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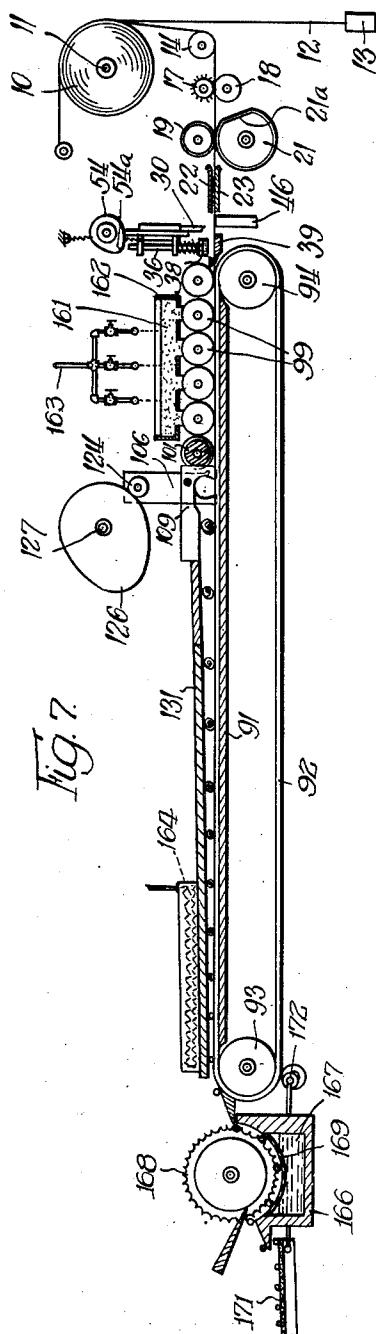
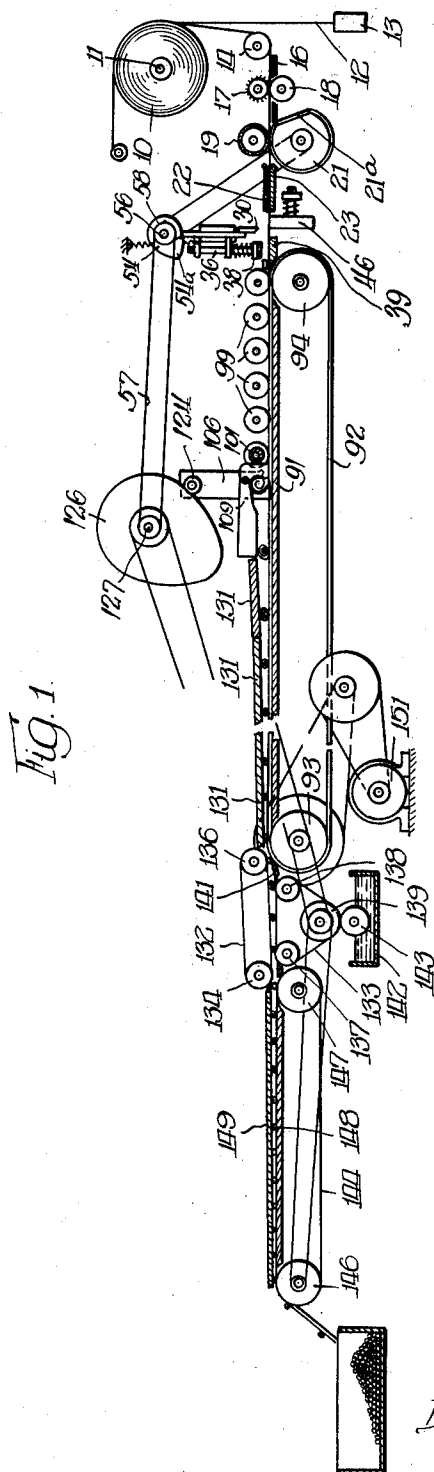
S. DECKER

2,218,525

METHOD OF AND APPARATUS FOR MANUFACTURING CONFECTION HOLDERS

Original Filed March 13, 1935

4 Sheets-Sheet 1



Inventor:
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Oct. 22, 1940.

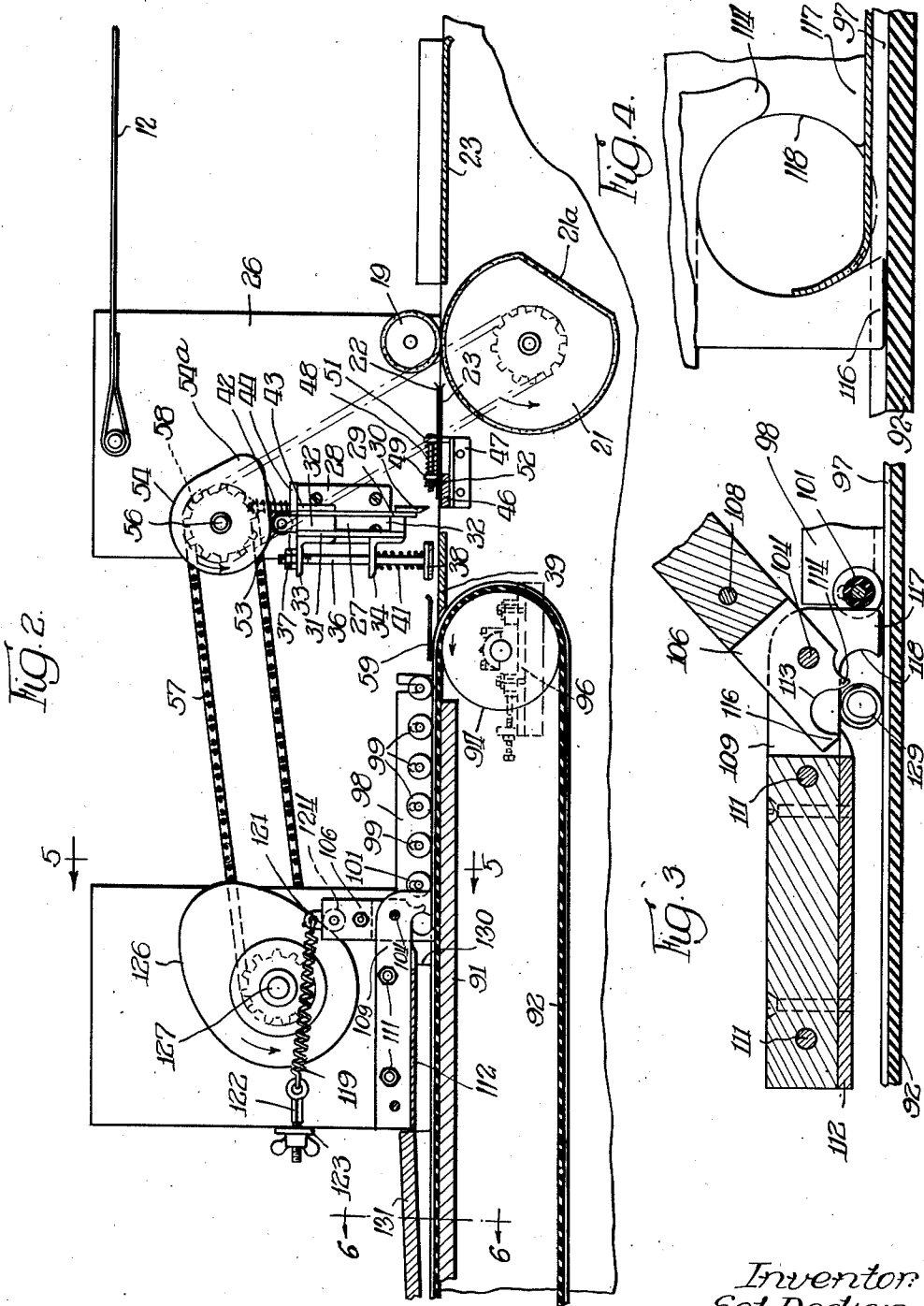
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METHOD OF AND APPARATUS FOR MANUFACTURING CONFECTION HOLDERS

