

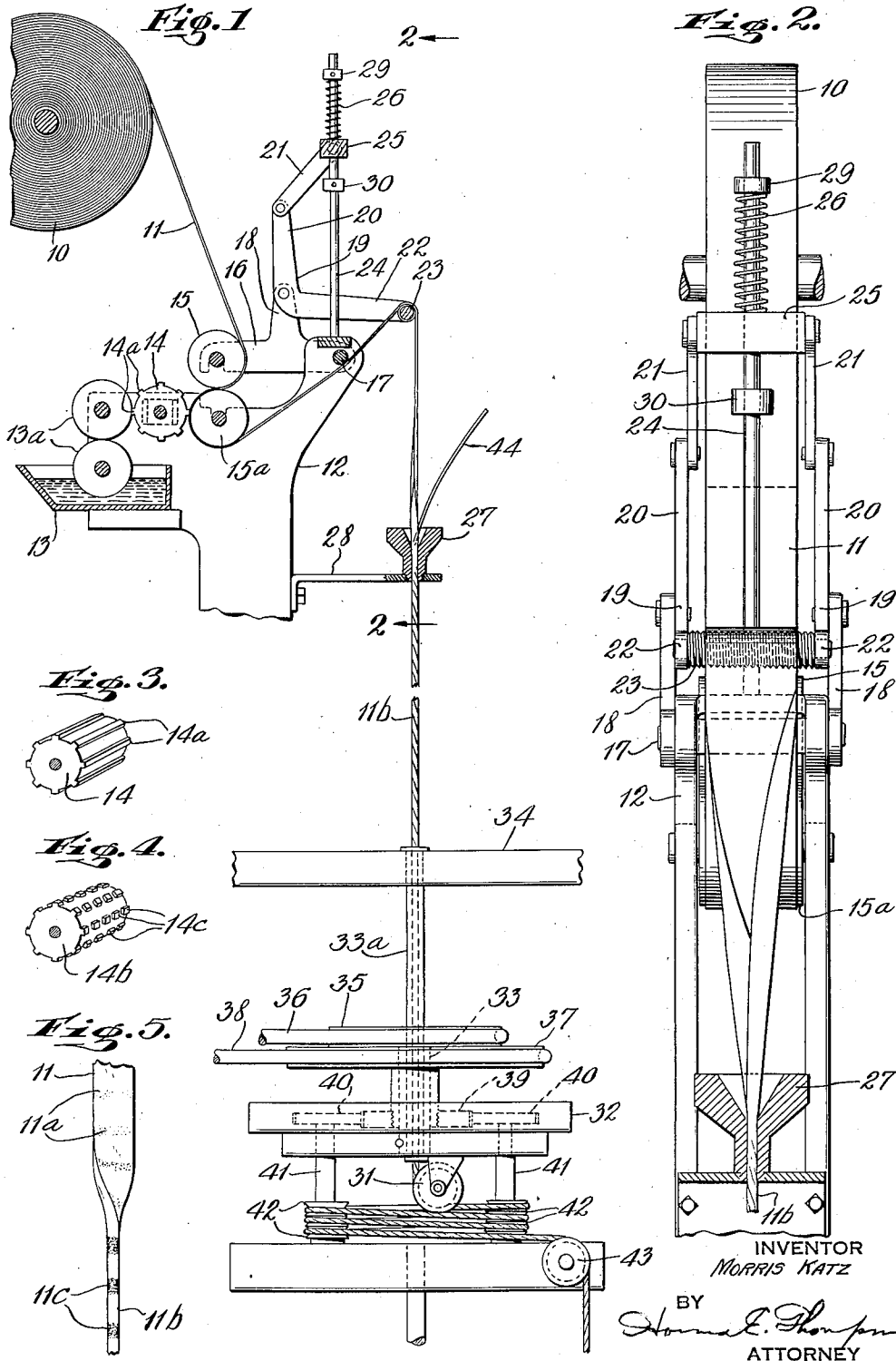
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CELLULOSIC CORD AND METHOD OF MAKING THE SAME

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## CELLULOSIC CORD AND METHOD OF MAKING THE SAME

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13 Claims. (Cl. 117—3)

