April 10, 1956 J. K. FRANCIS 2,741,149

METHOD AND APPARATUS FOR MANUFACTURING CORD

Filed Oct. 29, 1951

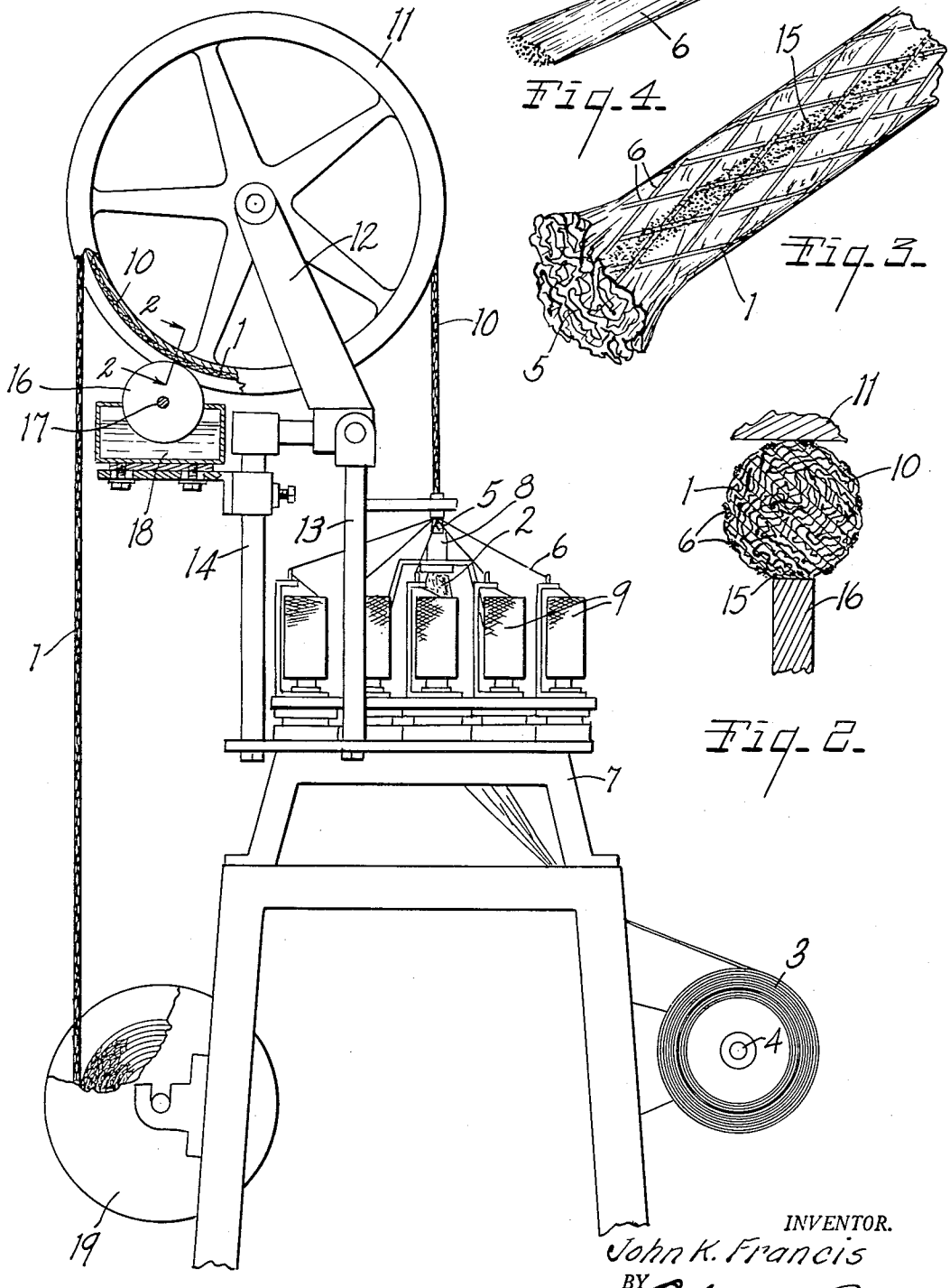


Fig. 1.

Fig. 4.

Fig. 3.

Fig. 2.

INVENTOR.
John K. Francis
BY
Otis A. Earl
Attorney.

United States Patent Office 2,741,149 Patented Apr. 10, 1956

2,741,149

METHOD AND APPARATUS FOR MANUFACTURING CORD

John K. Francis, Grand Rapids, Mich., assignor to Sackner Products, Inc., Grand Rapids, Mich.

