April 12, 1955 C. E. STEIGER ET AL 2,705,862

KNOTLESS SPLICED TWISTED PAPER CORD
AND METHOD OF FORMING THE SAME
Filed May 14, 1953

Fig. 1.

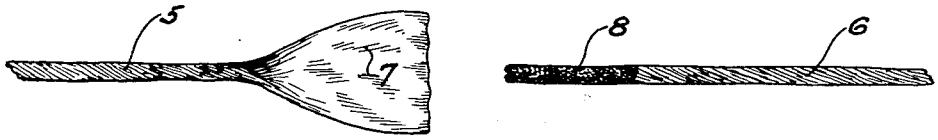


Fig. 2.

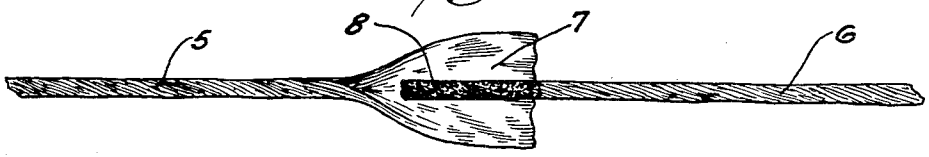


Fig. 3.

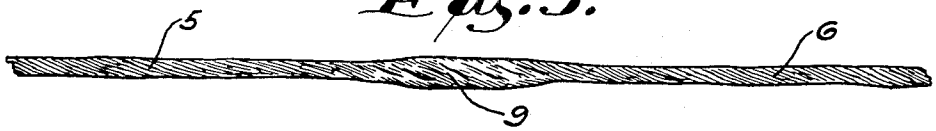
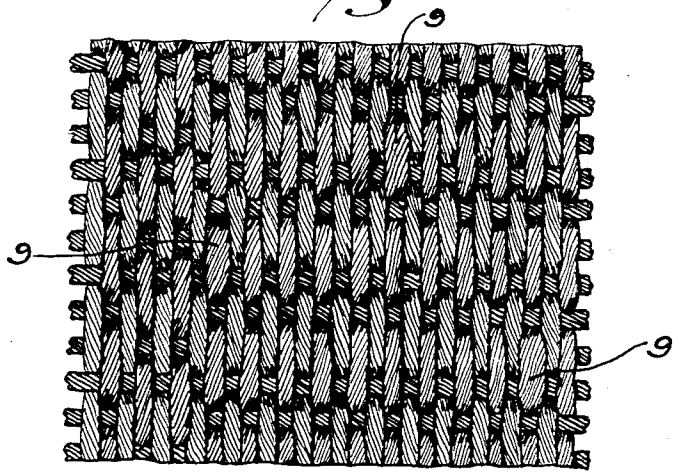


Fig. 4.



INVENTORS
Carl E. Steiger &
Clarence C. Dorschner,
BY
Morsell & Morsell
ATTORNEYS.

United States Patent Office 2,705,862 Patented Apr. 12, 1955

2,705,862

KNOTLESS SPLICED TWISTED PAPER CORD AND METHOD OF FORMING THE SAME

Carl E. Steiger and Clarence C. Dorschner, Oshkosh, Wis., assignors to Deltox Rug Company, Oshkosh, Wis., a corporation of Wisconsin

Application May 14, 1953, Serial No. 355,098

4 Claims. (Cl. 57—142)

This invention relates to improvements in knotless spliced twisted paper cord and method of forming the same.