Original Filed March 13, 1935

4 Sheets-Sheet 2



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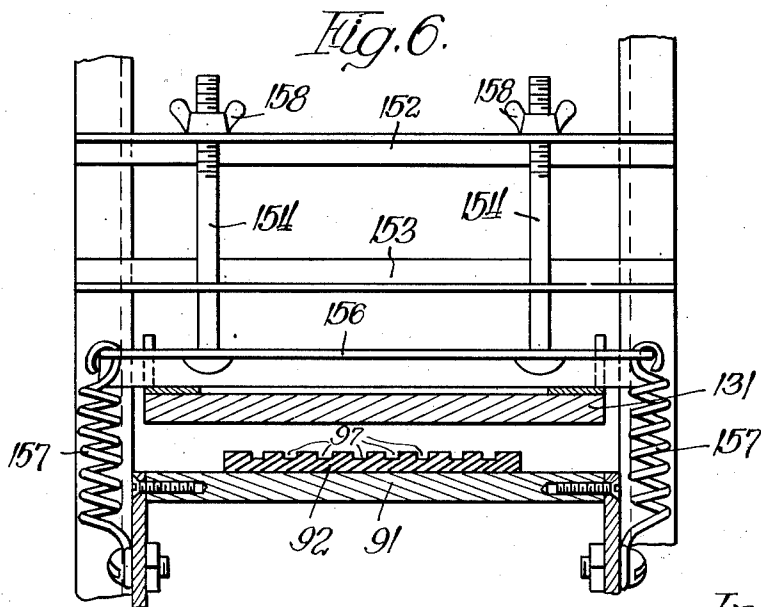
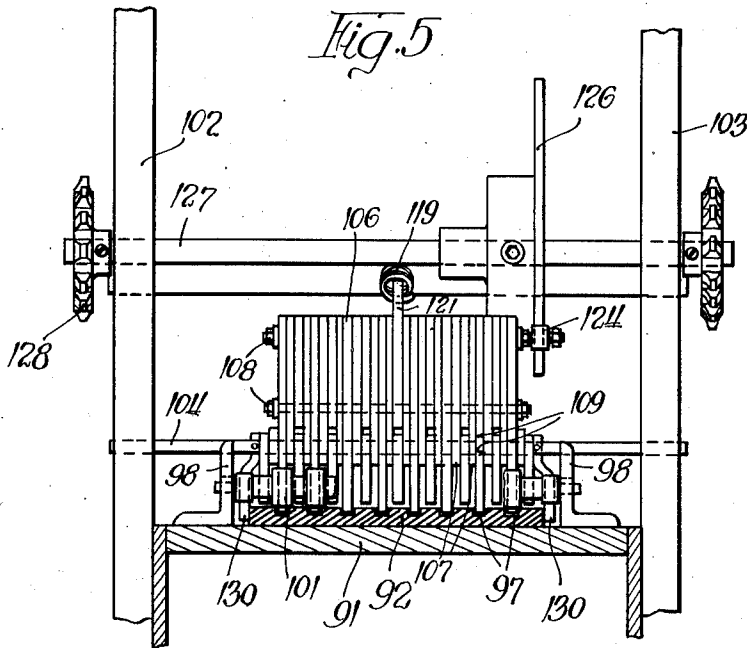
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Original Filed March 13, 1935

4 Sheets-Sheet 3



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Original Filed March 13, 1935

4 Sheets-Sheet 4

Fig. 8.

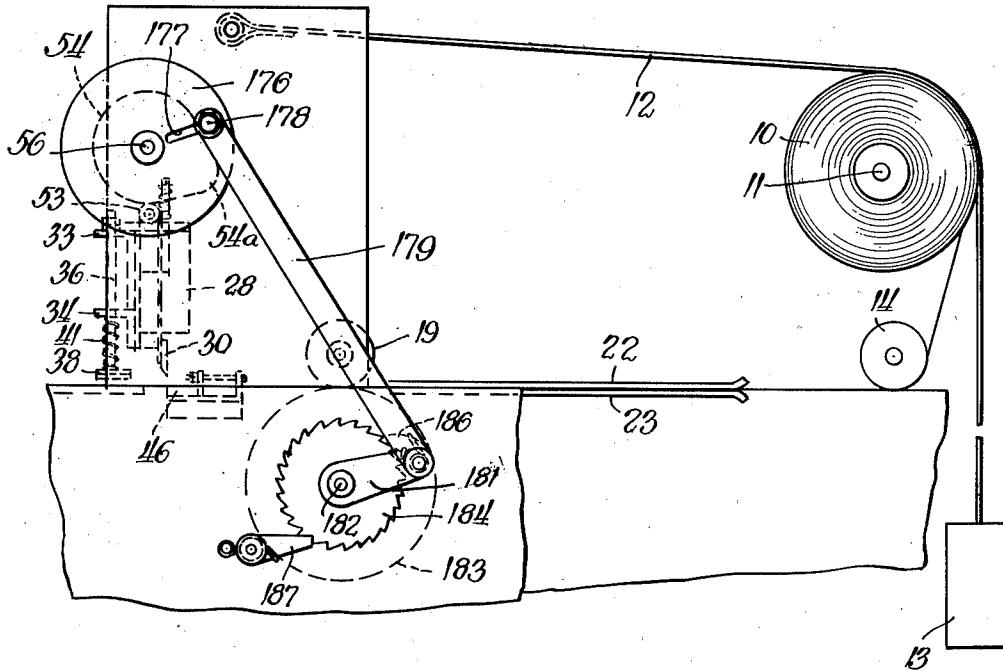


Fig. 9.

