a roller 74 engaging a cam 75. The lever 73 is fulcrumed on a stud 76 on a bracket 77.

The lower form is split longitudinally in two parts 78 and 79 to form separable mold parts which are supported by the sliding tables 80 and 49, respectively, and urged together by springs 81 extending between studs 82 of brackets 83 attached to sides of sliding table 49 and studs 84 screwed into stationary brackets 66 and 85. Sliding tables 49 and 80 are supported on one side by a sliding bar 86 extending between the brackets 45 and 66, and on the other side by a bar 87 extending between the brackets 45 and 85.

In charge compressing and shaping position, the lower form parts 78 and 79 are positively held in place by two adjusting screws 88 projecting from the brackets 89 attached to the movable shaper form 51 in such a manner that, when the form is in the closed position, the screws 88 engage with the sliding table 49, thereby pushing the parts 78 and 79 together, as shown in Fig. 5. The parts 78 and 79 have a simultaneous motion which is produced by the movement of crank levers 90 which are mounted on studs 91 and are supported on both sides of the sliding tables 49 and 80 by the stationary brackets 66 and 85, and are attached to brackets 83 and 92 by means of the connecting links 93.

The opening of the lower shaper parts 78 and 79 is effected by the sliding table 49, having extension rods 94, which are provided with heads 95 at their ends, passing through holes drilled horizontally in the brackets 89 of the movable shaper jaw 51 so that, when the latter moves outward, the brackets 89 slide on the rods 94 until they engage the heads 95 and pull the mold table 49 with them, thereby opening the parts 78 and 79 and permitting the shaped charge B to be ejected, by further movement of the plunger shaper 68, into the positioning cage 96 from which it finally reaches the rolling table.

The cage 96, which retains the charge in desired position upon the Chianti belt or rolling apron while being transferred to the rolling table, is actuated from the slide 31 by means of vertical rods 97 which pass through guides 98 and which are connected with horizontal rods 99 by connecting heads 100, the rods 99 being supported by a block 101 attached to the slide 31.

When a formed charge B has been ejected into the cage 96, a transfer arm 102 elevates the rolling apron 103 into close proximity to the cage whereupon the charge falls on the rolling apron which then moves downward, followed by the cage, until the arm 102 has reached its lowermost position, when the charge caught in the bight of the cage 96, which cage is reset by the slide 31. Arm 102 is mounted upon the upper end of the rod 104 sliding in a bracket 105 mounted on the bed 57. The rod 104 is prevented from turning by a guide rod 106 attached to the arm 102 and sliding through a hole in the bed 57. The lower end of the rod 104 is connected with a cam lever 107 by a rod 108 and actuated from a cam 109 by means of a roller 110 mounted on the lever 107 which is fulcrumed on the stud 111 supported by the bracket 112 from bed 57.

The improved machine is provided with a moistening mechanism, which prevents the charge from sticking in the molds during the shape forming operation. For this purpose, the charge forming unit is provided, upon the stationary wall 65, with a sponge 113 which is moistened by water flowing down a pipe 114 connected to a waterpot 115 attached to a base 11. Figs. 5 and 6 show the arrangement of the moistener mechanism as combined with the charge stripping unit. The plunger 68 carries the compression springs 116 which press down the pins 117 upon the sponge top plate 118 when they are engaged in the lower position of plunger 68.

The charge releasing unit consists of the stripper pins 119 connected to each other by the plate 120 and held in place by their weight, and of the stripper cam 121 mounted on shaft 122 supported by the bracket 123 projecting from the stationary wall 65. When the plunger 68 moves downward, it carries the adjustable stop-screw 124 into engagement with the stripper cam 121 at the time when the stripper plate 120 arrives under the tip 125 of a cam 121, the latter pushing the stripper plate down whereby the charge is stripped from the upper shaper 69. When the plunger 68 then goes up, the stripper cam is reset by a spring 126 extending between the studs 127.

In Figs. 7 to 10 the parts are shown in their four main positions. The operation is as follows: The filler tobacco T, Fig. 7, in the cutting chamber 30 is held in place by the gates 47 until the knife 36 has separated from the narrow tobacco strip of filler, a charge length, which charge length then is pushed down by the plunger 31 upon the table 49, as shown in Fig. 8. As soon as the table 49 receives the charge, the movable confining wall 51 pushes towards the opposed confining wall and under the mold 69. These walls act on the loose charge to confine it transversely in a cigar width space, which is of cigar cross-section because of the contour of the wall faces. Arriving at the position shown in Fig. 9, the charge T is pressed into full formed cigar shape between the shaper forms 51 and 65 by the plunger 68. Following this movement, the lower shaper parts 78 and 79 are pulled apart, and the shaped charge B is released by the stripping pins 119 and falls into the positioning cage 96 on the portion of the rolling apron 103 which lies over the transfer arm 102, as shown in Fig. 10. The transfer arm 102 then moves downward, followed by the positioning cage 96 which, on reaching its lowermost position, is given a rapid upward movement so that the bight forming roller 128 can come into action, rolling the charge on the rolling table 129. The charge by this time having the required tapered shape, the rolling apron in the case of the Toscani cigar illustrated is only required to fit the paste covered binder tightly around the same, instead of squeezing an unshaped charge into shape while binding it, as it was required to do heretofore.

