

June 25, 1935.

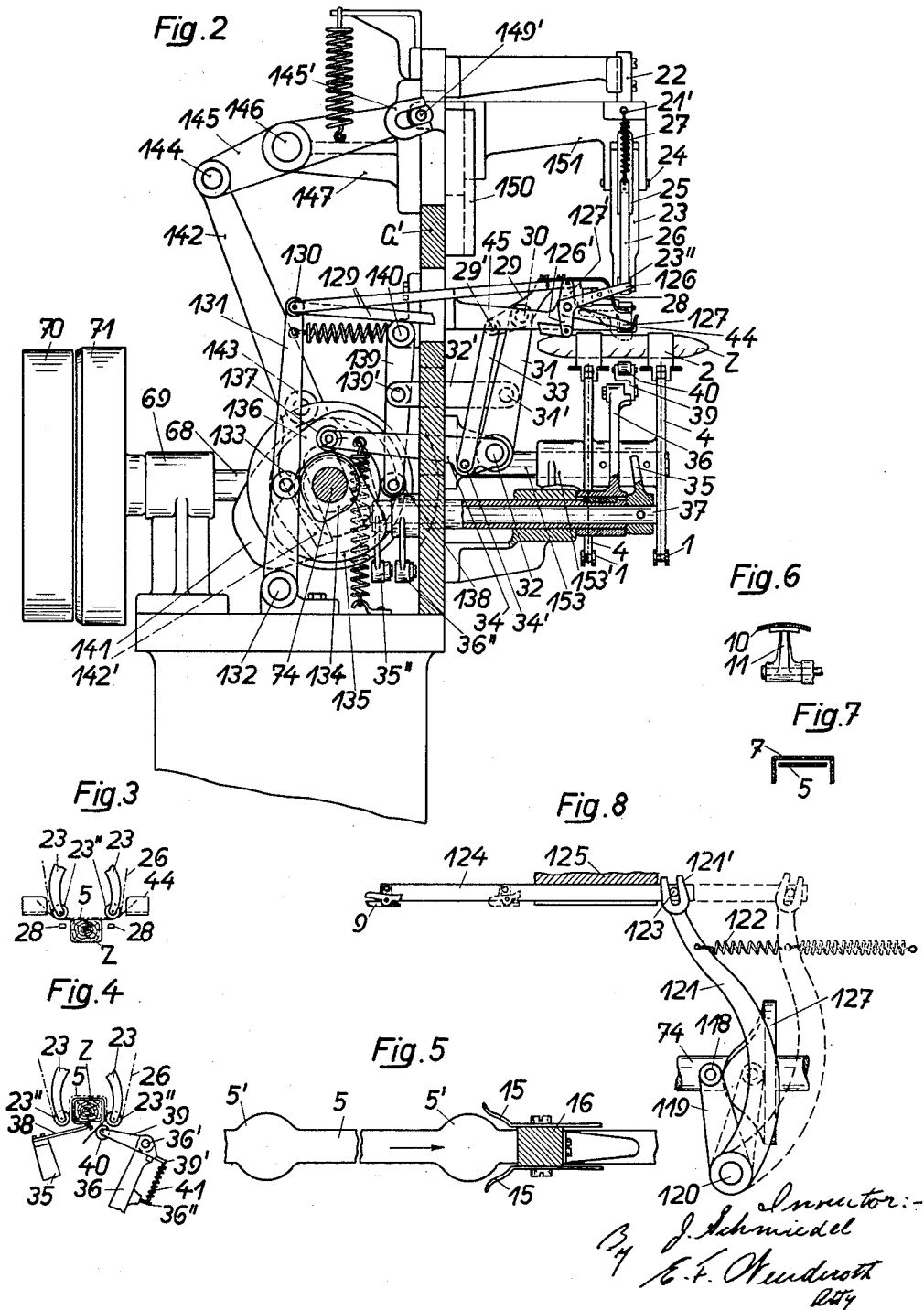
J. SCHMIEDEL

2,006,116

METHOD AND APPARATUS FOR APPLYING PAPER BANDS AND THE LIKE TO CIGARS

Filed June 1, 1934

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,006,116

METHOD AND APPARATUS FOR APPLYING
PAPER BANDS AND THE LIKE TO CIGARS

Johannes Schmiedel, Dresden, Germany, assignor
to "Universelle" Cigarettenmaschinen-Fabrik,
J. C. Müller & Co., Dresden, Germany

Application June 1, 1934, Serial No. 728,617
In Germany November 22, 1932

16 Claims. (Cl. 131—61)

This invention relates to the applying of bands of flexible material such as paper or the like to cigars, and an important feature of the invention is to apply such bands in a taut condition to the cigar which is held in readiness therefor.