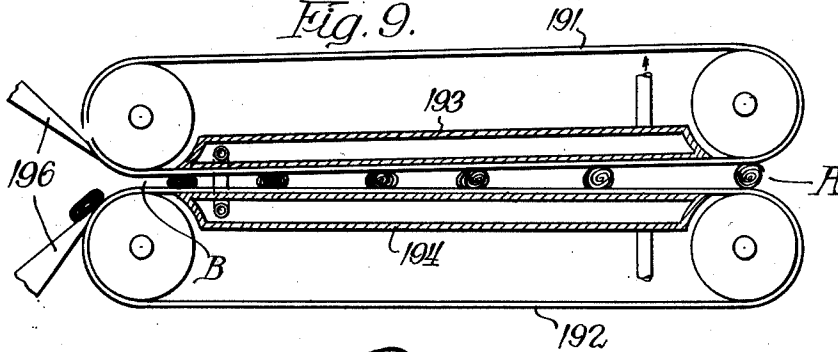
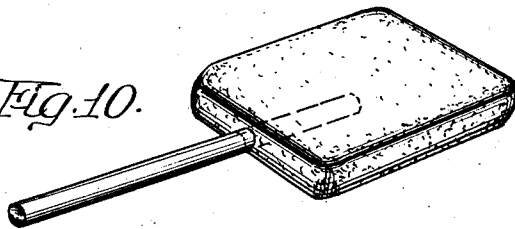


Fig. 10.



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UNITED STATES PATENT OFFICE

2,218,525

METHOD OF AND APPARATUS FOR MANUFACTURING CONFECTION HOLDERS

Sol Decker, Chicago, Ill., assignor to Setter Bros. Inc., Cattaraugus, N. Y., a corporation

Application March 13, 1935, Serial No. 10,809
Renewed June 21, 1939

21 Claims. (Cl. 93—1)

My invention relates in general to methods of forming articles out of paper and machines for carrying out these methods. It relates more particularly to the formation of a supporting stick for a confection and also to the product utilizing the stick.

Many confections are mounted upon supporting or impaling sticks, heretofore usually made of wood. Many suggestions have been made relating to the use of some other form of support, but heretofore no fully satisfactory article has been produced. Among the supports which have been proposed are metal and rope. The difficulty has been in part the disadvantages inherent in the proposed articles, their increased cost resulting from the fact that no suitable equipment has been made to manufacture them, and also the difficulties incident to assembling them with confections.

A successful confection must be capable of being produced relatively inexpensively, should possess the desirable properties of the wooden stick when actually assembled with the confection, and should be capable of use with the usual types of automatic or semi-automatic machinery for assembling the stick and the edible portion of the confection.

One object of my present invention is the provision of a method of, and means for, producing supports or sticks adapted for use in the confection industries.

Another object is the provision of an improved method of, and means for, producing rolled paper articles.

A further object is the provision of a method of, and means for, producing paper supports having desired degrees of flexibility or resistance to breaking.

Other objects and features of the invention will be apparent from a consideration of the following detailed description taken with the accompanying drawings, wherein:

Fig. 1 is a longitudinal, elevational view partly in section showing one embodiment which the invention may take;

Fig. 2 is an enlarged sectional view partly in elevation showing certain features of the machine;

Fig. 3 is an enlarged sectional view partly in elevation showing a portion of the mechanism illustrated in Fig. 2, but illustrating a modified position thereof;

Fig. 4 is a further enlarged view showing the manner in which the paper is handled to initiate the formation of the loosely wound rolls;

Fig. 5 is a slightly enlarged sectional view taken

on the line 5—5 of Fig. 2, looking in the direction of the arrows;

Fig. 6 is a fragmentary sectional view taken along line 6—6 of Fig. 2 looking in the direction of the arrows and showing a detail of the machine;

Fig. 7 is a longitudinal, elevational view partly in section showing a modification of my machine wherein the mechanism for handling and treating the paper is of a form variant from that shown in Fig. 1;

Fig. 8 shows a modified arrangement for feeding the paper;

Fig. 9 shows means for modifying the cross-sectional shape of the finished article; and

Fig. 10 shows one form of the article employed as a support for a confection.

In describing the invention I shall first refer to the mechanism employed. Generally the machine comprises means for delivering paper or other fibrous or similar sheets to a set of "fingers" which initially impart a rolled or convolute configuration to the rectangular sheet. According to my preferred method the paper is prepared in rolls of the proper width and delivered to a cutting mechanism designed and adjusted to cut the sheets into the length desired. Sheets wider than the length of the stick to be formed may be used and the sticks cut to length after being formed. The paper passes with a belt under a set of rollers for delivery to convoluting mechanism. The "fingers" of this mechanism form an enclosure having a circular portion in extent over 180 degrees (preferably about 345 degrees), into which the end of the paper is delivered. Continuous forward movement of the paper causes it to roll up within the generally circular enclosure formed by the "fingers" to produce a relatively loose roll, the "fingers" preferably relaxing as the paper is fed thereto to permit more facile introduction of the paper as it rolls and increases in diameter. This roll is then ejected from the "fingers" and delivered to a convoluting or compacting mechanism in which two plane surfaces have relative movement with respect to each other. In a preferred embodiment this mechanism includes a belt and a stationary member cooperating with the belt with respect to which the belt has relative movement, to continuously roll the formed paper in the direction in which the belt is moving. The space between the belt and cooperating member narrows toward the delivery end so that the rolled paper is gradually decreased in diameter until it is wound tightly enough to suit the purpose.

The roll is secured together with adhesive, ac-

cording to one of several methods. The rolled body may be of circular cross sectional shape, or it may be flattened to produce a "flat" stick, this flattening operation taking place after the adhesive has been applied.

Referring now to Fig. 1, I show a roll of paper 10 rotatably supported on a mandrel 11 with a friction member 12, here shown in the form of a strap, engaging the paper and held with a weight 13 to apply the requisite tension to the paper. A pair of co-acting perforating members 17 and 18 may be employed to put a line of perforations along the paper at a selected point for a purpose which will be hereinafter described. Thence the paper passes between rollers 19 and 21, the latter positively driven and having a cut-away portion 21a by means of which the forward movement of the paper is interrupted. Other types of paper-feeding mechanism may be substituted. Thence the paper is delivered between a pair of guides 22 and 23 to a cutting mechanism.

