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METHOD OF AND APPARATUS FOR MANUFACTURING CONFECTION PRODUCTS

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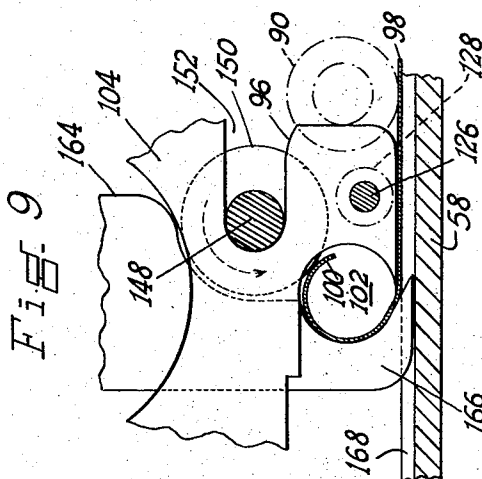
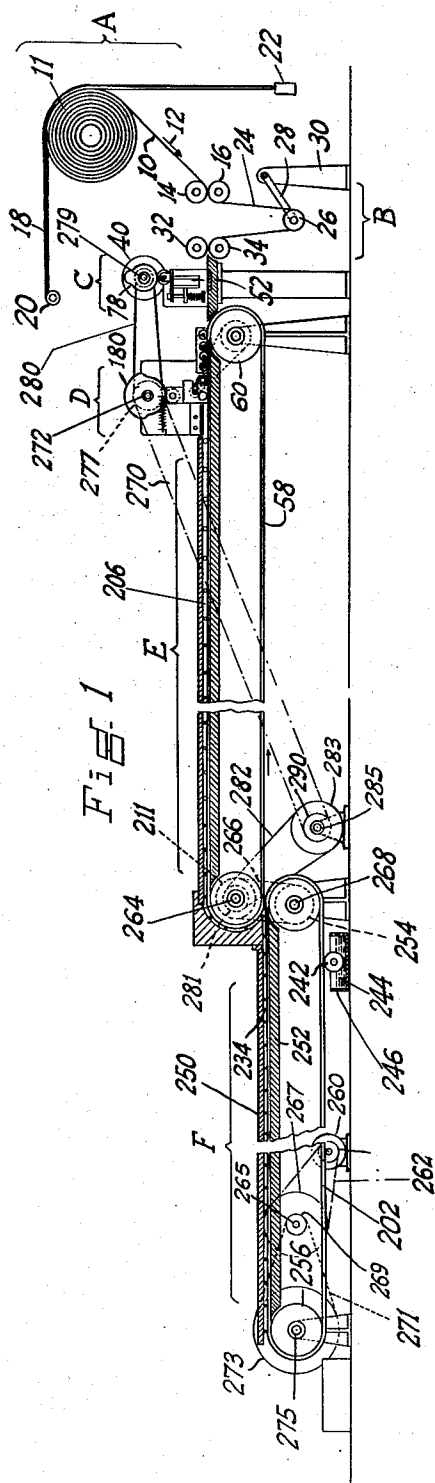
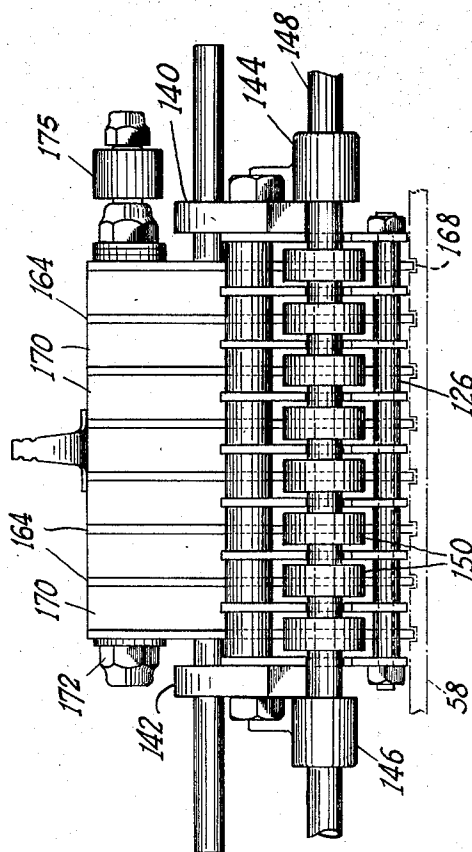