This invention relates to the manufacture of cord or twine composed of cellulosic material; and the object of the invention is to provide an improved and simplified method of producing strands of the type under consideration, which consists in employing a narrow strip or band of "Cellophane" or similar cellulosic material arranged upon a spool or roll, and then twisting the same to form a cord or twine; a further object being to provide means for printing the flat strip at longitudinally spaced intervals prior to the twisting operation thereof, so as to form on the twisted cord or strand, spaced markings such as stripes or the like of a color contrasting to the base color of the strip employed and still further to the arrangement of two or more different colors alternately or in predetermined spaced relationship or grouping on the strip to produce in the resulting cord or strand a multicolor effect; a further object being to provide a relatively light or faint marking or print on the strip when in its flat state, and wherein the resulting twisted cord will form a relatively dense or solid color by disposing several layers of the faint marking or print one upon the other, and with these and other objects in view, the invention consists in a cord or strand produced in accordance with the method and by the apparatus more fully hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a diagrammatic view indicating parts of an apparatus employed for carrying my invention into effect, parts of the construction being broken away and in section;

Fig. 2 is a sectional view, approximately on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of one form of printing roller which I employ;

Fig. 4 is a view similar to Fig. 3 showing another form of roller which I may employ; and,

Fig. 5 is a detailed view illustrating the marking or printing of the strip in the result obtained after twisting said strip to form the cord.

In Fig. 1 of the drawing I have diagrammatically illustrated an apparatus for forming twisted cord of the type and kind desired and in said figure, 10 represents a spool or roll of strip cellulose material 11, such for example as "Cellophane". The strip 11 extends from the roll and first passes through a printing mechanism 12 having an ink fountain or well 13, ink transmitting rollers 13a, a printing roller 14 and strip guiding rollers 15, 15a. The roller 14 in the construction shown in Figs. 1 and 3 is a series of circumferentially spaced and longitudinally ar-

ranged printing bars or ribs 14a, which are adapted to form on one surface of the strip 11 longitudinally spaced marks or prints 11a, as clearly illustrated in Fig. 5 of the drawing. The prints or markings at 11a are relatively faint but in the twisting or folding of the strip 11 to form the cord or twine 11b, the piling or multiple layers of the markings 11 form deep shaded markings or bars 11c, longitudinally of the cord 11b. The same, or substantially the same effect can be produced by providing a printing roller 14b having rows of small printing surfaces 14c spaced circumferentially of the roller 14b as indicated in Fig. 4, so as to provide a plurality of transversely spaced marks or prints on the strip instead of the bars or lines 11a as will be apparent.

At this time it will also be understood that a printing unit 12 may include another series of inking rollers and another ink-well cooperating with an additional printing roller similar to the relation 14—14b for the application of another print or mark on the strip 11 of a color contrasting to the first named marking and arranged intermediate the first named markings on said strip, or in fact any desired arrangement of the prints or markings may be provided to produce different effects in the resulting cord or in other words, three or more contrasting colors may be provided in any desired arrangement. That is to say, the color of the strip itself, plus the additional colors applied thereto. The second printing step or operation, or the means for accompanying the same is not shown as it would simply constitute a duplication of certain parts and will be readily understood from the disclosure of the single printing step diagrammatically illustrated in Fig. 1 of the drawing. In other words, the dual printing of the strip may be accomplished by first running the strip through the printing mechanism shown in Fig. 1 of the drawing with one color material in the well 13 and without passing the strip through the twisting part of the machine, after which the strip may be again passed through the printing mechanism with another color in the well 13 to print the second color on said strip instead of using duplicate printing mechanisms as above referred to.

The roller 15 is preferably mounted in one end of a lever 16 pivoted to the frame of the printing unit 12 as seen at 17. The lever having an upwardly directed part 18 intermediate the ends thereof. Pivoted to the extension 18, is a lever 19, one end 20 of which extends upwardly and pivoted to said end is a link 21 and the other end 22 of the lever 19 has a cross-member 23 around which the strip 11 passes, said strip also passing over the pivot pin or rod 17 which acts as a guide between the roller 15a and the member 23. Secured to and projecting above the frame of the unit 12 is a rod 24 on which is slidably

mounted a block 25 to which the free end of the link 21 is pivoted. The block 25 operates upon a coil spring 26 on the rod 24 in its upward movement of the member 23. This construction gives the required tension to the strip 11 prior to its passage into and through the conical forming tool 27 for starting the curling and twisting operation to be performed on the strip in forming the twisted cord or twine 11b. The tool 27 is supported upon a bracket 28 attached to the frame of the unit 12.

In describing the parts 16, 19 and 21, as single elements, it will appear from a consideration of Fig. 2 of the drawing, that these elements are arranged in pairs at opposite ends of the roller 15 and the rod 24. It will also appear from a consideration of Fig. 2 of the drawing that the member 23 is in the form of a screw so as to reduce the surface area engaged by the strip 11 to avoid any tendency to smear or rub the print thereon should the latter fail to dry before reaching the member 23. It will be understood, however, that a quick drying ink or fluid is used, and if additional time is necessary, the strip 11 may be passed through a stage of drying rollers after passing from the roller 15a, and before passing over the member 23 for entrance into the tool 27.