Application October 29, 1951, Serial No. 253,624

6 Claims. (Cl. 87—1)

This invention relates to improvements in method and apparatus for manufacturing cord.

The main objects of this invention are:

First, to provide a method of making packing cord, beading cord, edge rolls and the like which enables the very rapid and economical production of a satisfactory product of this character and consisting of a cellulose fibre body, a wrapping consisting of strands braided into open mesh on the body, and a strip of adhesive extending longitudinally of the body in overlying crossing relation to the strands.

Second, to provide an apparatus for practicing the aforesaid method which is comparatively simple and capable of high production and results in a very uniform product.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary elevational view of an apparatus embodying my invention adapted for the practicing of the method, the apparatus being shown partially in section and certain parts being shown conventionally.

Fig. 2 is an enlarged fragmentary view on a line corresponding to line 2—2 of Fig. 1.

Fig. 3 is a fragmentary perspective view of the product of my method and apparatus.

Fig. 4 is an enlarged fragmentary perspective view of one of the wrapping strands.

The method and apparatus of this invention are adapted for the production of packing cord, beading cord, edge rolls and the like, the subject matter of my copending application for Letters Patent Serial Number 251,615, filed October 16, 1951, and now Patent No. 2,722,861, which issued November 8, 1955. In the accompanying drawing I have illustrated an apparatus suitable for the commercial practice of my method, certain parts being shown conventionally as the details thereof form no part of this invention.

In the accompanying drawing, 1 (Fig. 3) represents the completed product, 2 represents a strip of cellulose fibre stock desirably creped cellulose tissue, and 3 a roll thereof mounted upon the spindle 4. The structure 1 comprises a body 5 formed by crumpling and compressing the strip 2 into an elongated body of substantially uniform section and of substantial resilience, and wrapping strands 6 which are braided upon the formed body into an open mesh as shown in Fig. 3 with the strands extending spirally around the body. The strands 6 are in the preferred embodiment of glass fibres impregnated and coated with wax, desirably a microcrystalline wax, and they are of generally flattened cross section as shown in Fig. 4. As stated, this structure is the subject matter of my copending application.

The braiding machine designated generally by the numeral 7 crumples and conforms the strip 2 into the body 5 of substantially uniform section and substantial

resilience. This results, in the machine illustrated, from drawing the material 2 through an eye 8. The wrapping strands 6 are conventionally shown in Fig. 1 and are drawn from spools or bobbins 9 which are desirably driven to braid the strands upon the body as is shown in Fig. 3 and as is conventionally illustrated in Fig. 1. As braiding machines of this type are known in the art I do not illustrate or describe the same in further detail herein.

The braided body designated 10 in Fig. 1 is rove or passed around the pulley 11, preferably in at least one complete wrap. This pulley is supported by a bracket 12 carried by the posts 13 and 14 on the braiding machine. The finished product has a strip of flexible adhesive extending longitudinally of the body and across the strands thereon and contacting the body at each side of the strands. This adhesive in the machine illustrated for the practicing of my method is applied by means of an adhesive applying roller 16 journaled at 17 and dipping into the adhesive fountain 18. The roller is disposed in opposed relation to the pulley and engages the wrapped body 10 with such pressure as to result in the driving of the roller and to insure the deposit of a substantially uniform strip of adhesive. The adhesive is of a flexible nontacky type and desirably quick drying so that the cord or roll may be directly wound upon the spool or reel 19 which is desirably driven, the driving means not being illustrated.

The strands are desirably tensioned as to substantially embed them in the surface body as is shown in Fig. 2. The flat sectioned strands facilitate this and result in a product which is substantially smooth.

The spools or reels 19 are desirably those on which the product is merchandised. The longitudinally extended adhesive strip prevents substantial and objectionable unraveling of the wrapping strands when the material is cut into sections for use. I am aware that adhesive has been applied to cotton thread or yarn wrapping strands before they are braided as disclosed in the Sackner Patent 2,250,776, July 29, 1941. This, however, is relatively expensive as compared to the applicant's product and method and requires frequent cleaning of the machine and of the surroundings of the machine.

The glass fibre strands impregnated with wax are desirable as they are strong as compared to cotton thread or yarn. The impregnating of the glass fibres with wax, preferably microcrystalline wax, is an important factor in the strength of such strands. It is not practical to apply adhesive to such strands as has been done with cotton thread or yarn strands because the adhesive does not effectively adhere thereto. However, by applying the strip of adhesive over the strands they are connected to the body.

