

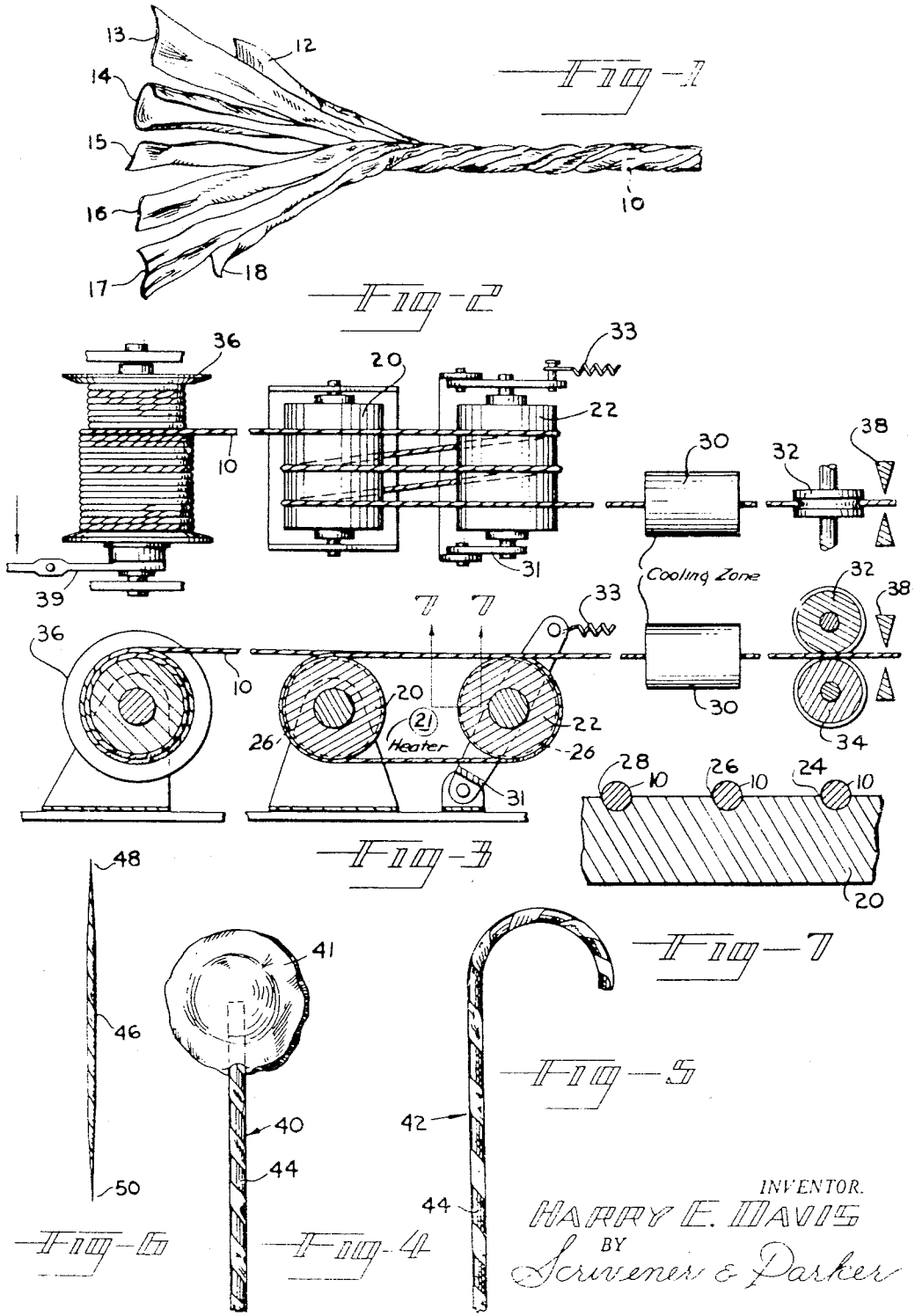
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CELLOPHANE STICK AND METHOD OF MAKING IT

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CELLOPHANE STICK AND METHOD OF MAKING IT

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1

This invention relates to the production of a substantially rigid rod-like article of manufacture adapted to a wide variety of uses, and more particularly to a method of constructing such article from a plurality of narrow ribbons of non-fibrous regenerated cellulosic material known as cellophane.

One of the objects of the present invention is to provide a novel relatively stiff and rigid rod-like material which may be readily cut into convenient lengths and advantageously utilized as handles for confections, such as lollipop, for example.