An object of the invention is to provide a method and apparatus for severing band sections from a strip of material and then placing the same under tension and applying these bands to the cigars transversely of the length thereof by means of control mechanism such as fingers or grippers.

The invention resides in providing mechanism whereby the strip containing the bands may be fed from a reel and held in proper position by means of guides. The strip is engaged by a gripper grasping the ends of the strip, and mechanism is provided for drawing the gripper with the retained strip forward so that an abutment or enlarged portion usually provided upon a band may cooperate with a lug and the so yieldably controlled strip will have a tendency to move over a path somewhat greater than the length of the band or severed piece which is to be applied to the cigar.

It is an object of the invention to use a minimum amount of labor and to provide the simplest of control means so that it may be possible to work continuously from a continuous strip of material upon a reel.

It is also an object of the invention to provide mechanism which will ensure that the band or severed piece will come to rest in exactly the proper position in the vicinity of the cigar held in readiness therefor.

A further object of the invention is to provide a mechanism that will sever only the particular band which is to be applied and thereby assure the proper positioning thereof upon the cigar.

It is an object of the invention to provide means such as a suitably controlled lug or stop which is adjusted in the path of movement of the strip at the proper moment and cooperates with a depression, convexity or some configuration provided upon the strip so that when the strip end is drawn forward by a gripper mechanism, the strip will be drawn into exactly the proper position, since it is assumed that the gripper mechanism will actually draw the strip directly into contact and up to the lug or stop mentioned. The drawing of the strip exactly up to the lug or stop is actually accomplished since the gripper mechanism is so constructed as to be subject to the action of control means which are designed to advance the strip further in the feeding mechanism

even after the termination of the advance movement thereof.

It is also an object of the invention to construct the gripper mechanism yieldably or resilient so that the band will be placed under tension and held taut as it is moved to the applying position.

It is also an object of the invention to provide mechanism whereby the gripper construction can either be controlled positively so that its feeding stroke is greater than the length of the band or severed section, or the gripper mechanism may be subject to a resilient or spring traction which would have the tendency to exert further traction after the gripping mechanism has ended its movement. In the first case above the gripper mechanism may be resiliently constructed so that a certain amount of slip may occur, and in the second case the gripper jaws may be constructed rigidly so that in either case the result would be accomplished of placing the band or strip under tension.

It is a further object of the invention to provide mechanism which would prevent a strip or band from being drawn out and severed in the absence of a cigar. This is preferably accomplished by arranging a mechanism adjacent the movement of the cigars which comprises a feeler under control which will check and prevent the operation of the band applying device when a cigar is absent.

It is also an object of the present invention to provide means cooperating with the band applying device which will retain the bands in a taut or tensioned state after the band is severed and will maintain it in such state until approximately the time it is applied to the cigar.

A feature of the invention is the maintaining of the band in proper position and the delivering of the same and applying the same to a cigar immediately after the same has been severed from the strip.

With these and other objects in view which will become apparent as the description proceeds, the invention comprises the combination and arrangement of elements described below, claimed in the claims, and shown in the drawings, in which

Figure 1 is a front elevation of a preferred embodiment of the invention,

Figure 2 is a vertical cross section upon the line II—II of Figure 1,

Figure 3 is a partial view of a detail showing the manner in which the band is first applied to the cigar,

Figure 3a is a partial view of a detail illus-

trating the manner in which the band is kept under tension as it is applied to the cigar,

Figure 4 is another detail view similar to Figure 3 but with the folding of the band around the cigar partially complete,

Figure 5 is a plan view with parts in section illustrating the stop or lug cooperating with the enlarged portions or other particular configuration upon the cigar band,

Figure 6 is a sectional view illustrating the detail,

Figure 7 is a sectional view showing the relation between the strip and a guide therefor, and

Figure 8 shows a detail of the gripper actuating mechanism.