The machine has a longitudinally extending framework, only a portion of which is shown in the drawings, as a full view thereof is not necessary to a full understanding of the structure.

Referring now to Fig. 2, an upright plate 26 is secured to the main frame, there being one plate 26 at each side of the machine. Each plate 26 has a pair of narrow upright plates 27 and 28 secured thereto in such a way as to form a guideway in which a knife body 29 is vertically slidably supported. The knife body 29 has a knife blade 30 secured to its lower edge. A plate 31 is supported parallel to the knife body 29 by blocks 32, the knife body 29, plate 31 and blocks 32 moving together as a unit. A pair of angle irons 33 and 34 project from the plate 31 and a plurality of rods 36 extend vertically through apertures provided in the two angle irons. The tops of the rods are threaded to receive nuts 37 which position the lower ends of the rods. A foot 38 carried by the rods is also positioned with respect to the paper moving along plate 39 and is adapted to engage the paper to hold it stationary during the cutting operation. The springs 41 are disposed between the lowermost of the two angle irons and the foot 38 to hold the foot resiliently against the paper.

The knife is held in its uppermost position by a pair of springs 42 (one spring appears in the drawing), which extend around upwardly extending posts 43 carried by the knife assembly. One end of each spring engages a stop carried by the posts and the other end engages a plate 44 carried by the upright frame plate 26.

Cooperating with the knife blade 30 is a straight edge 46 in the form of a metal bar positioned immediately beneath the paper and running the length of the knife. The straight edge 46 rides on a pair of angle irons 47 (one being shown on Fig. 2) secured to the main frame of the machine. A spring 48 is compressed between a pair of lugs 49 and 51 carried by the straight edge and angle irons 47 respectively, the spring being held in position by a bolt 52. The nuts secured on the bolt afford a means for adjusting the position of the knife cooperating straight edge.

Above the knife assembly is a roller 53 journaled on a stub shaft carried on a pair of up-standing lugs carried by the blocks 32. This roller rides against a cam 54 secured on shaft 56.

The shaft 56 is driven through a chain 57 and a sprocket gear 58 carried on the shaft. The drive train from the source of power to the chain 57 will be described further hereinafter.

The operation of the cutting mechanism appears clear from the description thereof. Briefly, however, the paper in strip form is fed between the guides 22 and 23 below the knife and onto the plate 39 and below guide 59. At the time forward movement of the paper is arrested, as for example when the cut-away portion 21a of the feed roller reaches the upper position, the cam 54 reaches a position where the portion 54a engages the roller 53 and moves the entire knife assembly downwardly. The foot 38 now engages the paper and holds it tightly against the plate 39 to avoid any possibility of movement thereof during the cutting operation. The knife, immediately after the foot comes in firm contact with the paper, engages the paper and, cooperating with the straight edge 46 in scissors fashion, cuts the paper off exactly at right angles to the longitudinal edges thereof (assuming a roll with two blunt ends is to be formed). As the knife assembly moves upwardly and the paper is disengaged by the foot 38, the severed sheet is permitted to move forwardly through the machine by reason of the movement of belt 92 and the feed mechanism again advances the paper preparatory to cutting off another sheet. This action is continuous and rapid, with only a momentary stop for the cutting operation.

From the cutting mechanism forward the machine has a long metal base plate 91 over which a belt 92 passes. This belt is carried on rollers 93 and 94 supported on shafts suitably journaled in the frame, as shown in Fig. 2 at 96. Suitable bearings and belt tensioning means are provided as indicated. In this connection it should be noted that the belt must travel in a directly straight path in order to assure a uniform and accurate rolling operation of the paper to produce the stick. The belt 92 is provided with a plurality of grooves 97 (see Fig. 5) the nature and function of which will be described later. At opposite sides of the machine bearing plates 98 (Fig. 2) are provided supporting a plurality of rollers 99, which hold the paper flat against the belt 92. At the extreme lefthand ends of the bearing plates 98 (looking at Fig. 2) a sectional roller 101 is provided. This sectional roller is provided with a plurality of spaced peripherally cut out sections as is clearly shown in Figs. 1, 2, 3 and 7 and more particularly illustrated in Fig. 5. Spaced parts of the roller fit into the spaces between fingers 109 and insure proper feeding of the paper into the roll-forming space.

In the drawings I show the bearing plates 98 as angle irons secured to the base plate 91 (see Fig. 5). They may, however, be secured to any suitable portion of the frame.

Secured to opposite sides of the frame are upright plates 102 and 103 (Fig. 5) with a pivot bar or rod 104 secured between them parallel to the belt 92 and directly at right angles to the direction of movement of the belt. Pivoted on the rod 104 are a plurality of "fingers" 106, with spacers 107 between them, the spacers and "fingers" being tied together to form an integral or unitary body. Between each pair of "fingers" 106 are cooperating "fingers" 109 (Fig. 3), these "fingers" 109 also having spacers between them and secured together by rods 111 suitably secured at the outside edges of the "fingers" to produce substantially unitary or single assembly. Beneath

the "fingers" 109 a plate 112 is secured in spaced relation to the belt 92 but generally parallel thereto.

The "fingers" 106 are formed with semicircular end recesses 113 and with projections 114 and 116 integral with the "fingers" and forming the end-
 5 portions of the semi-circular recesses 113. The "fingers" 109 are provided with a right-angular extensions 117, with a generally semicircular portion 118 between the extensions 117 and the
 10 "fingers" proper. When the "fingers" 106 are in normal position as shown in Fig. 4, the portions 116 extend into the longitudinal slots of the belt 92, thereby putting the lowermost portions
 15 of these "fingers" below the level of the paper supported on the belt. As seen in Fig. 4 also the "fingers" taken together complete the major portion of a circle with the top belt line slightly
 20 cutting into the circle as a chord thereof. Accordingly when the paper is moving forwardly by the belt and kept from buckling by the roller assembly disposed immediately in advance of the
 25 "fingers," the entire sheet of paper is caused to roll up within the generally circular space provided by the two sets of "fingers." The movable set of "fingers" 106 relax slightly as the paper enters to allow for increasing the diameter of the rolled body.

The "fingers" 106, secured together to form
 30 a composite assembly approximately the width of the paper or slightly wider, are normally held in an upright position by a tension spring 119. One end of this spring is secured to an ear 121 projecting from one of the spacers and the opposite
 35 end is secured to an adjustable eye-bolt assembly 122 carried on a cross arm 123. The tension of the spring 119 can accordingly be adjusted.