Fig. 8



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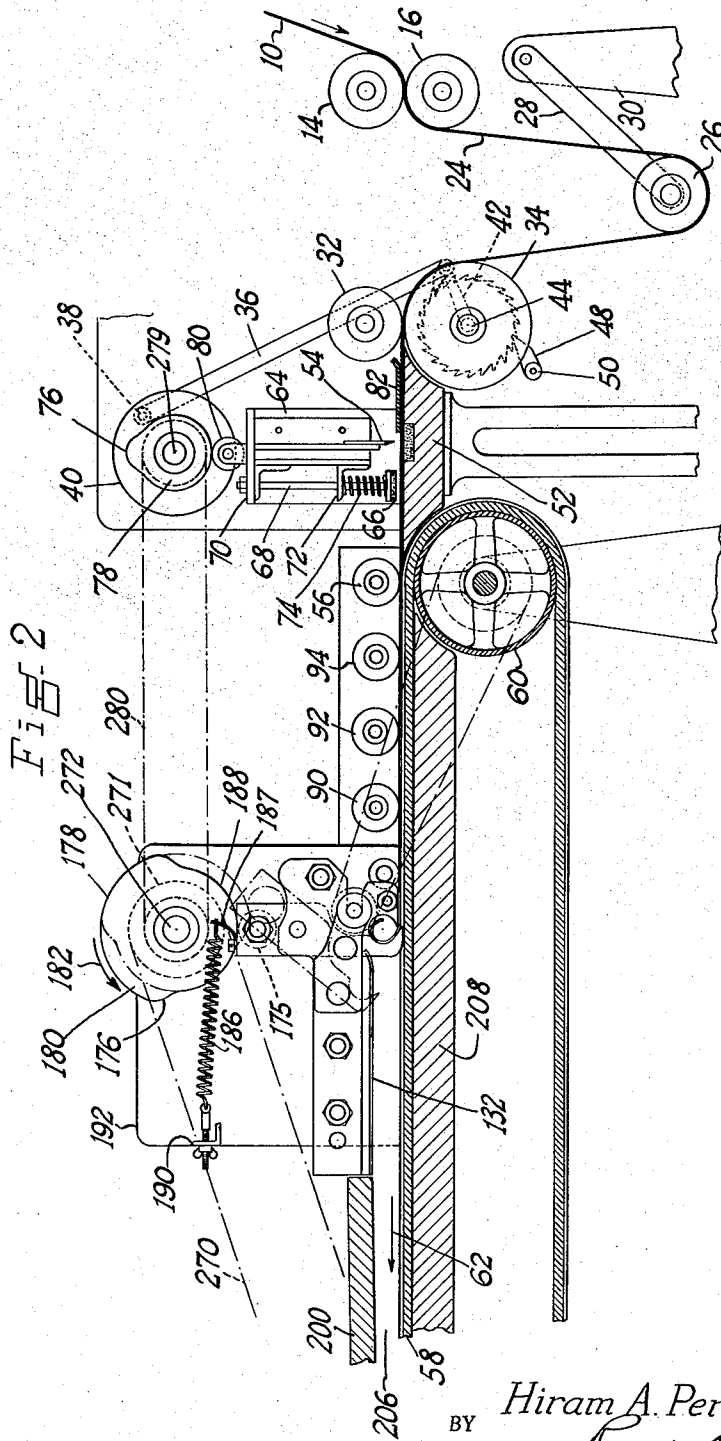