For transporting the cigars into the proper position for the application thereto of the cigar bands, there are provided the two parallel conveyor chains 1 upon which are provided the substantially U-shaped supports 2 which are disposed upon the chains 1 in such manner that the two aligned supports 2 will serve for the holding of a cigar. The upwardly extending arms 2' of the supports are preferably fitted with an elastic material 3 such as brushes, spongy rubber or the like in order to avoid any damaging of the cigars. The chains 1 are moved over the guide wheels 4 intermittently by a drive mechanism to be described hereinafter, and in such fashion that the supports 2 are thereby advanced intermittently to the position at which the cigar bands are applied.

The sections or strips of material for forming the cigar bands are cut from a strip 5 wound upon the reel 6 which is mounted upon a shaft 60 mounted in the frame wall G' which rises from the machine table.

The strip 5, as more particularly shown in Figure 5, is provided at uniform intervals with enlargements 5' upon which there is usually placed the name of the concerns manufacturing the cigars, or ornamentation of any desired type. Usually the cigar bands are placed upon the cigars so that this enlarged portion will show upon the side of the cigars.

As the strip 5 leaves the reel 6 it passes through the U-shaped guide channels 7 and 8 as more particularly shown in Figure 7, and is presented at x to a gripping mechanism or tongs 9. At this point the end of the strip is firmly held between a rigidly mounted curved plate 10 and a finger 11 pressed thereagainst by means of a weight or a spring. Located between the two U-shaped guide channels 7 and 8 is the adhesive applying device which comprises a swab 61 mounted upon a support 61' which in turn is carried by a slide 62 vertically slidable in a guide 63 attached to a wall G'. Connected to the slide 62 at the point 64 is a link member 65 which at its lower end is connected to the angle lever 66 and this angle lever 66 cooperates with a cam member described hereinafter. The swab 61 is located so as to dip into an adhesive receptacle 67 mounted upon the wall G' whenever the swab is in the dotted line position, which is the inoperative position.

Located above the adhesive applying device is the lug or stop for the enlargements 5' upon the strip which serve as abutments cooperating with the lug or stop. The lug or stop member comprises two suitably bent metal plates 15 as shown more particularly in Figure 5 which are carried by a lever 16. The latter is mounted upon a shaft 17 carried by the wall G' and is controlled by the lever 16'. Cooperating with the lug or stop 15

is a stationary plate 18 which supports the strip 5 from below.

The gripper member 9 is mounted upon a rod mechanism hereinafter described which reciprocates it between the two positions shown upon Figure 1 and marked x and y. A roller 19 is positioned adjacent the position x and is mounted upon an angle lever 20.

The roller 19 is so operated as to cause the tongs or jaws of the gripper mechanism 9 to be opened when the gripper mechanism is moved from the right to the left in order to grasp the end of the strip 5. By means of a control mechanism hereinafter described, the lever 20 is swung upwardly so that the roller will release the corresponding gripper arm or jaw in order to engage the strip end. If the gripper 9 is therefore moved to the right it will carry strip 5 along and position it in proper relation to the applying device or the banding head so that the band portion provided with the enlargement 5' is located in exactly the correct position over the cigar to which a band is to be applied.

The device for applying the band upon the cigars comprises a banding head 21 sliding upon a control tong or rod 22. Two levers 23 are pivoted at 24 upon the banding head 21. The levers 23 are urged inwardly towards each other by the two leaf springs 25. This forces the rollers 23' journaled upon the levers 23 to come into contact with the control tong 22 which has the lower end thereof curved in the form shown in Figure 1.

Mounted upon the free ends of the levers 23 are the rollers 23' over which extends a flexible band 26, the ends of which are attached to the springs 27 which in turn are connected to the banding head 21 through the medium of the pins 21'. Located adjacent the rollers 23' is the two-armed or double-pronged counter support 28 which is attached to a lever 29 rotatably journaled at 30. The pivot 30 of the lever 29 is mounted upon a link member 31 which in turn is pivotally mounted at 32 upon the frame of the machine. Pivotally connected with the link member 31 at 31' is a control or drive rod mechanism 32' which oscillates the member 31 about its pivot point 32.