The uppermost tie-rod 108 extends from the assembly and carries a roller 124 which engages
 40 a cam 126. This cam is carried on a shaft 127 driven by a sprocket gear 128 (see Fig. 5) from a suitable source of power. The cam 126 is so positioned, shaped and timed with respect to the movement of the paper that as the paper enters
 45 the area between the "fingers," the movable set of fingers is allowed to move slightly but gradually to accommodate the increased diameter of the roll; and when the last of the paper sheet has been fed to the "fingers," the finger assembly,
 50 including the "fingers" 106 is caused to rotate about the pivot rod 104 to the position illustrated in Fig. 3. When moving to this position the portions 114 of the "fingers" 106 engage the rolled
 55 paper indicated at 129 (Fig. 3) and, assisted by the movement of the belt 92, eject the rolled paper body from the "fingers." Thence this paper body moves along with a rolling movement between the belt 92 and the plate 112 carried by
 60 the fixed finger assembly 109. The entire mechanism is timed so that when the "finger" assembly is returned to its initial position another sheet of paper is immediately delivered thereto so that
 65 there is no loss of time except the short space during which the rolled body is being released. This occurs during the time in which the paper sheet is being severed from the continuous strip. In the operation of the "fingers" there is at times
 70 a tendency for the paper to slip sidewise and form a body with one pointed end and one hollow end. Guides 130 carried by the stationary finger assembly engage the side edges of the belt and keep the fingers and belt in line, thus at all times feeding the paper in a direct line, and insuring
 75 proper positioning of the moving fingers 106 and

more especially the projection 116 thereof with respect to the grooves 97 in the belt 92.

Above the belt 92 and extending toward the pulley 93 are a plurality of top plates 131 supported suitably on a portion of the frame to permit
 5 adjustment thereof. A single plate of greater size can be used if desired. These plates are so positioned as gradually to decrease the space between the belt and the plate, thereby causing the rolled body of paper to be decreased
 10 in diameter until a roll of the proper tightness has been produced. I may produce a roll having a relatively large central opening whereby a truly tubular body is produced or the central opening
 15 may be decreased to such an extent that the formed roll is substantially a solid body. Rolled sticks produced in this manner and properly
 20 bonded together may be formed having substantially the hardness, toughness and resistance to bending of a high-grade wooden stick, or the
 25 formed sticks may be relatively flexible, the flexibility being controllable in accordance with the product desired. The sticks are superior to a high-grade wooden stick, however, because they
 30 will not splinter or break at an angle or produce a sharp break which might cause injury. When scored or perforated, they are provided with a
 35 weak point which will readily break if more than normal stress is applied. If desired, they may be scored or perforated in a plurality of places
 40 to form a plurality of weak points while still being substantially rigid when used in the ordinary way. Further, they do not warp readily if they become wet, and will not lose their finish and
 45 have a splintery outer surface if exposed to water as a wooden stick frequently will.

The mechanism heretofore described will roll the paper rapidly into stick or tubular form. Heretofore, however, I have not described any
 50 method of bonding the paper together. This may be accomplished in a number of ways, one of which is illustrated more or less schematically in Fig. 1. Forward of the plate 131 and the belt
 55 92, I provide a pair of belts 132 and 133. The former is secured between a pair of pulleys 134 and 136 and the latter between pulleys 137, 138 and 139, forming a generally triangular shape. A short base plate 141 is interposed between
 60 a portion of the belt 132 and the beginning of belt 133 to feed the rolled paper bodies to a point between the belts. The space provided is somewhat larger than that at the end of the initial
 65 rolling mechanism whereby to allow the rolled body to spring open somewhat to facilitate application of an adhesive. Below the pulley 139 I provide a body of adhesive in a feed tank 142
 70 with an idler ductor roller 143 engaging the belt 133 where it passes over the pulley 139. By this means, a layer of adhesive is applied to the belt 133 and this adhesive is conveyed to the bodies
 75 as they move along between the two belts. The belt 133 is caused to move somewhat faster than belt 132 so as to provide a comparative movement between them such that the rolled bodies will be advanced continuously. The position of the belt and feed roller may be adjusted to control the amount of adhesive applied.

Forward of the belt of the adhesive applying belt mechanism, I provide another belt 144, tensioned between pulleys 146 and 147 and provided
 70 with a base plate 148 positioned underneath the top portion of the belt. A plate 149 is suitably adjustably supported by the frame structure above the belt in the same manner as shown with respect to the adjustment of plates 131 or in any
 75

other desired manner to gradually decrease the diameter of the rolled paper as it moves along between the belt and plate. The plate 149 may be broken into sections for simplifying adjustment or manufacture, if desired. It is understood that any relatively moving surface, such as a belt, may be used in place of plate 149.

The drive for the mechanism illustrated in Fig. 1 and associated views has not been described in detail. The drive, however, may be from a central motor 151 with suitable belting, chain drives or other drive connections to the various parts, suitable gear reductions and the like being employed to time the various operations in the manner and for the purpose of producing the functions described.

In Fig. 6, I illustrate a means for adjusting and positioning the plates 131. A pair of angle irons 152 and 153 are carried by side plates secured to the frame, through which bolts 154 extend loosely. The heads of the bolts engage an angle iron 156 secured to the plate 131 by locking bolts (not shown) or in any other suitable manner. Springs 157 hold the plate down at a point determined by the adjustment of wing nuts 158 on the bolts 154. By this means, plates 131 are held down with ample force to engage the rolled paper body suitably, but if there should be a "pile-up," due to faulty action of any part or use of improper paper, or for any other reason, the springs will give and permit the belt to carry away the piled-up paper. In general, this method of support is not required except that it provides a simple way of relieving a pile-up without disturbing the set adjustment of the plates.

In the modification shown in Fig. 7, the paper is given a preliminary treatment before being delivered to the machine. Since the major portion of the device shown in Fig. 7 is similar to that shown in Fig. 1, only the modified portion will be described, and those parts which are the same are given the same reference characters as in the main embodiment.

In the modification, I show an absorbent material 161 supported in a pan 162 supplied with aqueous liquid through a pipe system 163 capable of adjustment to deliver the proper amount of liquid substance. The absorbent material which may be felt, sponge, brush bristles, or similar substance, projects down through the pan 162 and engages the rollers 99. The paper may be moistened by this means, or it may be treated with suitable material in solution. Adhesives may be applied at this point and, if desired, with some types of adhesives, suitable space may be allowed for drying after application, or special drying means such as heat and air movement may be used. Above one or more of the plates 131, I provide a heating element 164 which heats the plate 131 to dry the paper or produce a bonding action, as when a thermo-plastic adhesive is used, or secure other results as will appear from further portions of the description. The heating element is illustrated as of electrical character employing resistance elements which produce heat by the passage of an electrical current there-through. It is understood, of course, that I may employ any suitable source of heat, such as a gas flame, steam, hot vapors, gasoline torches, or, in fact, any of the usual types of heating means employed in the various industries.