In the manufacture of certain types of woven fabrics such as are used for rugs and floor coverings, it has been the practice to utilize as the strands for the warp or the woof, or both, fiber twine or cord which is composed of twisted paper. For feeding the unbroken extents of twisted paper cord or twine to the loom, packages of the cord are supplied which contain the contents of two or more spools, each spool containing about two thousand feet of the cord or twine. The twisted paper cord or twine as it comes from the twisting mechanism is initially wound onto spools and then the contents of two or more spools are combined to form a loom package. In practice, the contents of a spool include a number of lengths of the twisted paper cord with the adjacent ends of said lengths attached together. Also, the extents of cord on a pair of spools are customarily joined to form a package. According to previous conventional practices the lengths of twine making up a spool have had the adjacent ends tied together and the same is true of the yarn from several spools which compose a package. Consequently, as the cord or twine is withdrawn from a package during the loom weaving operations there would be knots in the joined sections of the cord or twine supplied to the loom which ultimately showed up in the woven rug fabric and caused imperfections therein which required time consuming hand operations to minimize their visual effects.

With the above in mind it is the primary object of the present invention to overcome the above objections inherent in the conventional knotted paper cord or twine supplied to a loom for rug weaving, by the provision of elongated extents of paper cord or twine which are devoid of knots or other flaws and imperfections which will show up in and impair the appearance of the final woven fabric.

A further object of the invention is to provide a knotless twisted paper cord or twine of any desired length wherein the sections thereof have their adjacent ends joined by means of imperceptible splices which do not cause any imperfections in the ultimate woven fabric, thus eliminating the standard requirement for "mending" or reducing the visual effect of the conventional knots appearing in the surface portions of fabrics woven from extended lengths of twisted paper cord or twine.

A further object of the invention is to provide a knotless spliced twisted paper cord or twine of any desired extended length wherein the ends of adjacent sections are permanently connected in a manner so that no knots or unsightly imperfections appear throughout the length thereof.

A further object of the invention is to provide a method of forming knotless spliced twisted paper cord or twine of relatively long lengths adapting the cord for use in woven fabrics and eliminating the necessity for hand operations to eliminate or minimize the visual effects of imperfections in the finished product.

A further object of the invention is to provide a method of forming knotless spliced twisted paper cord or twine which is very simple, which can be carried out expeditiously during the cord winding process and which produces a twisted paper cord or yarn of any desired length devoid of objectionable bulky connections.

A further object of the invention is to provide a knotless spliced twisted paper cord and method of forming

the same which is simple, inexpensive, commercially practical, and well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved knotless spliced twisted paper cord and method of forming the same and all of the parts, combinations and steps incident thereto as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a view of a pair of adjacent sections or extents of twisted paper cord or twine prepared for knotless splicing;

Fig. 2 is a view similar to Fig. 1 only showing the application of one end of a twisted paper cord section to the opened-out end of an adjacent cord section prior to the wrapping operation;

Fig. 3 is a view of the adjacent ends of a pair of twisted paper cord sections completely spliced; and

Fig. 4 is a fragmentary plan view of a section of woven rug fabric wherein the woven strands are composed of twisted paper cord spliced in accordance with the present invention without any undue bulkiness or imperfections appearing in the fabric in the area of the cord splices.

Referring now more particularly to the drawing it will appear that the numeral **5** indicates a section of a twisted paper cord or twine as it comes from the paper twisting mechanism for winding on a spool. These extents of twisted paper cord are of limited length and at the outer end of an extent **5**, in order to connect the adjacent end of another twisted paper cord or twine section **6** thereto to provide an unbroken length of cord or twine, means must be employed for connecting the adjacent ends of the strands **5** and **6**. For this purpose the outer end of the twine section **5** is modified by being unwrapped for a short distance, as will appear.

Each section of twisted paper cord or twine is composed of a width of paper tightly twisted into a tight cord or twine formation. According to the present method when the end of an extent of cord or twine is reached during the winding operation the attendant or operator immediately untwists the extremity of the cord or twine **5**, as mentioned above, to produce a relatively wide single layer concave area **7**. The adjacent extent of the next section of paper cord or twine **6** which is to be joined to the extent **5** has its adjacent end portion, for about the over-all length of the opened up portion **7** of the strand **5**, dipped into a quick drying rubber latex adhesive, as indicated at **8** in Figs. 1 and 2. Said adhesive-dipped portion of the end of the strand **6** is then placed centrally within the opened out portion **7** of the strand **5**, whereupon said opened out portion **7** of the strand **5** is then manually tightly twisted about the adhesive coated end portion **8** of the strand **6** with the result that the spliced extent **9** of the composite cord **5—6** of Fig. 3 results, with the adhesive quickly setting to unite the ends of the spliced cord sections, in addition to the wrapping.