At the upper end portion of the rod 24 is an adjustable collar 29 forming a stop for the spring 26, and by means of which the tension of the spring may be adjusted. On the rod 24 below the block 25, is another adjustable collar 30 forming a stop limiting downward movement of the block when the device is not in use.

The cord 11b is twisted between the tool 27 and a pulley 31 supported in connection with a revolving frame or head 32. The head 32 has a sleeve 33 rotatably mounted on a tubular shaft 33a which extends downwardly from a support 34, and the cord 11b passes through the tubular shaft 33a. The shaft 33a is driven by means of a pulley 35, the belt 36 of which is coupled with a suitable driving means which is not shown. Rotatably mounted on the sleeve 33 is another larger pulley 37 driven through a belt 38 by other means which is not shown. Coupled with the pulley 37 is a gear 39 which meshes with pinions 40, the shafts 41 of which are also provided with a series of pulleys 42 which serve to feed or draw the cord 11c through the machine. The cord passes around the respective or opposed pulleys in the manner indicated in Fig. 1 of the drawing and then extends downwardly from another pulley 43, and thereafter the cord may be wound upon a suitable receiving spool in any desired manner.

By arranging the tool 27 in perpendicular alignment with the roller 31 of the frame 32, the desired twisting and operation will be performed between these points and in a relatively straight line so as to produce a more or less uniformly twisted product. It will appear, especially from a consideration of Fig. 2 of the drawing that the tool 27 serves to turn or curl the side edges of the strip 11 inwardly prior to the twisting operation. It will thus appear that no sharp edges will prevail on the resulting cord, and the same will have considerable strength when subjected to longitudinal stress or pull.

In some instances a filler cord or strand 44, indicated in Fig. 1 of the drawing, may be laid in the inturned edges or folds of the strip prior to twisting the same to form a filler cord or core for the resulting cord or strand. This insert may be made of any suitable soft material and may be treated with a saturant to maintain the resulting

twisted "Cellophane" cord in soft and pliable state in accordance with the teachings in my prior Patent No. 2,041,418, granted May 19, 1936.

In using a strip 11 of clear or transparent "Cellophane", the cord 44 will also be composed of a light or white color so as not to interfere with or destroy the color values of the printed stripes or sections appearing on the resulting "Cellophane" cord.

It will be understood that my invention is not necessarily limited to the form of printing mechanism herein diagrammatically illustrated, nor to any specific arrangement of the parts, as the illustration in the accompanying drawing is purely diagrammatic with respect to the association of the several parts, and the spacing and arrangement thereof, the only important feature being in the alinement of the tool 27 with the pulley 31. It will also be understood that different types of printed matter or markings may be arranged upon the strip prior to the twisting thereof to produce different designs and effects in the resulting twisting cord.

In the operation of the method as herein specifically described, it will be apparent that the advantage in applying a light tint or print to the strip is to avoid the necessity of drying a heavy body of the printing ink, dye or other material employed, while at the same time this light tinting produces a deep or dense color in the stripings or markings 11c, which will have a distinct lustre producing a very attractive appearance throughout the entire cord or twine which is produced. It will, of course, be apparent that in producing different runs of the material, different colors of inks or dyes may be used in the production of clearer contrasting color effects in the resulting products produced.

I claim:

1. The herein described method of forming characterized cellulosic cords or strands which consists in providing a relatively narrow strip of cellulosic material, passing said strip through means for applying characterized markings on the strip at longitudinally spaced intervals and then folding said strip to the desired form of said strand with said markings arranged in longitudinal spaced relation on the strand.

2. The herein described method of forming characterized cellulosic cords or strands which consists in providing a relatively narrow strip of cellulosic material, passing said strip through means for applying characterized markings on the strip at longitudinally spaced intervals and then twisting said strip to the desired form of said strand with said markings arranged in longitudinal spaced relation on the strand, the markings applied to said strip being of a color contrasting to that of the base color of said strip and being arranged transversely of the strip in the form of light tints, and the twisting of said strip into the strand disposing the transverse portions of said markings in superimposed relation to form in the resulting strand relatively dark or deep colors in said markings.

3. The herein described method of forming characterized cellulosic cords or strands which consists in providing a relatively narrow strip of cellulosic material, passing said strip through means for applying characterized markings on the strip at longitudinally spaced intervals and then twisting said strip to the desired form of said strand with said markings arranged in longitudinal spaced relation on the strand, the markings applied to said strip being of a color con-

trasting to that of the base color of said strip and being arranged transversely of the strip in the form of light tints, the twisting of said strip into the strand to superimpose the transverse portions of said markings to form in the resulting strand relatively dark or deep colors in said markings, and laying a core strip or cord within the folds of said strip to provide a reinforcement for the resultant strand.