When the paper is formed on the type of mechanism shown in Fig. 7, the rolled body may be caused to retain its shape after delivery from the belt 92. I show, however, a mechanism for coat-

ing the rolled body with a suitable substance such as wax, for example. A tank 166 supports the coating liquid 167, and a longitudinally grooved roller 168 suitably driven extends over the tank in spaced relation with a higher screen 169 extending below the level of the liquid. The sticks are delivered to the segmented roller, pass through the coating liquid and are delivered onto a screen 171. This screen is adapted to be shaken by a shaker mechanism operated from an eccentric 172. The screen is slanted so as to cause the rolled bodies to progress along the screen while they are drying.

In order to conserve space, Figs. 1 and 7 are shown somewhat schematically, but the essential portions thereof are shown in detail in the remaining figures. In some instances, the actual structure is shown slightly different in Fig. 1 in order to conserve space. As an example, the straight edge cooperating with the knife, as shown in Figs. 1 and 7, is slightly different and is positioned so as to have the same function. It will also be noted that the straight edge is also shown slightly differently in Figs. 1 and 2.

The operation of the machine as a whole should be clear from the description of the operation of the various parts thereof. However, I have not referred fully to all of the different means which I may employ for bonding the rolled body together. A sized paper may be bonded together readily by the application of a small amount of moisture with or without the application of heat, and, in this case I consider the moisture as a bonding agent. Some sized papers may be bonded even though moisture is not applied, while some unsized papers, if first tempered, may be bonded directly into suitable bodies for some purposes. In these cases, however, I prefer to apply a coating which produces a more finished appearance to the completed article. I may also coat the paper with an adhesive before rolling it, and such adhesive may be either one which sets up by the application of small amounts of moisture, in which case the pan 142 shown in Fig. 1 will contain water. I may also employ adhesives which will set up by the mere application of heat. For this reason it is obvious that the adhesive applying mechanism shown in Fig. 1 and the coating applying mechanism shown in Fig. 7 may be dispensed with in many instances. These modifications, however, I consider necessary in order to have a full control over the character of the final product produced. Dextrine, gelatine, a mixture of gelatine and sugar, some of the common gums and other adhesives of this character, may be employed to produce a relatively flexible stick, that is, a stick which will very easily support a confection without bending, but which will bend when an unusual strain is imparted to it. This type of stick may be assembled with confections such as candy by utilizing the method described in my co-pending application Serial No. 6,626, filed February 15, 1935. For producing a very hard stick, other types of adhesive substances may be employed, although even those mentioned for producing a relatively more flexible stick may also be used under suitable conditions to produce a stick with considerable rigidity. Rigidity may be controlled not only by the character of the adhesive but also by the amount thereof that is used and the manner of application. If the paper is first coated with the adhesive on one side or if in any other suitable way, such as applying the adhesive continuously to the paper as it is delivered to

the forming mechanism, an adhesive extends entirely to the core of the formed body, greater rigidity will result than if only the outside convolutions are provided with adhesive. Rigidity

5 may also be controlled by controlling the tightness of the rolled body. For example, a stick having $\frac{3}{8}$ " outside diameter rolled substantially tight, has more resilience than a stick of the same diameter shaped as a tube.

10 Whether the stick is made relatively rigid or relatively more flexible, the scoring or perforation described may be utilized to form a weak point therein as a safety measure.

Before describing further features of the stick, I shall refer to a modified paper feeding mechanism as shown in Fig. 8. The shaft 56 carrying the knife controlling cam 54 is provided with a disk 176 having a slot 177 in which a pin 178 is adjustably supported. This pin extends loosely through one end of a feed rod 179, the opposite end of which is loosely connected to the outside of a crank arm 181 pivoted to a shaft 182. A feed roller 183 journaled on the shaft 182 has a ratchet gear 184 mounted to turn therewith. A spring-pressed pawl 186 carried by the feed arm 181 engages the ratchet gear 184. As the shaft 56 rotates, the feed rod 179 is reciprocated and the roller 183 is rotated a distance corresponding to the throw of the arm 181. A fixed pawl 187 prevents back movement of the feed roller assembly, and since the feed roller 183 and the top roller 19 are in contact with the paper at all times, there is no possibility of slippage. By adjusting the position of the pin 178, the length of throw and therefore the width of the sheet fed may be controlled.

At times it is desirable to produce a rolled paper body or stick which is of relatively flat cross section. In Fig. 9, I illustrate a mechanism for producing a relatively flat stick. This mechanism comprises a pair of belts 191 and 192, preferably of relatively thin metal and trained around suitable pulleys. The belts are driven together at uniform speed, and adjacent portions are almost parallel to each other, except that from position A to position B, the distance between the belts gradually decreases. Plates 193 and 194 are positioned in contact with the far side of each of the belts 191 and 192 respectively so as to hold the belts in a straight line throughout their length. These plates 193 and 194 are adapted to be heated, as for example by providing an open space as shown for the admission of steam, the temperature of which can be controlled to suit conditions. In place of plates, other suitable backing means may be substituted for the belts such as a series of rollers, it being merely necessary to prevent the belts springing apart when the rolled paper bodies are delivered between them. As indicated, the rolled paper bodies pass into the space between the belts near the point A and are delivered at the point B, being gradually flattened as they progress onwardly. Scrapers 196 are provided for removing the formed bodies from the belts.

The sticks are fed between the belts in a round condition as they are delivered from the portion of the mechanism which imparts the circular rolled formation thereto, and the sticks are either conveyed directly to the mechanism shown in Fig. 9, or they are stored or further treated before being delivered to this mechanism. In general it is preferred that the sticks be somewhat readily compressible at the time they are delivered to this mechanism, as for example, they may be

somewhat moist; they may contain some unevaporated solvent; they may have a body of thermoplastic adhesive which has not yet set, or they may be in still other conditions to facilitate the flattening action. Although in general imparting the flat shape tends to decrease the strength of the stick in one direction, I find that the close bonding together of adjacent flat portions of the paper has considerable stiffening action.

I can, if desired, make the sticks of substantially any simple cross sectional shape by the use of suitable die mechanism through which the stick can be forced, for example by passing the stick through a die or series of dies, but which gradually takes a square or generally triangular cross section; for example, the stick may be caused to "set up" into the shape possessed by the final portion of the die. I have not illustrated mechanism for accomplishing this result, as it appears obvious that those skilled in the art can readily construct suitable forming equipment of the general character described. As in the case of making the flat stick, when the pre-rolled stick is delivered to the forming mechanism, it should be in a condition in which the form is rather readily modifiable to take the shape desired.