A link member 33 is pivotally connected at 29' to the free end of the lever 29 and the other end of the link member 33 is pivotally connected at 34' to the lever 34 which latter is freely rotatable upon the shaft 32 and is controlled by means of a cam mechanism described hereinafter so that the front ends of the two-armed or double-pronged support 28 can describe a path as shown in dotted lines upon Figure 2.

The folding levers 35 and 36 are positioned so as to cooperate with the banding head 21. The lever 35 is fixed to the shaft 37 and the lever 36 is fixed to the hollow shaft 37'. The free end of the lever 35 carries a folding finger 38 shown particularly in Figures 1 and 4 and the free end of the lever 36 has mounted thereon a lever 39 pivoted at 36'. A roller 40 is journaled upon the lever 39. At the other end of the lever 39 there is engaged at 39' a spring 41 whose other end is attached at 36'' to the lever 36.

Located adjacent the right end position y of the gripper or tongs 9 is a control lever 42 which is mounted upon a shaft 43 which latter is designed to be actuated at suitable periods by means of a control rod mechanism hereinafter described.

Located in the vicinity of the two-armed or double-pronged counter support 28 are the two

U-shaped channels 44 which are attached to the machine frame by the arms 45.

Whenever a cigar is missing from the receptacle 2 it is necessary to prevent a feed of the strip 5 in order not to disturb the orderly operation of the apparatus, and this mechanism will now be described. A feeler member 46 is mounted adjacent the chains 1 and is pivotally carried by a lever 47, the lever 47 being mounted upon an axis 48 which in turn is journaled in the machine frame and so controlled and actuated after each forward movement of the chains that the feeler 46 and the rod mechanism is carried into the operative position through its own weight. The free end 47' of the lever 47 is hook-shaped and when the feeler 46 does not find a cigar in the receptacle 2 then the hook end 47' will engage behind the angular projection 20' of the lever 20 and check the latter when it is swung out in order to release the arms or jaws of the gripper mechanism 9. Therefore, if no cigar is present the corresponding arm of the gripper is not released by the lever 20 and therefore the gripper does not engage the end of the strip 5. When the hook end 47' has engaged the projection 20' the movement of the gripper mechanism to the right will take place without withdrawing the strip. Also located adjacent the position γ are the two pressure members 49 which are covered with a resilient or elastic material 49' and the pressure members are mounted upon levers 50 and 54 positioned adjacent the chains 1.

These oscillating levers are mounted upon the shafts 52 and 53 and the arm 51' of the lever 51 is engaged by the lever 54 so that both pressure members 49 may be moved together simultaneously due to the connection of the lever 51 with the lever 50. The mechanism for driving the machine and the various cam mechanisms for operating the various instrumentalities set forth above will now be described.

The machine is driven by the shaft 68 which is journaled in the supporting block 69 mounted upon the machine table G and the shaft 68 has mounted thereon an idle belt pulley 70 and a fixed belt pulley 71. A cam shaft 74 which is journaled in the blocks 75 and 76 mounted upon the table G is driven by means of the bevel gears 72 and 73. At the extreme left end of the shaft 74 is the cam disk 77 with which a roller 78 cooperates. The roller 78 is mounted upon the angle lever 79 and the latter is pivotally mounted upon the shaft 80 fixed to the wall G'. Connected with the free end of the angle lever 79 is a link member 81 whose other end is connected with the free end of the lever 16'.

Also mounted upon the shaft 74 is the cam disk 82 having the curved cam path 83 with which the roller 84 provided upon the angle lever 86 cooperates. The angle lever 86 is pivotally mounted upon the shaft 86' fixed to the wall G'.

A roller 86 is provided upon the angle lever 87 and this roller cooperates with the cam track 85. The angle lever 87 is pivotally mounted at 88 upon the wall G' and is connected by the link 89 with the lever arm 90 fixed to the shaft 88.

The angle lever 93 has a roller 92 mounted thereon travelling the cam disk 91. Connected to the free arm of the angle lever 93 is a link 94 whose other end is connected to the lever arm 95 and the latter is journaled upon the pivot axis 96 mounted in the wall G' and connected with the lever 20.