Fig. 2

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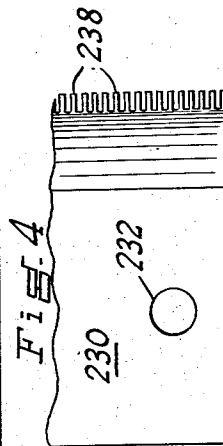
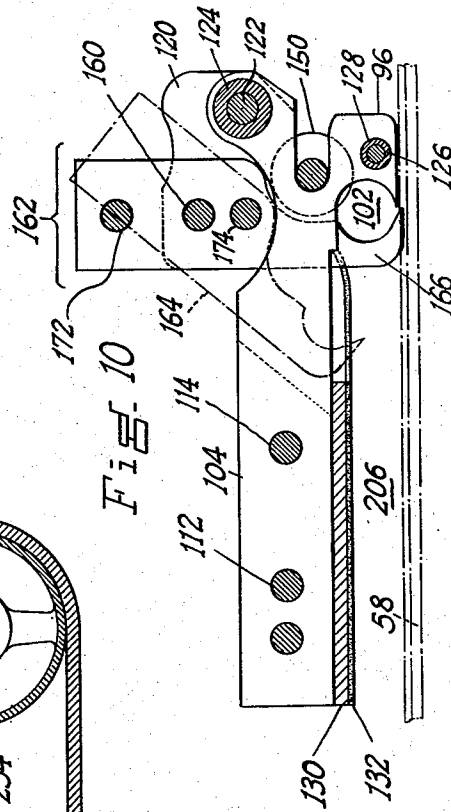
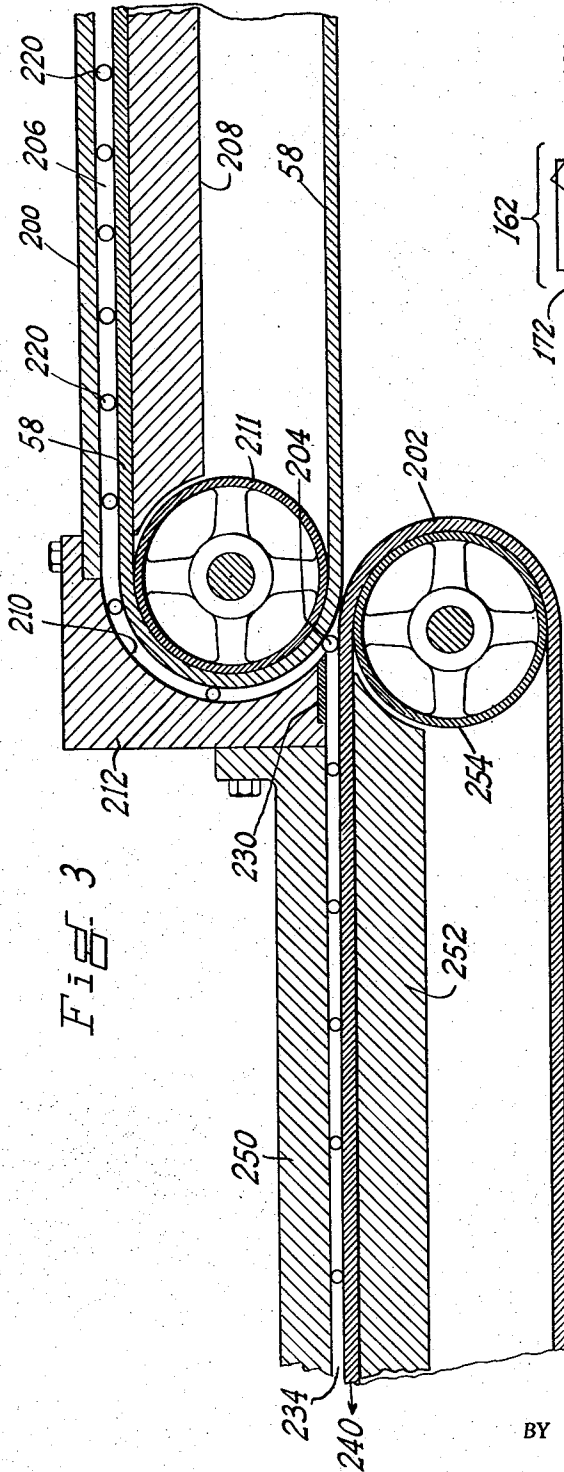
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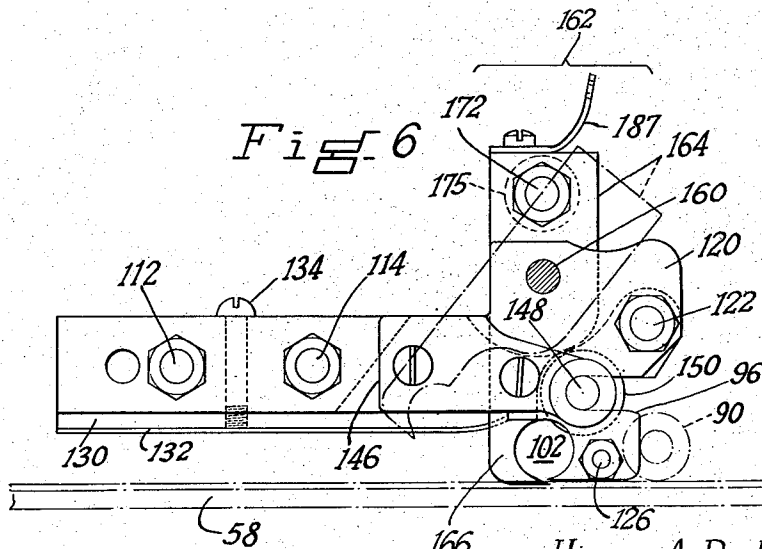
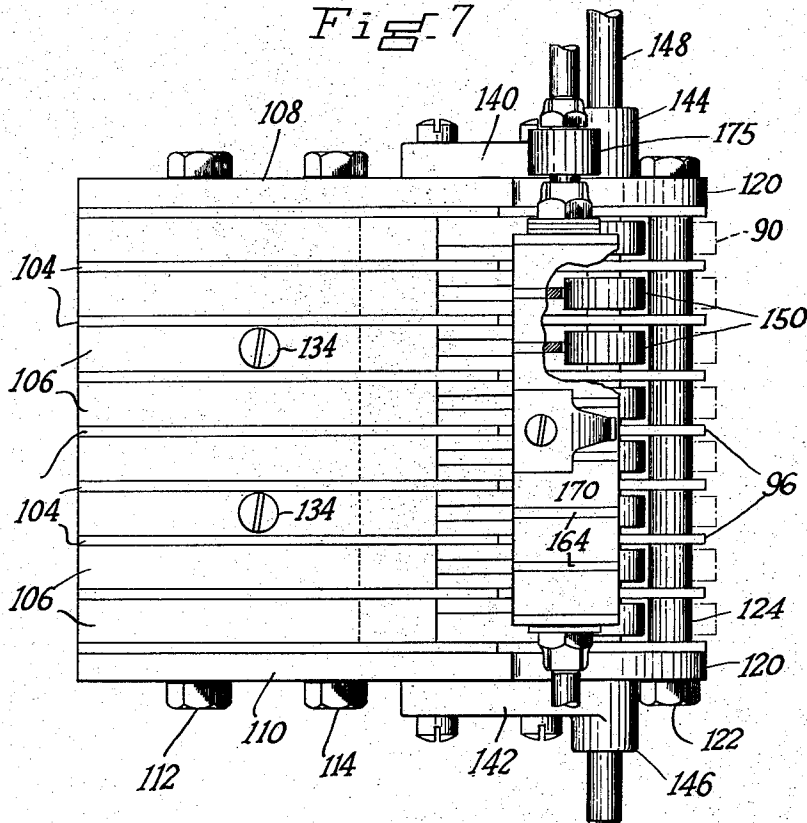
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METHOD OF AND APPARATUS FOR MANUFACTURING CONFECTION PRODUCTS

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13 Claims. (Cl. 93—1)

This invention relates to the manufacture of confection sticks of tightly rolled up paper convolutions permanently adhering so as to constitute a non-splinterable support having an effective degree of rigidity.