The mechanism described for rolling the stick body, if properly adjusted, may be employed to produce a stick having two blunt ends. This stick, as previously noted, may be of the length desired, or it may be made relatively long and subsequently cut to proper length. The cut ends will also be blunt, that is the cut edge will be a plane at right angles to the axis of the stick. By proper control, however, I may produce a stick having a pointed end. For example, by using two feet 38 (see Fig. 2) and allowing one foot to disengage slightly before the other, the paper may be turned slightly sideways with the result that one end of the stick will be pointed when the completed article has been produced. By having a slightly greater distance between the belt and one side of the plate 131 I may also produce the same effect. Similarly, the paper may be cut to trapezoidal shape so that one end of the rolled body will be blunt and the other end will be pointed.

Many modifications of the product produced in accordance with my invention other than those outlined hereinabove may be produced by employing the equipment shown in the main embodiment of the invention or one of the modifications thereof. For example, substantially any color may be employed on the stick, readily produced by using a suitably colored paper. It is well known that no satisfactory method for coloring wooden sticks has ever been suggested. The paper employed may have a relatively flat color, if this should be desired, or it may be relatively of a very bright character, as for example, by using sized or enameled stock, by employing such papers as Cellophane and the like. Cellophane and other papers of this type are relatively thin and so in generally a relatively long sheet is necessary if a stick of substantial thickness is to be produced. I find, however, that it is a comparatively simple matter to deliver two sheets of paper together to the forming mechanism and roll them so that the Cellophane, colored or transparent, will be on the outside of the rolled body when finally produced. As an example, two rolls may be employed and the paper fed in with one strip above the other, advanced, cut off and formed in the same way as a single sheet of paper.

Sometimes to avoid slippage it is advisable to supply a very small amount of an adhesive between the two sheets as they come together. I may also form the sticks with advertising matter printed thereon, either on the outside or inside of the rolled body. It is very difficult to print satisfactorily on a wooden stick, but printed matter may be applied to the paper rather inexpensively and the paper rolled so that the printed matter will show on the outside of the stick. I may also print advertising matter and the like on the inside of the stick and use such an adhesive that the paper is readily unrolled after it is removed from a confection, for example, so that the advertising matter can be read. This is an advantage in permitting the use of flags, pictures, coupon or premium literature on the inside of the stick so as to promote sales, if desired. Flavoring may be incorporated by impregnating the paper therewith, or by placing the flavoring between convolutions.

One advantage of the mechanism described is that if desired a core or mandrel may be introduced into the center of the rolled body. For example, by extending a mandrel, such as a twisted paper fibre strand, into the space formed by the "fingers" as the paper sheet is rolled up, the paper sheet is rolled tightly about the core and a hard stick may be made. The degree of flexibility or hardness may, of course, be controlled.

It is understood that although my improved method and product is particularly directed to the making of supports for confections, the rolled paper body may have other uses, such as for dowel pins or the like. When the product is employed for some use other than as a support for a confection, there is, of course, no limitation as to the type of adhesive employed. When it is used as a support for a confection, however, the adhesive or substances such as dyes incorporated with the paper should be sanitary, non-toxic, tasteless and odorless and, in general, suited for the purpose intended.

It will be appreciated, in connection with the employment of advertising matter in association with the confection supports, that the outer convolutions only of such supports may be bonded. This bond may then be relatively easily broken and the support unrolled, and the advertising matter thus exposed.

Altho the sub-joined claims are limited to the illustrative apparatus and related methods of manufacture I do not dedicate to the public the other inventions described. They are claimed in my copending applications 189,846 and 310,382.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. The method of preparing supporting or impaling members for confections and the like from paper or similar material comprising relatively tightly rolling a sheet of the material to form a plurality of convolutions and to produce a substantially solid body, bonding said material by an adhesive substance or the like to prevent unrolling, and then subjecting the resulting roll to pressure to produce a relatively flat supporting member.

2. An apparatus for forming confection impaling or supporting members from paper or similar material comprising means for intermittently feeding a sheet of paper to a space substantially circular in cross section and formed by co-operating members, one of which is fixed and the other of which is pivoted whereby a relatively loose paper roll is formed, means for moving the

pivoted member to a position permitting the ejection of the loose paper roll, and means for increasing the number of convolutions in the roll and thereby decreasing its diameter, said last mentioned means comprising opposed spaced surfaces having relative movement therebetween, the distance between said surfaces gradually diminishing.

3. The method of producing pointed impaling or supporting members from paper or similar material which comprises feeding a trapezoidal or similarly shaped piece of the material into a space substantially circular in cross section, whereby the material is formed into a relatively loose roll, ejecting the roll, passing it between opposed surfaces having relative movement therebetween and the distance between which gradually decreases in the direction of travel of the roll whereby the number of convolutions in the roll is increased, and applying bonding material at any suitable stage in the process whereby unrolling is prevented.

4. The method of producing tightly rolled, substantially solid confection supporting or impaling members from paper or similar material which comprises forming a relatively loose roll of the material, increasing the number of convolutions in the roll and thereby decreasing its diameter by a rolling operation, then allowing the roll to slightly expand or loosen and thereupon applying bonding material thereto, and then continuing the rolling operation to reduce the diameter of the roll and produce a composite bonded roll.

5. The method of producing tightly rolled, substantially solid confection supporting or impaling members from paper or similar material comprising forming a relatively loose roll of the material, allowing the roll to slightly expand or loosen and thereupon applying bonding material thereto, and then subjecting the roll to a rolling operation to reduce the diameter of the roll.

6. In an apparatus for forming confection impaling or supporting members from paper or similar material, means for feeding a cut sheet of paper to a roll-forming mechanism, said mechanism comprising spaced fingers providing a substantially cylindrical confined space permitting a relatively loose paper roll to be formed therein, means for releasing the loose paper roll from confinement, and means for increasing the number of convolutions in said roll and thereby decreasing the diameter thereof, said means comprising spaced members the distance between which gradually decreases.

7. In an apparatus for forming confection impaling or supporting members from paper or similar material, the combination comprising means for intermittently feeding a sheet of paper to a space substantially circular in cross section and formed by two co-operating members one of which is fixed and the other of which is pivoted whereby a relatively loose paper roll is formed, and means for moving the pivoted member to a position permitting the ejection of the loose paper roll.

8. The structure described in claim 7, including means for increasing the number of convolutions in the roll and thereby decreasing its diameter.