There is also provided upon the shaft 74 the cam drums 97 and 98 having cam grooves in

which the rollers 101 and 102 of the levers 99 and 100 engage. The levers 99 and 100 are pivotally mounted at 103 and 104 in the wall G'. The free end of the lever 99 is connected by a link member 105 with the arm 35'' of the lever 35 and the free end of the lever 100 is connected by a link 106 with the arm 36'' of the lever 36.

There is also provided upon the shaft 74 a cam member 107 having a cam path 108 and a cam path 109. The roller 111 upon the angle lever 110 travels the cam path 108. The lever 110 is pivotally mounted at 112 upon the machine frame and is connected by a link 113 with a lever 114 which lever is fixed to a shaft journaled in the frame wall and in a journal upon the slide guide 125. The shaft of the lever 114 has fixed thereto the control lever 43.

Cooperating with the cam path 109 is a roller 115 mounted upon the lever 116 and the lever 116 is fixed to a shaft 53 which also has fixed thereto the lower pressure lever 54 and the shaft 53 is journaled in the wall G' and also in an arm of the slide guide 125.

The gripper mechanism or tongs 9 are controlled by the cam 117 upon the shaft 74. A roller 118 mounted upon the lever 119 cooperates with the cam 117. The lever 119 is fixed to the shaft 120 journaled in the wall G' and also fixed to the shaft 120 is the lever 121. A spring 122 urges the lever 121 in a clockwise direction and thereby maintains contact of the roller 118 against the cam 117. The lever 121 has a forked end 121' which engages with a pin 123 provided upon the rod or slide 124 carrying the grippers 9. The slide 124 is slidably mounted in the slide guide 125 mounted upon the wall G'.

The cutting mechanism for the strip comprises the two cutting blades 126 and 127 which are pivotally mounted upon a common shaft provided upon the frame arm 45. The shears 126 and 127 are provided with the rectangular projections 126' and 127' which are connected to the link members 129 which in turn are pivotally connected to the common pivot pin 130 upon the control lever 131. The control lever 131 is pivotally mounted at 132 and is also provided with a roller 133 which cooperates with a cam member 134 mounted upon the shaft 74.

The counter support 28 is controlled by a cam 135 and a cam 136. A roller 137 provided upon the lever 34 cooperates with the cam 135 and a roller 138 cooperates with the cam 136. The roller 138 is journaled upon the lever 139. The latter lever, with which the link 32' is connected, at 139', is journaled at 140 in the wall G'. The cam 135 controls the lifting movements of the counter support 28 while the cam 136 controls the movements of the counter support 27 to and from the applying head for the bands.

The banding head 21 is operated by the cam 141 also mounted upon the shaft 74 by means of a roller 143 journaled on the rod 142 cooperating with said cam 141. The rod 142 has a forked end 142' encircling the shaft 74 and the rod 142 is connected by means of a pivot pin 144 with the double-armed lever 145 pivotally mounted upon the arm 147 at 146. The arm 147 is mounted upon the frame G' and the lever 145 has a forked end 145' which engages the pin 149' provided upon the slide 149. The slide 149 is vertically slidable in a guide 150 attached to the wall G' and the banding head 21 is mounted upon the slide 149 by means of the arm 151.

The guide wheels 4 for the chains 1 shown at the left in Figure 1 are freely rotatable on the

shaft 152 which is mounted upon the wall G' while the guide wheels 4 occurring at the right of Figure 1 are fixedly mounted upon the shaft 153 which is journaled in the wall G' and the journal 153'. The shaft 153 also has attached thereto a ratchet wheel 154 which is actuated by a pawl 155 pivotally mounted at 156 upon the lever 157 which in turn is pivotally mounted upon the shaft 153. Cooperating or thrust rod 158 is connected to the free end of the lever 157 at 157' and the other end of the rod 158 is pivotally connected to the crank pin 159 fixed upon the back of the bevel gear 12. The operation of the apparatus set forth above is as follows.