The invention will be readily understood from the following description when considered in connection with the accompanying drawings which disclose a preferred embodiment of the apparatus for effecting the manufacture of confection sticks.

In the drawings:

Fig. 1 is a comprehensive view in the nature of a vertical section through apparatus for the manufacture of the illustrative confection sticks.

Fig. 2 is a vertical section showing a part of the illustrative apparatus on an enlarged scale.

Fig. 3 is a vertical section through another part of the illustrative apparatus in which the compacted stick rolls are transferred from the dry compacter to the second compacter which bonds the outside paper convolutions of the rolls and completes the compacting of the rolls until their constituent convolutions take on a permanent set.

Fig. 4 is a detail view showing a part of the knife edge roll holder at the point of transfer of the rolls from the dry compacter to the bonding compacter.

Fig. 5 is an end elevation of the holder shown in Fig. 4.

Fig. 6 is a side elevation of the convoluter which causes the paper sections to be rolled up into loose rolls and thereafter released to the compacting mechanism.

Fig. 7 is a plan of the convoluter shown in Fig. 6.

Fig. 8 is a front elevation of the convoluter.

Fig. 9 is a detail view showing parts of the convoluter and indicating its action in the forming of the loosely wound rolls.

Fig. 10 is a vertical section through the convoluter, indicating the manner in which the loosely wound stick rolls are released to the compacting mechanism.

In Fig. 1 of the drawings the main feeding mechanism for delivering the paper from a roll to an apparatus may be considered as indicated generally at A. This feeding mechanism delivers the paper strip to a festooning mechanism located at B, and from this mechanism the paper is intermittently fed to a cutting mechanism C which severs the paper to uniform sections each of which is subsequently formed into a loosely wound roll by the convoluting mechanism at D.

From the convoluting mechanism the loosely wound roll is passed through the dry compacter

E which delivers the rolls to the bonding or wet roll compacter F. The paper strip 10 is caused to be unwound in the direction of the arrow 12 from the supply roll 11 by the rolls 14 and 16 of the main feeding mechanism. At least one of these rolls is continuously driven at constant speed and the rolls are pressed together so as to exert a sufficient grip upon the paper.

In order that the paper unwinding from the supply roll 11 may be maintained slightly taut between the supply roll and the feeding rolls 14 and 16, a friction brake is applied. This may consist of a flexible strip 18 fixed at 20 and extending over the roll 11, with a weight 22 hung on the strip as indicated in order to maintain its braking effect.

Beyond the main feeding rolls 14 and 16 the paper is maintained in the festoon 24 by the floating roller 26 rotatably mounted on an arm 28 freely pivoted to a support 30 as shown in the drawings.

From the festoon roller 26 the paper passes through auxiliary feeding mechanism consisting of the rollers 32 and 34. These rollers are sufficiently pressed together to cause the paper to be gripped between them and intermittently advanced to the cutting mechanism C. The auxiliary feeding mechanism may be intermittently operated by a ratchet and pawl mechanism including the connecting rod 36 pivoted at 38 to the constantly rotating element 40 of the cutting mechanism. The connecting rod is pivotally connected at its other end to an arm 42 freely rotatable about the shaft 44 upon which the roll 34 is mounted. A driving pawl may be associated with the end of the arm 42 near the pivoted connection of the latter with the rod 36 and a spring pressed pawl 48 mounted upon a fixed pivot at 50 may prevent retrograde movement of the roller 34.

The auxiliary feeding rolls have a peripheral speed which is approximately twice the peripheral speed of the driving rollers 14 and 16 of the main feeding mechanism, and therefore while the rollers of the auxiliary feeding mechanism are operative, the festoon about the roller 26 is decreased in length and that roller is elevated. This may also be referred to as taking up the slack in the paper between the constantly rotating main feeding mechanism and the intermittently operating auxiliary feeding mechanism.

After the auxiliary feeding mechanism including the driven roll 34 advances the paper along the bedplate or cutting platform 52 a distance equal to the predetermined dimension of the pa-

per section, the driving pawl carried by the arm 42 begins its retrograde movement and the auxiliary feed is therefore inoperative until the connecting rod 36 has completed its movement in that direction. During this time the main feeding mechanism including rollers 14 and 16 is constantly advancing the paper so that the festoon is increased in length by the weight of the freely rotatable roller 26.

During the paper advancing movement of the auxiliary feed roller 34 the paper is advanced beyond the knife 54 to a position beyond the point at which the first floating roller 56 tends to engage the upper run of an endless belt 58 which drives the roller 60. This belt is so driven that its upper run moves in the direction of the arrow 62.