4. The herein described method of forming characterized cellulosic cords or strands which consists in providing a relatively narrow strip of cellulosic material, passing said strip through means for applying characterized markings on the strip at longitudinally spaced intervals and then twisting said strip to the desired form of said strand with said markings arranged in longitudinal spaced relation on the strand, the markings applied to said strip being of a color contrasting to that of the base color of said strip and being arranged transversely of the strip in the form of light tints, the twisting of said strip into the strand to superimpose the transverse portions of said markings to form in the resulting strand relatively dark or deep colors in said markings, laying a core strip or cord within the folds of said strip to provide a reinforcement for the resultant strand, and treating the core strip or cord with the saturant to maintain the cellulosic material of said strand in soft and pliable state.

5. A cord or strand of the class described consisting of a twisted strip of cellulosic material, said strip having colored markings spaced longitudinally and arranged transversely thereof and at right angles to the longitudinal plane of said strip, and said markings being of a color contrasting to the color of said strip and forming on the resulting twisted strand longitudinally spaced circumferential colored bands.

6. A cord or strand of the class described consisting of a twisted strip of cellulosic material, said strip having colored markings spaced longitudinally and arranged transversely thereof, said markings being of a color contrasting to the color of said strip and forming on the resulting twisted strand longitudinally spaced circumferential colored bands, and the markings on said strip being light so as to form on the resulting twisted strand markings of deep color value by superimposing the transverse portions of the markings in twisting said strand.

7. A cord or strand of the class described consisting of a twisted strip of cellulosic material, said strip having colored markings spaced longitudinally and arranged transversely thereof, said markings being of a color contrasting to the color of said strip and forming on the resulting twisted strand longitudinally spaced circumferential colored bands, the markings on said strip being light so as to form on the resulting twisted strand markings of deep color value by superimposing the transverse portions of the markings in twisting said strand, and said strip including a filler strand.

8. A cord or strand of the class described consisting of a twisted strip of cellulosic material, said strip having colored markings spaced longitudinally and arranged transversely thereof, said markings being of a color contrasting to the color of said strip and forming on the resulting twisted strand longitudinally spaced circumferential colored

bands, the markings on said strip being light so as to form on the resulting twisted strand markings of deep color value by superimposing the transverse portions of the markings in twisting said strand, said strip including a filled strand, and said filled strand being treated with a saturant to maintain the cellulosic material soft and pliable.

9. A cord or strand of the class described consisting of a twisted strip of cellulosic material, said strip having colored markings spaced longitudinally and arranged transversely thereof and at right angles to the longitudinal plane of said strip, said markings being of a color contrasting to the color of said strip and forming on the resulting twisted strand longitudinally spaced circumferential colored bands, and the markings on said strip being of two distinct colors so as to provide in conjunction with the base color of said strip a series of different colors arranged longitudinally of said strand.

10. A cord or strand of the class described consisting of a twisted strip of cellulosic material, said strip having colored markings spaced longitudinally and arranged transversely thereof and at right angles to the longitudinal plane of said strip, said markings being of a color contrasting to the color of said strip and forming on the resulting twisted strand longitudinally spaced circumferential colored bands, the markings on said strip being of two distinct colors so as to provide in conjunction with the base color of said strip a series of different colors arranged longitudinally of said strand, a light colored filled cord arranged within and forming a core for said twisted strand, and said core including a saturant for maintaining the cellulosic material of said strand in soft and pliable state.

11. A strand of the class described comprising an elongated body of cellulosic material, said body having longitudinally spaced light transverse markings thereon of a color contrasting to the color of the material employed in forming said body, and said body being folded transversely to superimpose the light markings to provide deep color value to the markings on the resulting strand.

12. A strand of the class described comprising an elongated body of cellulosic material, said body having longitudinally spaced light transverse markings thereon of a color contrasting to the color of the material employed in forming said body, said body being folded transversely to superimpose the light markings to provide deep color value to the markings on the resulting strand, and alternate markings on said strand being in color contrasting to the color of the other markings thereon.

13. A strand of the class described comprising an elongated body of cellulosic material, said body having longitudinally spaced light transverse markings thereon of a color contrasting to the color of the material employed in forming said body, said body being folded transversely to superimpose the light markings to provide deep color value to the markings on the resulting strand, and means arranged longitudinally of and within said strand for reinforcing the same and for maintaining the cellulosic material of said strand in soft and pliable condition.

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