Another object is to provide a material of the foregoing character which is composed of a plurality of narrow cellophane ribbons which are tightly twisted together and so treated as to form an article wherein all of the ribbons are interlocking and adhesively secured together, thus securing an article having highly desirable moistureproof qualities, being substantially stiff and rigid throughout its length, and having a highly compacted substantially homogeneous cross section.

Another object relates to a novel method for producing rod-like material of the foregoing character and comprehends the utilization of waste cuts from the ends of rolls of cellophane sheeting, such cuts being in the form of rolls having widths varying from one-eighth inch up to one to two inches for example.

A further object is to provide a new and novel method for producing material of the above mentioned type which includes the initial formation of a twisted flexible strand from a plurality of cellophane ribbons coated with a non-toxic heat-activable adhesive, followed by the application of heat while the strand is under tension in order that the twisted ribbons may be thoroughly and effectively compacted and adhered to each other and thus provide a substantially rigid rod-like product.

A still further object comprehends the provision of an article of manufacture of the above type which is not only moisture proof but of sufficient permanency of form, compactness and rigidity as to be well adapted for use as confection handles, beverage stirring rods, as well as for a variety of other uses.

A still further object is to provide a novel article of manufacture of the above type which may be manufactured for a relatively low cost.

Other objects and novel features of the invention will appear more fully hereinafter from a consideration of following detailed description

2

when taken in connection with the accompanying drawing. It is to be expressly understood, however, that the drawing is employed for purposes of illustration only and is not to be taken as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing, wherein similar reference characters refer to similar parts throughout the several views;

Fig. 1 is a plan view illustrating the initial step in practicing the present invention, wherein a flexible strand is formed by tightly twisting and interlocking a plurality of cellophane ribbons of varying widths;

Fig. 2 is a plan view of an apparatus which may be employed for completing the formation of the material of the invention;

Fig. 3 is a side view of the apparatus of Fig. 2;

Fig. 4 is a front view of a confection embodying the material of the present invention as a handle;

Fig. 5 illustrates a simulated candy cane formed of the novel material;

Fig. 6 illustrates in enlarged form, a tooth-pick formed of the material, and

Fig. 7 is a fragmentary sectional view of the rollers of Figs. 2 and 3.

Referring more particularly to Fig. 1, the initial step of the present invention is illustrated therein as comprising the formation of a tightly twisted strand 10 from a plurality of relatively thin strips 12, 13, 14, 15, 16, 17 and 18 of non-fibrous regenerated cellulose known commercially as cellophane. In the present practice of manufacture of cellophane, it is customary to form the material into extremely thin sheets which are thereafter made up into rolls. In squaring the ends of such rolls, it has been necessary to cut relatively narrow reels from said ends, and heretofore, these reels or rolls of cellophane ribbons have been considered as waste cuts. By the present invention, it is proposed to employ a plurality of these ribbons, which may be obtained in varying widths, to form the flexible strand 10 of Fig. 1.

As shown in Fig. 1, the ribbons 12—18 are tightly twisted together to form the strand 10, it being understood that the twisting operation is performed by any suitable conventional mechanism. During the twisting operation, the ribbons are crinkled and become interlocked in a manner and for a purpose which will appear more fully hereinafter. It will also be understood that the ribbons from which the strand 10 is formed are

coated with a non-toxic heat-sealable adhesive which has been allowed to dry so as not to be tacky under ordinary atmospheric conditions. Sheet cellophane which has been coated with an adhesive capable of being heat sealed and possessing the other characteristics stated, is well known, and further description thereof is believed unnecessary.

In order to obtain the substantially rigid material of the present invention, the flexible twisted strand 10, formed in the manner above described is thereafter subjected to the action of heat, tension and pressure. Preferably, these actions are secured by passing the strand around a pair of grooved, heated rollers while the material is maintained under tension. More particularly and as shown in Figs. 2 and 3, the flexible strand 10 may be fed to a heated roller 20 and from the latter to a second heated roller 22. Rollers 20 and 22 may be heated in any suitable manner, such as for example by the use of a radiant heater 21 which has been diagrammatically illustrated. As shown, see also Fig. 7, the rollers 20 and 22 are provided with a plurality of circumferential grooves 24, 26 and 28, each having a semi-circular cross section and preferably the flexible strand 10 is wound around the rollers and within the grooves, as clearly illustrated in Figs. 2 and 3. Upon finally leaving the roller 22, the material is led through a cooling zone 30, which may take the form of a water spray or bath for example, and is finally conducted between a pair of grooved feed rolls 32 and 34 which serve to maintain the material under tension during its treatment. Additional tension in the material may be obtained by mounting one of the rollers 22 in such manner as to be movable with respect to the other roller 20. For example, the roller 22 may be supported in a movable frame 31 resiliently urged, as by an adjustable spring 33, in a direction to tension the material wound upon the rollers.