The distance of advance of the paper beyond the knife 54 is equal to the predetermined dimension of the section to be severed. When this advance has been completed the forward movement of the paper stops and the cutting mechanism is brought into operation. This cutting mechanism includes a cross-head 64 appropriately and accurately confined between parallel vertical guides so that the knife maintains a constant position with reference to the advance of the paper. The knife is fixed to the cross-head and the latter also carries a presser foot 66 fixed upon the lower end of a stem 68 which is freely slidable in aligned openings in the upper and lower supports 70 and 72 rigid with the cross-head. Between the lower support 72 and the rubber faced presser foot 66, there is a coil spring 74 for keeping the presser foot continuously urged downwardly from the cross-head. Thus, when the raised portion 76 of the constantly rotating cam 78 strikes the cam roller 80 the entire cross-head is moved downwardly. The presser foot, due to its location at a level below the lower edge of the knife 54 first engages the paper section which is stationary upon the cutting bed 52, and holds the paper flat against the upper surface of the bed in order that it may be cleanly and accurately cut by the descending knife 54. As soon as the paper strip is severed and the raised circular portion 76 of the cam has passed out of contact with the roller A the cross-head with its knife and presser foot may be immediately retracted from contact with the paper section by a suitable spring which constantly tends to hold the roller A against the surface of the cam 78 and elevate the cross-head.

While a paper section is being severed by the knife 54 that part of the paper in front of the knife 54 is held approximately against the surface of the bed plate 52 by a guide 82.

It will be appreciated that while a paper section is being severed by the knife 54 that the leading edge of that section is pressed lightly against the upper run of the endless belt 58 so that the latter is constantly tending to advance the section in the direction of the arrow 62. Although this force is not sufficient to tear the paper or injure it in any way it is sufficient to immediately cause the severed section to be advanced when that section is released by the upward movement of the presser foot 66. Thereupon the severed section advances along the upper surface or upper run 58 of the endless belt toward the convoluting mechanism D and it is held flat against the belt 58 during this advance by the floating rollers 90, 92 and 94. There are enough of these rollers to maintain the paper

section flat against the top surface of the belt 58 until the leading edge of the section passes under the fixed guides 96 of the convoluter D. The association of the roller 90 with the guides 96 is clearly indicated in Fig. 9 of the drawings, the paper section 98 being shown with its leading edge 100 within the convoluting chamber 102 of the convoluter.

The fixed guides 96 of the convoluter are shown in plan in Fig. 7 of the drawings and in side elevation in Figs. 6 and 10. These guides 96 are in the form of bars, and, in one embodiment, they are made of brass of $\frac{3}{8}$ " in thickness. They have rearward extensions 104 and they are held rigidly in spaced relationship by interposed steel bars 106 which may be of $\frac{1}{8}$ " in thickness. The entire body of the guides 96 and the bars 106 are maintained as a rigid frame between side frame members 108 and 110 by bolts 112 and 114 which pass through all these members as indicated in Figs. 6, 7 and 10 of the drawings. This frame is rigidified and strengthened at its forward portion by the provision of the forward extensions 120 (see Fig. 10) which have aligned openings to receive a rod or bolt 122. This bolt extends through all of the forward parts of the guides 96 and is encircled between the extensions 120 by collars 124 which are of the same width as the steel bars 106. Thus the entire front end of the convoluter frame is strengthened when the bolt 122 holds all of the collars 124 tightly between the extensions 120.

The lower and forward portions of the guides 96 are similarly strengthened by a bolt 126 which passes through these guides and has spacing collars 128 tightly gripped between the successive guides.

The entire frame of the convoluter including the parts 104 and 106 as well as the side frame members 108 and 110 is rigidly secured to suitable main side frame members in order that the lower surfaces of the guides 96 may be maintained in their relationship to the endless belt 58 indicated in Fig. 9 of the drawings and the lower surface of the convoluter frame maintained in fixed relation to the upper surface of the belt 58 rearwardly of the convoluting zone 102. For a purpose which will later appear the lower surface of the convoluting frame rearwardly of the convoluter zone 102 is covered by a plate 130 having a non-metallic facing 132 bonded thereto. This plate is fixed to the convoluter frame by stud bolts 134 as indicated in Fig. 6 of the drawings.

Laterally of the side frame members 108 and 110 of the convoluter frame there are bearing members 140 and 142 having aligned journal bearings 144 and 146 integral therewith. The members 140 and 142 are rigidly secured to the convoluting frame as indicated in Fig. 7 and the journal bearings 144 and 146 receive the shaft 148 for convoluting rollers 150. These rollers may consist of rubber rollers forced onto the shaft 148 so as to be non-rotatably connected thereto.

The shaft 148 is arranged so as to be received within the notches or slots 152 between the upper and lower forward extensions 120 and 96 of the fixed guides of the convoluter. This permits the entire convoluter roller assembly with the bars 140 and 142 to be readily detached for repair or replacement.

The convoluting rollers 150 are arranged between the fixed guides 96 and the shaft 148 is so

rotated that the rollers have a peripheral speed which is slightly more than that of the peripheral speed of the conveyor 58. Thus when the peripheries of the rollers 150 extend slightly within the confines of the convoluting chamber 102 the leading edge of a paper section will not only be acted upon as indicated in Fig. 9 of the drawings to reduce the frictional resistance to the advance of the section but the rapid convolution of the section will be also promoted by the continuous action of the rollers 150 upon the outer convolution of the paper section during its entire exposure to the action within the convoluting zone.