When the grippers 9 have moved into the position x the lever 20 is swung upwardly so that the gripper jaws are closed by the upper spring actuated gripper jaw. Such swinging movement of the lever 20 can only be made when a cigar is present in the supports 2 controlled by the feeler 46. After the lug or shoulder 16 has been raised into the dotted position shown in Figure 1, the grippers 9 are then moved to the right in Figure 1 and the strip is carried along by the grippers and placed over the counter support 28. Prior to the time that the grippers 9 reach the right end position shown by y, the lug 16 is lowered so that the plates 15 mounted thereon will come into position so as to contact the enlargements 5' provided upon the strip 5. The movement of the grippers is somewhat greater than the length of a band. Also because the jaws of the grippers are closed by springs, there is permitted the possibility of a slip between the end of the strip and the gripper jaws. When the enlarged portions 5' of the strip 5 meets the plates 15, the strip will be held while the first part of the strip lying in the vicinity of the counter support 28 is rendered taut and the tongs 9 pass to their end position which is permitted due to the slight slip of the engaged strip end in the gripper jaws.

The banding head 21 then descends to such an extent that the rollers 23'' with the band 25 thereabout will come into position upon the two-pronged counter support 28, while grasping the corresponding band or strip section. The lever 42 will now open the grippers 9 and simultaneously the shears 126 and 127 are operated for cutting the band from the strip. Also, by means of a weight or spring the finger 11 is pressed upwardly so that the new strip end is held in curved position against the plate 10. The result of such action is that the strip end after being cut by the shears 126 and 127, will not be displaced or get out of order. At the same time however, the curving of the new strip end will impart thereto a certain degree of rigidity so that the grippers may engage the same more securely.

The band or strip section which has been cut and is lying between the supports 28 and the band 26 encircling the rollers 23'', is then, while the banding head 21 and the supports 28 are carried downwardly, brought first into the vicinity of the U-shaped channels 44 wherein the ends of the cigar band or strip section are straightened. Upon further descent of the central part of the band having the enlargement 5' thereon, the band will come into the position shown in Figure 3. In this manner the central or enlarged portion is first placed upon the cigar Z.

Thereafter the two-pronged support 28 is first lowered somewhat and then finally moved off from below. The movement thereof is shown in dotted lines upon Figure 2. Then the banding

head 21 descends further and the rollers 23'' will roll along the sides of the cigar. The function of the band 26 is to apply the band or strip section perfectly about the cigar. When the rollers 23'' have moved into the position shown in Figure 4, then the lever 35 is swung to the right and a band end is fastened down by the folding finger 38 carried by the lever 35. As the lever 35 is moved to the left simultaneously therewith, the lever 36 is moved to the left and the second end which is the end provided with the adhesive, is pressed down upon the end of the band previously folded by the finger 38. Thereafter the lever 36 with the roller 40 is swung back to the right to its initial position and the banding head 21 is carried upwardly so that the cigar which has just been banded is released by the folding or band applying means.

A free path is thus provided for the grippers 9 which can then move to the left as shown in Figure 1 for a new band section. In accordance with the control of the feeler 46, the lever 20 is actuated so as to close the tong or gripper jaws for engaging the new strip end. When the grippers are again moved to the right the chains 1 will advance an operative step so that the cigar which has just been banded will come within the range of the two pressure jaws 49. As soon the chains 1 become stationary the two pressure members provided with the elastic pressure parts are moved towards each other and the band is lightly pressed together particularly at the point where it has been provided with adhesive and at approximately the same time a new band is applied upon the cigar presented in the adjacent support.

In the construction above described it is assumed that the gripper jaws are pressed together so weakly that the difference between the movement of the tongs or grippers and the length of the strip is compensated by a slippage between the strip end and the jaws of the grippers 9. The jaws of the grippers can however, be so designed as to act firmly against each other so that no slippage is possible when the grippers have been closed. In such case the spring 122 must be so adjusted or constructed that the strip may not become torn or damaged when the strip is retained on one hand by the plates 15 and the roller 118 cannot move into contact with the cam 117. Therefore in this latter case the spring 122 must be only strong enough to act merely to bring the roller 118 into contact with the cam 117, but when the strip is held by the grippers the spring 122 should act only to retain the band or strip section in taut or tensioned condition.

A counter plate 160 is also provided which is arranged relatively to the adhesive swab 61 and which while the strip 5 is stationary is moved from above by the cam 83 to the strip 5.

The above described arrangement constitutes a preferred form of the invention, but it is understood that all modifications thereof as will come within the spirit of the following claims also constitutes a part of the invention.