9. In an apparatus for forming confection impaling or supporting members from paper or similar material, a conveyor belt along which the material is fed, said conveyor belt having spaced slots therein, a movable finger assembly comprising spaced finger elements which extend in part into the slots and below the general level of the

conveyor belt, and a fixed finger assembly comprising spaced finger elements, the fixed and movable finger assemblies co-operating to provide a substantially cylindrical space within which the paper is rolled to form a plurality of convolutions.

10. In an apparatus for forming confection supporting or impaling members from paper and similar material, the combination with a movable grooved or slotted paper carrier of means forming a space substantially circular in cross-section within which the material is rolled, said means comprising coating finger assemblies, one of which is stationary and the other of which is movable, the movable finger assembly having projections thereon adapted to fit within the grooves or slots of the carrier, and means to move the movable finger assembly to permit ejection of the paper roll.

11. An apparatus for forming confection impaling or supporting members from paper or similar material comprising means for intermittently advancing a sheet of paper to a cutting mechanism, means to cut said paper into desired lengths while preventing movement of said paper, conveyor means for advancing said cut sheets of paper to a roll-forming mechanism, said roll-forming mechanism comprising co-operating fingers providing a roll-forming space, means for progressively increasing the number of convolutions in the preformed paper roll and decreasing the diameter thereof to produce a substantially solid body, said last named means comprising upper and lower members, the space between which gradually decreases, and means for applying bonding adhesive material to the rolled paper.

12. An apparatus for forming confection impaling or supporting members from paper or similar material comprising means for intermittently feeding a sheet of paper to a space substantially circular in cross section and formed by co-operating members, one of which is fixed and the other of which is movable whereby a relatively loose paper roll is formed, means for moving the movable member to a position permitting the ejection of the loose paper roll, and means for increasing the number of convolutions in the roll and thereby decreasing its diameter, said last mentioned means comprising opposed spaced surfaces having relative movement therebetween, the distance between said surfaces gradually diminishing.

13. In an apparatus for forming confection impaling or supporting members from paper or similar material, the combination comprising means for intermittently feeding a sheet of paper to a space substantially circular in cross section and formed by two cooperating members one of which is fixed and the other of which is movable whereby a relatively loose paper roll is formed, and means for moving the movable member to a position permitting the ejection of the loose paper roll.

14. The structure described in claim 13, including means for increasing the number of convolutions in the roll and thereby decreasing its diameter.

15. In an apparatus for forming confection impaling or supporting members from paper or similar material, a conveyor belt along which the material is fed, said conveyor belt having spaced slots therein, a pivoted finger assembly comprising spaced finger elements which extend in part into the slots and below the general level of the conveyor belt, and a fixed finger assembly com-

prising spaced finger elements, the fixed and pivoted finger assemblies cooperating to provide a substantially cylindrical space within which the paper is rolled to form a plurality of convolutions.

16. The method of preparing supporting or impaling members for confections and the like from paper or similar material comprising providing a paper body having a coating of adhesive material thereon, forming a relatively loose roll comprising a plurality of convolutions of said paper, passing said roll between opposed surfaces, the distance between said surfaces gradually decreasing, whereby the number of convolutions of the roll progressively increases and the diameter of which progressively decreases whereby a substantially solid roll is formed, and treating said roll at any desired stage of the process to render effective the adhesive material whereby the paper is prevented from unrolling, thereby resulting in the formation of a relatively rigid composite rolled paper confection supporting or impaling member, said member, however, possessing sufficient flexibility to buckle or flex under undue deformation stresses.

17. Apparatus for the manufacture of substantially solid rolled paper confection sticks comprising, in combination, means for advancing a sheet of thin paper from a supply roll, means severing the paper into stick strips each of which ultimately forms a rigid confection stick of tightly rolled paper, convoluting means forming a relatively loose roll of each severed paper length, at least one component of the convoluting means functioning as a part of compacting means acting upon said loose roll to increase the number of its convolutions and decrease the diameter thereof to produce a substantially solid roll, said last mentioned means including elongated members determining the rectilinear opposed surfaces of a compacting passageway, and means including the compacting means for bonding the compacted roll to prevent unrolling, an endless conveyor constituting a part of the convoluting means and a part of the compacting means and continuously tending to move the rolls through the convoluting and compacting zones.

18. Apparatus for the manufacture of substantially solid rolled paper confection sticks comprising, in combination, means for advancing a sheet of thin paper from a supply roll, means severing the paper into stick strips each of which ultimately forms a rigid confection stick of tightly rolled paper, convoluting means forming a relatively loose roll of each severed paper length, at least one component of the convoluting means functioning as a part of compacting means acting upon said loose roll to increase the number of its convolutions and decrease the diameter thereof to produce a substantially solid roll, said last mentioned means including elongated members determining the opposed surfaces of a compacting passageway, and means including the compacting means for bonding the compacted roll to prevent unrolling, an endless conveyor constituting a part of the convoluting means and a part of the compacting means and continuously tending to move the rolls through the convoluting and compacting zones.

19. The method of forming rigid and substantially solid rod-like confection sticks, the method including the rolling-up of strips of thin sheet material such as paper, the rolling-up process producing loosely convoluted tubular rolls, and subsequently subjecting the rolls to pressure and a further rolling-up action in a compacting zone

until substantially solid rod-like confection sticks are produced, said further rolling-up or compacting action being continued until the convolutions are thoroughly bonded and the sticks have taken a permanent set, the method also including the application of a bond inducing agent to said sheet material.

20. The method of forming rigid and substantially solid rod-like confection sticks, the method including the rolling up of multiple layer strips of thin sheet material including an exterior layer of substantially transparent material, the rolling up process producing loosely convoluted tubular rolls with the transparent layer on the outside of the roll, and subsequently subjecting the rolls to pressure and a further rolling up action in a compacting zone until substantially solid rod-like confection sticks are produced, said further rolling-up or compacting action being continued until the convolutions are thoroughly bonded and

the sticks have taken a permanent set, the method also including the application of a bond inducing agent to said sheet material.

21. In apparatus for forming substantially solid confection supporting sticks of rolled up strip material such as paper, a convoluter acting upon strips of such material to form them into loosely convoluted tubular rolls, and a convoluting compacter receiving the rolls from the convoluter and subjecting them to pressure and a further rolling up action until their convolutions are thoroughly bonded and the resulting substantially solid rod-like elements have taken a permanent set, the compacter including a driven member having a portion of its moving surface acting as a part of the convoluter, said driven member also contacting and advancing the rolls through the convoluting and compacting zones.

SOL DECKER. 20