As shown, the twisted strand 10 may be wound upon a supply spool 35 which latter is arranged in cooperative relationship with the roll 20 in the manner illustrated. It is pointed out that suitable frictional or other mechanism may be associated with the supply of the strand material so that the latter will be maintained in the grooves of the rollers 20 and 22 in a taut condition and constantly under the tension exerted by the feed rolls 32 and 34 and the adjustable frame 31. For example, a pivoted frictional brake 39 may be associated with the supply spool 35 for frictionally resisting the feeding of the strand under the action of the feed rolls 32 and 34. As shown, a suitable shearing device 38 is provided for cutting the material in proper lengths for subsequent use.

In the practice of the method, it will be understood that the number of cellophane ribbons of varying widths which may be twisted together to form the flexible strand 10 will be determined by the area of the cross sectional shape desired in the finished product. Hence, while seven ribbons have been shown in Fig. 1, it will be readily understood that this is illustrative only. In actual practice, about twenty ribbons were used to produce a rod-like material of circular cross sectional area having a diameter of about one-eighth inch. Material of this size is well suited for beverage stirring rods and as handles for confections such as lollipops, see the handle 40 for confection 41 in Fig. 4.

After the assembly of the flexible strand 10

upon the rollers 20, 22, 32 and 34, in the manner shown in Figs. 2 and 3, the rollers 20 and 22 are heated to a temperature sufficient to soften or activate the heat sealable adhesive with which the cellophane ribbons 12-18 are coated. Thereafter, the feed rollers 32 and 34 are placed in operation whereupon the strand 10 will be heated while positioned in the semi-circular grooves 24, 26 and 28 of the rollers 20 and 22 and drawn from the supply and over the said rollers under tension. It will be understood that the degree of tension may be readily varied at any time by adjusting the friction brake 39.

During the travel of the flexible material 10 within the grooves 24, 26 and 28 and over the heated rollers under tension, as above described, the adhesive coatings on the cellophane ribbons will be heated to such a temperature that they become softened or activated in order to seal all the ribbons together and to compact them to achieve a substantially homogeneous, dense and solid cross section. After leaving the roller 22, the material is passed through the cooling zone 30 where the adhesive is cooled and set to form the substantially rigid and rod-like product. After being fed through the feed rolls 32 and 34, the knife 38 is effective to cut the product into desired lengths. The compactness and denseness of the product is materially facilitated by the crinkling of the ribbons during the initial twisting thereof. In this manner, the ribbons become interlocked with each other so that all danger of the peeling off of ribbons from the final product is avoided.

The material formed in accordance with the present invention is adapted to a wide variety of uses, and while several applications have been shown herein, it will be readily understood that these are illustrative only, and that the material may be employed for other uses. In Fig. 4, the member 40 is utilized as a handle for a confection, while in Fig. 5, the material, after its formation as above described, is molded by the application of heat and pressure into the form of a candy cane 42. In both instances, a colored cellophane ribbon 44 may be twisted with the other ribbons in the initial step in order to enhance the appearance of the product. For example, in the case of Fig. 5, the colored ribbon may be red so that the resultant product not only suggests a candy cane in shape but also in appearance.

It has also been found that the material of the present invention is well adapted for use as a tooth pick, one of which has been shown at 46 in Fig. 6. Because of the homogeneous, compact and solid cross section of the product, the same may be sharpened as with a knife or other cutting implement, and in Fig. 6 the toothpick has been illustrated with sharpened ends 48 and 50.

In the foregoing description, it was pointed out that in using the semi-circular grooves 24, 26 and 28, with the grooved pressure rollers, the resultant product had a circular cross section. It will therefore be readily understood that by changing the cross sectional shape of the grooves 24, 26 and 28, and correspondingly changing the shape of the grooves in the pressure rollers, any desired cross sectional shape may be imparted to the finished product. Another method of obtaining a desired cross sectional shape includes the provision of a suitably formed die positioned between the roller 22 and the cooling zone 30 and through which the material is passed prior to the cooling thereof.

While it is preferred that all of the cellophane ribbons be adhesively coated, it will be understood that some of the ribbons may be uncoated if desired. In this manner, during practice of the process, a lesser amount of adhesive is present to bond the ribbons together and hence the resultant product would possess greater flexibility. Thus the degree of flexibility of the finished product may be readily controlled in a simple but efficient manner.