This same method of knotless splicing of adjacent ends of twisted paper cord sections is carried out during the winding of the twisted paper cord onto spools, and during the winding of the extended cord lengths from the spools into the packages which are supplied to the loom.

During the operation of the loom unbroken lengths of spliced paper cord, yarn or twine are, therefore, supplied to the loom with the result that in the finished woven fabric, as shown in Fig. 4, there will be no surface imperfections which might require subsequent treatment and "mending" which was the case when knotted extents of twine were used. Due to the fact that the spliced ends of the twine sections **5** and **6** are scarcely more bulky than the major extents of the twine or cord, as shown in Fig. 3, in the finished fabric where these spliced portions of the cord or yarn appear, as shown at **9** in Fig. 4, the slight additional bulkiness creates no visual imperfection which requires subsequent attention or "mending." In fact, when the fabric is subjected to pressure the spliced portions of the cord or yarn actually defy visual detection and there are no flaws or weak-

nesses in the finished product because the spliced portions are very strong.

The knotless spliced twisted paper cord or twine can be produced at a minimum of expense and with relative facility during the winding operation, and the use of knotless spliced twisted paper cord or twine in a woven fabric eliminates the subsequent step of carefully examining the woven rug or fabric after the weaving operation for mending, treating or otherwise eliminating imperfections appearing therein inherent to the knotted ends of conventionally joined twisted paper cord sections.

Various changes and modifications may be made without departing from the spirit of the invention and all of such changes are contemplated as may come within the scope of the appended claims.

What is claimed as the invention is:

1. As a new article of manufacture, an elongated twisted paper cord for rug weaving, including at least two endwise adjacent sections having their adjacent end portions permanently connected by a splice, each section of the cord being composed of a strip of paper of a substantial width wrapped into tight cord formation, a twisted end portion of one section being wrapped and secured axially within the adjacent end portion of another section.

2. As a new article of manufacture, an elongated twisted paper cord including at least two endwise adjacent sections having their adjacent end portions permanently connected by an adhesive bonded splice wherein a twisted end portion of a first section is telescopically engaged within and covered by an outer wrapping of the adjacent end portion of a second section, and an adhesive applied to the telescoped portions of said sections internally of the outer wrapping of the second section.

3. In the method of manufacturing an elongated unbroken twisted fiber cord, the steps of preparing a plurality of separate cord sections, each of considerably less length than the overall length of the final cord, by tightly twisting, for each of the cord sections, a thin sheet of fiber material into a compact small diameter cord section, unwrapping an end portion of one cord section into a spoon-like formation, coating the adjacent twisted end portion of another cord section with an adhesive, placing said adhesive coated end portion of the second cord section centrally on the unwrapped portion of the first cord section coaxially with the twisted portion of the first cord section, and finally rewrapping the latter tightly about the coated portion of the second cord section to permit the adhesive to form a permanent internal bond between the engaged portions of the two cord sections.

4. In the process of winding successive twisted paper cord sections onto a spool, the steps of halting the winding operation when the free end of a first cord section is reached and unwrapping an extent of said free end portion, dipping the outer end of the next twisted paper cord section into a fluent quick drying adhesive, inserting said dipped end of the second cord section into the unwrapped end portion of the first cord section and axially thereof, then tightly rewrapping said portion of the first cord section about the inserted portion of the second cord section and compressing the wrapping, and finally continuing the winding operation to produce on the spool an elongated unbroken twisted paper cord of a length equal to the sum of the connected sections.

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