I have illustrated and described one practical apparatus for the practicing of my method. I have not attempted to illustrate and describe other apparatus which I contemplate might be used as I believe this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of making packing cord, beading cord, edge rolls and the like, comprising the steps of longitudinally translating elongated strips of cellulose and crumpling and forming the strips so translated into a body of substantially uniform section and of substantial resilience, longitudinally translating the formed body at the speed at which the same is formed and under longitudinal tension and while the formed body is being so translated braiding a plurality of strands into an open mesh thereon and substantially embedding the strands in the body, each strand being composed of a plurality of

glass fibers and being impregnated with a flexible binding material, and after the braiding of the strands upon the body and while it is being so translated applying a relatively narrow substantially straight strip of flexible adhesive to the surface of and extending longitudinally of the body and across the strands braided thereon and contacting the body at each side of the strands, thereby securing the body encircling wraps of the strands to the body and maintaining their spaced relation thereon.

2. The method of making packing cord, beading cord, edge rolls and the like comprising the steps of longitudinally translating elongated strips of cellulose and crumpling and forming the strips so translated into a body of substantially uniform section and of substantial resilience, longitudinally translating the formed body at the speed at which the same is formed and under longitudinal tension and while the formed body is being so translated braiding a plurality of strands into an open mesh thereon, and after the braiding of the strands upon the body and while it is being so translated applying a relatively narrow substantially straight strip of flexible adhesive to the surface of and extending longitudinally of the body and across the strands braided thereon and contacting the body at each side of the strands, thereby securing the body encircling wraps of the strands to the body and maintaining their spaced relation thereon.

3. The method of making packing cord, beading cord, edge rolls and the like comprising the steps of crumpling and compressing longitudinally translated strips to form an elongated longitudinally translated body of substantially uniform section and of substantial resilience, and while the elongated body is being translated braiding strands into an open mesh wrapping thereon, the strands extending spirally thereof and embedded in the surface of the body, and successively with the braiding of the strands and while the strand wrapped body is being translated after the braiding applying a relatively narrow substantially straight strip of flexible adhesive to the surface of and extending longitudinally of the body and across the wrapping strands and contacting the body at each side of the strands, whereby the several body encircling wraps of the strands are connected to the body by the adhesive strip.

4. The method of making packing cord, beading cord, edge rolls and the like comprising the steps of forming an elongated body of compacted resilient material and of

substantially uniform section and translating the same under longitudinal tension as it is formed, and while so translating it braiding a plurality of strands into an open mesh thereon with each strand extending spirally around the body, and thereafter and while the braided body is being so translated applying a relatively narrow substantially straight strip of non-tacky and flexible adhesive to the surface of and extending longitudinally of the body and across the wrapping strands in contacting relation with the body at the sides of the strands and connecting each spiral wrap of the strands to the body.

5. An apparatus for applying adhesive strips to a cord having a resilient elongated body of fibrous material and having a plurality of strands braided spirally thereon, said strands providing an open mesh wrap upon the body, said apparatus comprising a pulley around which the braided body is passed in at least one complete wrap, the pulley having a circumferential groove receiving said wrapped body, an adhesive applying roller disposed in opposed relation to the pulley for contacting driving engagement with the wrapped body on the pulley, and an adhesive supply fountain for the roller whereby a continuous longitudinal strip of adhesive is applied to the wrapped body crossing the wrapping strands thereon and contacting the body at each side of the strands.

6. An apparatus for applying adhesive strips to a packing cord having a resilient elongated body of fibrous material and having a plurality of strands braided spirally thereon, said strands providing an open mesh wrap upon the body, said apparatus comprising a pulley around which the braided body is passed in at least one complete wrap, and an adhesive applying means disposed in opposed relation to the pulley for contacting engagement with the wrapped body on the pulley.

References Cited in the file of this patent

UNITED STATES PATENTS

1,321,421	Delany	Nov. 11, 1919
1,638,254	Freydberg et al.	Aug. 9, 1927
2,107,467	Buhler	Feb. 8, 1938
2,250,776	Sackner	July 29, 1941
2,319,019	Van Court	May 11, 1943
2,442,335	Bauer	June 1, 1948
2,478,940	Pape	Aug. 16, 1949
2,557,343	Cook	June 19, 1951
2,592,632	Williamson	Apr. 15, 1952