Appropriate side frame members are secured to the fixed frame of the convoluter so as to rotatably support a rod 160 which forms a pivot for a movable section of the convoluter indicated generally at 162 in Figs. 6 and 10 of the drawings. This movable section has roll releasing guide members 164 the lower ends 166 of which are movable from the full line positions indicated in Figs. 6 and 10 of the drawings to the dotted line positions. These lower ends have the forward surfaces shaped to define parts of the convoluting chamber 102, and their extreme tips extend into grooves 168 in the top surface of the endless belt 58 as indicated in Figs. 8, 9 and 10 of the drawings. Their forward edges provide sloping surfaces upwardly and rearwardly inclined so as to initiate the curling movement of the strip 98 within the convoluting chamber 102 when the parts are in the relationship indicated in Fig. 9 of the drawings. The movable convoluter section also includes the aluminum spacers 170 as indicated in Figs. 7 and 8 and the entire assembly of the releasable guides 164 and the spacers 170 are secured together so as to form a rigid unit. For this purpose bolts 172 and 174 extend through all of these members, and one end of the bolt 172 beyond the assembly of the members 164 and 170 affords a mounting for a rotatable cam engaging roller 175.

The cam roller 175 is periodically engaged by the raised surface 178 of the constantly rotating cam 180 to move the entire section 162 from its full line, or operative position, to its dotted line or roll releasing position as clearly indicated in drawings. The cam 180 rotates in the direction of the arrow 182 and the raised concentric surface 178 of the cam is of such extent that the entire movable section 162 will be held in its roll releasing position long enough to permit the loosely wound paper roll to be influenced by the action of the endless belt 58 so that it is moved out of the range of movement of the lower end 166. Immediately upon the movement of the loosely wound roll beyond this range the spring 186 acts to move the entire section 162 to its operative position wherein it cooperates with the fixed guides 96 and defines the convoluting chamber 102. The period of time during which the movable section is held in this operative position is determined by the circumferential extent of the inner concentric surface 188 of the cam 180.

The spring 186 has one end secured to a clip 187 fast to the movable section 162 and its other end adjustably fixed to a bracket 190 which is mounted upon a fixed portion 192 of the supports for the apparatus.

It will be understood that as soon as the movement of the assembly 162 from its full line position to its dotted line position has released a convoluted paper roll from the convoluting chamber 102 that a succeeding paper section is approach-

ing the convoluting chamber and is about to enter it. At the same time the released paper roll is moved forwardly by the belt 58 into a contracting or tapered passage 206 above the upper run of the belt. This passage is formed by the facing 132 and by a fixed plate 200 and the upper surface of the belt. The continuity of its taper is such that this passage decreases in depth to a position at the junction of the bonding belt 202 and the endless belt 58. This position is indicated at 204 in Fig. 3 of the drawings.

The lower surface of the passage 206 is closely and accurately determined by the upper surface of the bedplate 208 along which the upper run of the belt 58 moves. This bedplate extends to close proximity to a pulley or roller 211 around which the belt 58 is trained and the surfaces of the passage 206 beyond the rearward end of the plate 202 are determined by the surface of the belt and the inner curved surface 210 of a metallic block 212 secured in fixed relation to the described parts.

As the loosely wound rolls 220 proceed along the contracting passageway 206 the number of convolutions in each roll is increased and pressure is maintained on the rolls. This action results from the relation of the depth of the passageway 206 to the diameter of the rolls as they pass from the convoluter and from the rolling up action resulting from the forward movement of the belt 58 while the opposite sides of the rolls are pressed against the stationary plate 200 and the inner and curved surfaces of the block 212.

As each paper roll emerges from the passageway 206 it expands to a limited degree in the space between the belts 58 and 202 and forwardly of the toothed edge of the transfer plate 230. This plate is fixed to the lower surface of the block 212 as clearly indicated in Fig. 3 of the drawings. It is secured thereto by fastening devices which pass through the openings 232.

The proper transfer of each paper roll from contact with belt 58 to the bonding and sealing passageway 234 above the upper run of the belt 202 is promoted by the teeth 238 formed in the knife edge of the member 230. These teeth prevent excessive unwinding or expanding of the roll as it emerges from the passageway 206 and they cause the roll to be so gripped that the action of the belt 202 moving in the direction of the arrow 240 will initiate the movement of the roll into the passageway 234.

The lower run of the belt 202 is indicated in Fig. 1 of the drawings as in contact with a roller 242 for the purpose of supplying moisture or an adhesive to the surface of the belt. This roller is mounted in fixed bearings so that it continuously passes through a body of fluid 244 within the receptacle 246. In this way a small amount of adhesive or other fluid is applied to the outer surface of the belt 202 at a position near the point of transfer of the paper rolls from the passageway 206 to the passageway 234. Consequently the fluid is applied to each roll immediately after it emerges from the passageway 206, and while it is in contact with the teeth 238 of the member 230. This application of fluid takes place immediately after the expanding of the roll so that the fluid can be applied to surfaces of the roll which will be within the roll after it is subjected to the action of the belt 202 in the passageway 234. The latter is formed between the upper surface of the belt 202 and an upper plate 250 which may be adjustable so as to control the taper of the passageway. The upper surface of

the upper run of the belt 202 is held accurately in its desired relation to the lower surface of the plate 250 by the bedplate 252 which extends from the forward pulley or roller 254 to the rotating element 256 about which the belt 202 is trained at the discharge end of the apparatus.