A further method of controlling the degree of flexibility of the product is achieved by varying the amount of twist of the adhesively coated strips in initially forming the strand 10. Thus it has been found that when the strips are twisted to a lesser degree, the resultant product after the application of heat and pressure is relatively rigid. On the other hand, if the strand is twisted to a greater degree, that is given more turns per inch, the resultant product is quite flexible and is therefore especially adapted for use as a safety handle for a confection.

While the invention has been shown and described herein with considerable particularity, it will be readily understood by those skilled in the art that a wide variety of modifications may be resorted to without departing from the spirit of the invention. Reference will therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A method of making a rod-like article of manufacture which comprises twisting a plurality of ribbons of non-fibrous regenerated cellulose to form a flexible strand, each of said ribbons being coated with a heat-activable adhesive, thereafter placing the flexible strand in longitudinal tension, thereafter subjecting the tensioned strand to the action of heat in order to activate the adhesive and cause adherence between said ribbons and to compact the strand, and finally cooling the strand to set the adhesive while maintaining the strand in longitudinal tension.

2. A method as set forth in claim 1 wherein the flexible strand is continuously moved under tension during the application of heat to the strand and the subsequent cooling thereof.

3. A method of making a substantially rigid rod-like article of manufacture from a plurality of ribbons of varying width, each of said ribbons being formed of regenerated cellulosic material and being coated with a heat-activable adhesive, which comprises twisting said ribbons together to form a flexible strand, thereafter passing said strand around a heated roller to activate the adhesive to cause the twisted ribbons to adhere to each other, then cooling the resultant material, and continuously feeding said strand under tension as the strand is heated and then cooled.

4. A method of making a rod-like article of manufacture from a plurality of narrow ribbons, each of said ribbons being formed of regenerated cellulosic material and being coated with a heat-activable adhesive, which comprises twisting said ribbons together to crinkle each ribbon and interlock all of the said ribbons together to form a flexible strand, thereafter continuously moving the strand under tension from one point to another point, and first subjecting the moving tensioned strand between said points to the action of heat to activate the adhesive, cause adherence between all of said interlocked ribbons and to compact the strand, and then subjecting the moving, tensioned and heated strand between said

points to the action of a cooling medium to set the adhesive and stiffen the strand.

5. The method as set forth in claim 4 wherein the degree of flexibility of the article is varied by varying the degree of twist of the ribbons.

6. A method of making a rod-like article of manufacture from a plurality of ribbons, each of said ribbons being formed of regenerated cellulosic material and being coated with an adhesive which is dry and non-tacky under ordinary atmospheric conditions, which comprises, twisting said ribbons together to crinkle each ribbon and interlock all of said crinkled ribbons together to form a flexible strand, continuously moving the strand under longitudinal tension from one point to another point, softening the adhesive coatings while said strand is moved under tension between said points to cause adherence between all of said interlocked ribbons and to compact the strand, and thereafter setting the adhesive while the strand is under tension to stiffen the strand.

7. A method of making a rod-like article of manufacture from a plurality of ribbons, each of said ribbons being formed of regenerated cellulosic material and being coated with an adhesive which is dry and non-tacky under ordinary atmospheric conditions, which comprises, twisting said ribbons together to crinkle each ribbon and interlock all of said crinkled ribbons together to form a flexible strand, then winding said strand on a supply roll, then feeding the strand from the supply roll around a heated roller provided with grooves for receiving the strand to activate the adhesive and cause the twisted ribbons to adhere to each other, then passing the strand through a cooling zone to set the adhesive and stiffen the strand to form a relatively rigid, rod-like material, continuously drawing the strand from said heated roller through the cooling zone while restraining the movement of the supply roll and hence the feeding of the strand to the heated roller to tension the strand longitudinally as it is subjected to the action of the heated roller and then to the action of the cooling zone, and finally cutting the relatively rigid, rod-like material into convenient lengths.

8. An article of manufacture, comprising a plurality of tightly twisted dry ribbons of regenerated cellulosic material, the ribbons being crinkled to interlock them together, and being adhesively secured to each other and together to form a substantially rigid rod-like material having a substantially dense and solid cross section.

9. An article of manufacture, comprising a plurality of twisted and crinkled adhesively coated ribbons of regenerated cellulosic material, the ribbons being sealed together under tension and compacted into a relatively rigid, rod-like form having a substantially dense and solid cross section.

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