What is claimed is:

1. The combination with a filler feeding device, of means for enclosing a charge of filler within a binder, and mechanism between said device and said means for giving the charge permanent cigar form before it is enclosed within its binder including members having surfaces with the contour of a cigar with tapered ends, said device including a compartment above said mechanism for receiving a bunch charge, said compartment having a gate forming its bottom and a plunger operating to push the charge through the bottom of the compartment into said mechanism.

2. The combination with a filler feeding device, of means for enclosing a charge of filler within a binder, and mechanism between said device and said means for giving the charge permanent cigar form before it is enclosed within its binder, said mechanism including complemental charge shaping forms including one form for shaping one side of the charge and a pair of forms cooperating to shape the other side of the charge, means for moving the one form and the pair of forms together to compress and shape the charge between them, and means for moving each form of said pair sidewise relative to the line of compressing movement to separate the pair of forms and automatically strip the charge therefrom.

3. The combination with a filler feeding device, of means for enclosing a charge of filler within a binder, and mechanism between said device and said means for giving the charge permanent cigar form before it is enclosed within its binder, said mechanism comprising separable charge shaping forms, a shaping plunger movable toward the forms to compress the charge, and means for separating the forms and giving the plunger a further movement to eject the shaped charge into said means.

4. Charge shaping means for cigar machines, comprising a form for shaping one side of the charge, a second form for shaping the other side of the charge, mechanism for moving said forms toward and away from each other to compress and shape the charge, means cooperating with said forms to receive the charge and confine it in the range of action of said forms, one of said

forms being longitudinally split in two parts, and means for separating the parts sidewise relative to the direction of compressing action of the other form to automatically strip the charge from said parts.

5. Charge shaping means for cigar machines, comprising a form for shaping one side of the charge, a second form for shaping the other side of the charge, mechanism for moving said forms toward and away from each other to compress and shape the charge, means cooperating with said forms to receive the charge and confine it in the range of action of said forms, one of said forms being longitudinally split into two parts, and means for separating the parts and giving added movement to other form to eject the charge between the separated parts.

6. Charge shaping mechanism for cigar machines comprising complemental charge shaping forms for operating on the charge including one form constructed to embrace and shape one half of the charge, and a pair of forms arranged to act together to embrace and shape the other half of the charge, means for moving the forms to compress and shape the charge, and means for reciprocating each form of said pair along straight line paths in a transverse direction relative to the direction of compressing movement to successively separate the pair of forms and automatically strip the charge therefrom.

7. In a cigar machine, the combination with mechanism for giving a charge of tobacco permanent form, of means for supplying a narrow stream of filler tobacco, a compartment having a gate in its bottom in alignment with the forward end of said stream, devices for separating a charge in said compartment from the stream, and means for moving the charge through the bottom of said compartment into said mechanism.

8. In a cigar machine, the combination with mechanism for giving a charge of tobacco permanent form, of means for supplying a narrow stream of filler tobacco, a compartment having a gate in its bottom in alignment with the forward end of said stream, devices for separating a charge in said compartment from the stream, and means for moving the charge through the bottom of said compartment into said mechanism, means for applying a wrapper or binder to the charge, said mechanism including devices for ejecting the shaped charge directly into the applying means.

9. In a cigar machine, the combination with means for applying a binder to a charge of tobacco, of three shaping forms having relative coacting movement to compress and shape a charge between them, and means for separating two of said forms and giving an added movement to the other of said forms to eject the charge into said means.

10. In a cigar machine, the combination with means for applying a binder to a charge of tobacco, of three shaping forms having relative coacting movement to compress and shape a charge between them, means for separating two of said forms and giving an added movement to the other of said forms to eject the charge into said binder applying means, and stripping elements mounted on the other ejecting form for movement into the form to strip the bunch therefrom.

11. In a cigar machine, the combination with means for applying a binder to a charge of tobacco, of three shaping forms having relative coacting movement to compress and shape a charge between them, means for separating two of said forms and giving an added movement to the other of said forms to eject the charge into said means, and moistening devices for moistening the shaping surfaces of said forms.

12. In a cigar machine, the combination with means for applying a binder to a charge of tobacco, of three shaping forms having relative coacting movement to compress and shape a charge between them, means for separating two of said forms and giving an added movement to the other of said forms to eject the charge into said means, said applying means including a Chianti belt toward which the charge is ejected, means for forming a bight in the Chianti belt about said charge, and a positioning device for maintaining the charge in a predetermined position relative to the Chianti belt until the bight is formed.

13. In a cigar machine, the combination with means for applying a binder to a charge of tobacco, of three shaping forms having relative coacting movement to compress and shape a charge between them, and means for separating two of said forms and giving an added movement to the other of said forms to eject the charge into said means, said shaping forms having cigar length shaping surfaces to shape the full length of the charge.

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