The action within the passageway 234 is similar to that which takes place within the passageway 206, but the rolls may be compacted to a greater degree and thus rolled to the desired diameter of the ultimate product above the belt 202. The action of this belt also results in a bonding of the exterior convolutions of the rolls and when adhesive has been applied by the roller 242 the rolls are adequately sealed against unwinding when they emerge from the bonding passageway 234.

In Fig. 1 of the drawings the belts or conveyors 58 and 202 are indicated as driven by a motor 260. The belt 262 connects the motor with a counter-shaft 265 upon which the driving elements 267 and 269 are mounted and a chain 271 is trained around the element 269 and a sprocket 273 on the shaft 275.

The pulley 211 for the belt 58 is driven by a sprocket chain 266 trained over sprockets fixed upon the shafts 264 and 268, and the shaft 264 also has fixed thereon a sprocket 281, connected by a chain 282 with a sprocket 283 upon the countershaft 285.

The cam 180, controlling the operation of the convoluting mechanism may be driven by means of a chain 270 which is trained over the sprocket 290, on the shaft 285 and a sprocket 277 mounted upon the cam shaft 272.

Figs. 1 and 2 of the drawings also show the cam 78 for the cutting mechanism as driven by a belt 280 directly connecting the rotating elements upon the shafts 272 and 279. It will be understood however that the driving connections referred to herein are merely illustrative and that the actual driving connections must be such as to properly coordinate the various components of the apparatus. The driving connections must be such as to operate these components in properly timed relationship so as to produce the results above described.

While the invention has been described with reference to the particular apparatus shown on the drawings it is to be appreciated that it is not limited thereto. It is rather of a scope commensurate with the subjoined claims and may involve apparatus in which there are some variations or modifications of one or more of its components, within the scope of the claims.

What is claimed is:

1. In a machine for making small diameter rolled paper rods for use as confection sticks, a convoluter acting upon paper strips to form loosely wound rolls, transfer mechanism including a primary compacter acting upon said rolls, a secondary compacter including a conveyor receiving the rolls directly from the discharge end of the primary compacter, and transfer means at the receiving end of the secondary compacter for guiding the rolls from the primary compacter to the secondary compacter without permitting any substantial unwinding of the rolls.

2. Apparatus for forming confection supporting sticks in each of which a single strip of paper is wound upon itself, comprising, in combination, means feeding a master strip of paper from a supply roll, severing means cutting the paper into stick strips of uniform length, means for advancing the severed stick strips, guide means

acting upon the leading edge of successive stick strips to initiate the curling of the strips in a convoluting zone defined in part by the guide means, stationary means defining other parts of the convoluting zone, a moving convoluter frictionally engaging the leading edge of the curled up strip to initially free it from contact with said stationary means, said convoluter having strip contacting parts moving through a closed path at a speed not less than the speed of advance of the strip, means for releasing each stick strip from the convoluting zone as soon as it is completely convoluted to form a loose roll, means for subsequently compacting the roll and holding it in compacted form until the paper takes a set sufficient to maintain its roll formation, and thereafter bonding the two outermost convolutions so that a self-sustaining rigid confection stick is formed.

3. The method of forming tightly rolled paper confection sticks comprising the feeding of paper sections to a convoluting zone, rolling up the sections successively within a convoluting chamber of substantially circular cross-section to thereby form loosely wound cylinders, releasing said cylinders from said chamber, and simultaneously transferring them to a compacting zone while preventing the unwinding of the cylinders, rolling the cylinders in such a manner as to increase the number of their convolutions, maintaining pressure upon the cylinders during said rolling so that they become compacted rolls, transferring the compacted rolls directly from the compacting zone to a sealing and bonding conveyor while limiting their unwinding to a slight degree, and re-rolling and further compacting and sealing the rolls so that they will thereafter hold their convolutions in a tightly wound paper confection stick.

4. The manufacture of confection sticks comprising feeding a master paper strip from a supply roll, severing the master strip into stick strips of uniform length during the unrolling of the supply roll, curling the leading edges of successive stick strips by the movement of the edges into a convolution zone, subjecting at least a part of the outside convolution of the curling stick strip to a friction relieving action during the curling, continuing the friction relieving action during substantially the entire time that each stick strip remains in the convolution zone, continuing the curling and convoluting until a relatively large diameter tubular roll is formed, releasing the loosely convoluted tubular roll from the convolution zone while the following edge of the strip is moving in that zone, applying a bonding agent to the strip material subsequently increasing the number of convolutions and correspondingly decreasing the diameter of the tubular roll until a substantially solid and rigid confection stick is formed with its successive convolutions permanently bonded.

5. In a confection stick forming apparatus, means for unwinding a master paper strip from a supply roll and advancing the strip at a predetermined speed, severing the master strip into stick sections means for arcuated guiding a leading edge of the paper of each successive section to curl it and initiate the winding up of severed sections of the strip to form tubular rolls of relatively large diameter, means acting upon the curled edges of the sections and their successive convolutions while the loosely wound tubular stick rolls are formed within a convoluting zone,

said means facilitating the change of successive strip sections into convoluted form, means releasing the loosely wound tubular rolls from the convolution zone, and means further convoluting the tubular rolls and thereby increasing the number of their convolutions and compacting them into substantially solid confection sticks of a diameter, much less than that of the tubular rolls.