I claim:—

1. The method of applying bands to cigars and the like comprising severing a band from a strip of flexible material and then applying the same to a cigar while said band is maintained in a tensioned condition.

2. The method of applying bands of paper to cigars or the like comprising cutting a section from a strip of band material, placing said section under tension, then folding the same while in said tensioned condition about a cigar and then pressing said band against said cigar.

3. The method of applying bands to cigars and the like comprising severing a band section from a strip of material, placing said severed section under tension, applying adhesive to said severed section, folding said band about said cigar and then pressing said band against said cigar after the same has been folded thereabout in order to secure a setting of said adhesive.

4. An apparatus for applying bands to cigars and the like comprising means for feeding a strip of material having enlargements thereon, means cooperating with said enlargements for preventing the feed of said strip except at predetermined intervals, means for feeding said strip to a position adjacent a cigar to be banded, means for placing said strip under tension, means for severing a band from said strip, means for maintaining said band under tension and means for applying said band to a cigar.

5. An apparatus for applying bands to cigars and the like comprising means for placing a band under tension and means for applying said band while under tension to a cigar.

6. An apparatus for applying bands to cigars and the like comprising means for feeding a web of material, means for cutting bands from said web, means for placing said bands in a taut condition and means for applying said bands to a cigar.

7. An apparatus for applying bands to cigars and the like comprising means for feeding a web of material, means for applying adhesive to said web of material at spaced points, means for placing said web of material under tension, means for cutting said web into band sections while maintaining said cut band under tension and means for applying said band about a cigar.

8. An apparatus for applying bands to cigars and the like comprising means for placing a band in a taut condition, means for applying said band while in said taut condition to a cigar and means for thereafter pressing said band against the sides of said cigar.

9. An apparatus for applying bands to cigars and the like comprising means for feeding individual cigars to a band applying position, means for holding a band in taut condition above said band applying position and means for applying said band while in said taut condition to said cigar in said band applying position.

10. An apparatus for applying bands to cigars and the like comprising means for feeding individual cigars to a band applying position, means for applying a band while under tension to a cigar while in said band applying position and means for preventing said last-named means from operating if no cigar is present in said band applying position.

11. An apparatus for applying bands to cigars and the like comprising means for feeding a strip or web of material to a band applying position, means cooperating with said strip for pre-

venting the advance thereof to said band applying position and means cooperating with said last-named means for placing said web of material under tension.

12. An apparatus for applying bands to cigars and the like comprising means for feeding a web of material to a band applying position, means cooperating with said strip for preventing the advance of said strip to said band applying position, means cooperating with said last-named means for placing said strip of material under tension, means for severing said strip into bands and means for applying said bands in taut condition to a cigar.

13. An apparatus for applying bands to cigars and the like comprising band applying means, a reciprocating gripper mechanism for feeding a strip of material to said band applying mechanism, means cooperating with said gripper mechanism for placing said strip of material under tension, means associated with said band applying mechanism for maintaining a section of said strip under tension and means for severing a section from said strip of material.

14. An apparatus for applying bands to cigars and the like comprising means for intermittently feeding individual cigars to a band applying position, a band applying mechanism for applying bands under tension, means for preventing the operation of said band applying mechanism in the absence of a cigar at said band applying position and a gripper mechanism for bringing a strip of material to said band applying position.

15. An apparatus for applying bands to cigars and the like comprising a band applying mechanism, means for bringing individual cigars into position so as to be operated upon by said band applying mechanism, means for feeding a strip of material to a position adjacent said band applying mechanism, means for placing said strip of material under tension, means for severing said strip of material into a band section while maintaining said band section under tension and means for pressing said band section about a cigar after the same has been applied.

16. An apparatus for applying bands to cigars and the like comprising an endless carrier for feeding individual cigars to a band applying position, means for intermittently operating said endless carrier, means for feeding a strip of band material to said band applying position, means acting against the advance of said strip of material at predetermined intervals, a gripper mechanism cooperating with said last-named means to place said strip under tension, a band applying mechanism and a counter support cooperating with said band applying mechanism for maintaining a section of said strip of material under tension so that a band of material may be applied under tension to a cigar.

JOHANNES SCHMIEDEL.