6. In a machine for manufacturing substantially solid confection sticks from a rolled up paper master strip, comprising, in combination, paper feeding means, strip severing means cutting the master strip into stick strips of uniform length, convoluting means exerting a pull on the severed stick strips and forming them successively into loosely wound tubular rolls of relatively large diameter, said convoluting means including rotating members freeing the leading portion of each convoluting stick strip of frictional resistance, and means continuing the convoluting action to increase the number of convolutions of the tubular rolls and compact them and bond their successive convolutions into substantially solid permanent confection sticks of a diameter much less than the diameter of the tubular rolls.

7. Apparatus for forming rigid paper confection sticks in each of which a single strip of paper is wound upon itself, comprising, in combination, means feeding a master strip of paper from a supply roll, severing means cutting the master strip into stick strips, a releasable guide acting upon the leading edge of the moving paper to initiate bending of the paper in a convoluting zone defined in part by the guide, a convoluter successively frictionally engaging the leading edges of the stick strips and operating in the direction of movement of said leading edges at a peripheral speed not less than the advance of the stick strips to facilitate convolution of the paper and the rapid formation of loosely wound tubular stick rolls in the convolution zone, and means simultaneously compacting and bonding the tubular stick rolls beyond the convolution zone, said compacting and bonding involving an increase in the number of convolutions of each tubular roll and a substantial decrease in the diameter of each roll until substantially solid confection sticks are produced thereby.

8. A method of forming tightly rolled paper confection sticks from paper supply rolls, comprising feeding the paper from the supply roll through cutting and convoluting zones, severing the paper into strips of uniform and predetermined lengths so as to ultimately form confection sticks of the desired diameter, convoluting the paper into loosely wound tubular rolls of relatively large diameter while freeing the leading edges of the strips from frictional resistance, separately acting upon the loosely convoluted tubular rolls to increase the number of their convolutions and ultimately compact them into substantially solid sticks and to bond the successive convolutions into an integral unit.

9. In apparatus for the manufacture of confection sticks, a rotatably mounted paper supply roll, main feeding means for continuously unwinding the paper from said roll at a constant speed, intermittently operating paper cutting means severing the paper into uniform stick sections, intermittently operable auxiliary feeding means advancing the paper to the cutting means while the latter is inoperative, said feeding means remaining stationary while the cutting means is

operative, means for maintaining the paper under tension while preventing disarrangement of the paper during the constant operation of the main feeding means and the intermittent operation of the auxiliary feeding means, convoluter means for loosely rolling up the stick sections subsequent to their release from the cutting means, said convoluter means including driven rollers directly contacting the paper, a dry compacter conveyor operating upon the loose rolls after their release from the convoluter to wind up and compact the rolls sufficiently to cause them to become set to a considerable degree, and a bonding compacter conveyor receiving the rolls directly from the dry compacter and bonding them into closely compacted self sustaining rolls.

10. In apparatus for the manufacture of rolled paper supports for confections, means for convoluting paper strips to form loose tubular rolls of relatively large inside diameter, compacting means acting upon said rolls immediately upon their release from the convoluting zone to form substantially solid rods of outside diameter less than the inside diameter of said tubular rolls, bonding and sealing means acting upon the rolls upon their release from the compacting means, and transfer means effecting the movement of the rolls from the compacting means to the bonding means without any substantial amount of unwinding of the rolls.

11. Apparatus for forming confection supporting sticks in each of which a single strip of paper is wound upon itself, said apparatus comprising, in combination, means feeding a master strip of paper from a supply roll, severing means cutting the paper into stick strips of uniform length, means for advancing the severed stick strips and initiating the convoluting or curling of the strips, driven means acting upon the outer convolutions of successive stick strips to facilitate the curling up of the strips into loosely wound rolls in a convoluting zone defined in part by said driven means, stationary means defining another part of the convoluting zone, said driven means having strip contacting parts moving through a closed path at a speed not less than the speed of advance of the strip, each loosely wound roll advancing from the convoluting zone as it is formed, and means for subsequently compacting the roll into a substantially solid rod and maintaining its compacted form until the paper takes a set sufficient to maintain its rod formation, and bonding the two outermost convolutions so that a self sustaining rigid confection stick is formed.

12. The method of forming slender and rod-like confection sticks of convoluted paper, said method comprising the feeding of paper sections to a convoluting zone, rolling up the sections successively within a convoluting chamber to thereby form loosely wound cylinders, advancing said cylinders from said chamber, and simultaneously transferring them to a compacting zone while preventing any substantial unwinding of the cylinders, rolling the cylinders in such a manner as to increase the number of their convolutions, maintaining pressure upon the cylinders during said rolling so that they become compacted rolls, transferring the compacted rolls directly from the compacting zone to a sealing and bonding zone while limiting their unwinding to a slight degree, and re-rolling and further compacting and sealing the rolls so that they will thereafter hold their convolutions in a tightly wound paper confection stick.

13. In a machine for making substantially solid convoluted paper candy sticks of rod-like character and small pencil-like size, means presenting a convoluting chamber into which paper strips are advanced so as to be rolled up therein to form loosely wound tubular rolls; said means including a driven element having a surface contacting the material forming the outer convolution of each roll and moving in the direction of advance of the strip to facilitate the formation of the roll, and means for compacting the rolls into substantially solid small diameter candy sticks by further convoluting them, and bonding the outer convolutions.

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