

No. 698,879.

Patented Apr. 29, 1902.

E. K. WARREN.
STIFFENING CORD OR TAPE.

(Application filed Dec. 3, 1900.)

(No Model.)

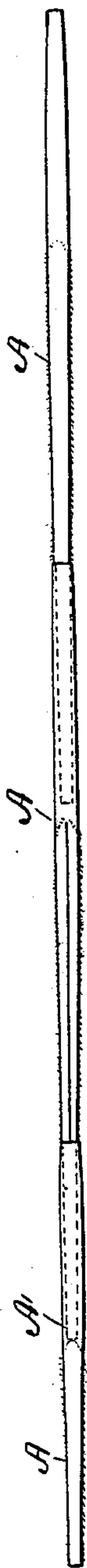


Fig. 1

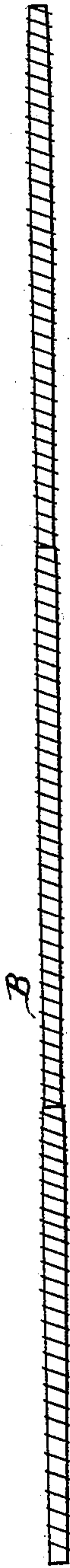


Fig. 2

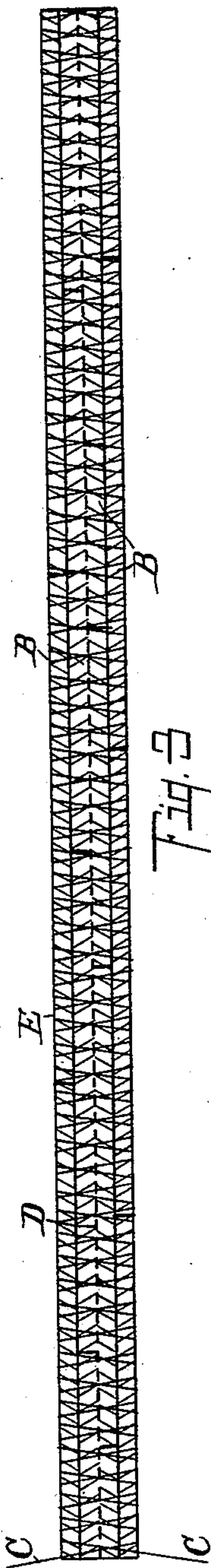


Fig. 3



Fig. 4

Witnesses:

Alice E. Houghton
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UNITED STATES PATENT OFFICE.

EDWARD K. WARREN, OF THREEOAKS, MICHIGAN, ASSIGNOR TO THE
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STIFFENING CORD OR TAPE.

SPECIFICATION forming part of Letters Patent No. 698,879, dated April 29, 1902.

Application filed December 3, 1900. Serial No. 38,439. (No model.)

To all whom it may concern:

Be it known that I, EDWARD K. WARREN, a citizen of the United States, residing at the village of Threeoaks, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Stiffening Cords or Tapes, of which the following is a specification.

This invention relates to improvements in stiffening cords or tapes, and is an improved construction of stiffening cords or tapes in which quill substances are utilized.

The object of the invention is primarily an improvement in the stiffening-strand itself, although when strands are assembled they form an improved stiffening-blade. The strands are improved by utilizing small quills in such a manner that the quill will not need to be split or reduced to fiber, but will be preserved in its natural form, with the enamel portion to the exterior, which of course secures the greatest rigidity for a given weight of the material. The improved structure also utilizes the small-sized quills, as those of the hen and duck or the small feathers of the turkey, which it has not been possible heretofore to do economically. Further objects relating to details will appear in the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in this specification.

The invention is clearly defined and pointed out in the claims.

A structure fully embodying the features of my invention is fully illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detailed view of the quills in process of assembling into the strand. Fig. 2 is a detail view of the completed strand, indicating the method of manufacture. Fig. 3 is detail view of a blade made up of four such strands, the method of joining the same together being indicated. Fig. 4 is a detail transverse sectional view through the blade appearing in Fig. 3.

In the drawings similar letters of reference refer to similar parts throughout the several

views, and all of the views are shown considerably enlarged.

Referring to the lettered parts of the drawings, A A A are a series of small quills from which the plumage has been stripped or trimmed and both ends of which have been clipped or cut off. The pith may be bored out by a suitable drill or it may be punched out. The plumage end of the quill is inserted into the hollow end of the next succeeding quill after having first been dipped into a glue or proper cement, and the small quills are strung together in this way indefinitely after having been prepared as stated. Where a fine quality of cement is used and the parts carefully crowded together, the strand thus made will be complete. The quills when softened and moistened will adhere to each other without cement. However, great care will be required to construct it in this way. So I prefer as these quills are stuck together, as I have indicated, to embrace them with a thread B', which makes them into a complete strand B, as clearly appears in Fig. 2. Several of these strands can then be placed side by side and securely wound together by wrapping-threads C C, as clearly appears in Fig. 3, and where more than two strands are thus wound together a row of stitches D should extend through the center, which will hold the wrapping-threads in position exactly according to the method appearing in United States Patent No. 389,883, issued to me on the 25th day of September, 1888. After the strands have been thus assembled they can be utilized as a stiffener without any further treatment. I, however, prefer to treat the blade in the manner described in Letters Patent No. 559,827, issued to myself and Jonas H. Holden on the 12th day of May, 1896, when the wrapping-threads will be forced into the quill substance, and the quill substance itself will be compressed and flattened into a very thin blade of a very superior quality when the light grade of material of which it is made is taken into consideration. I also desire to state that the naked strands or the strands as I show them in Fig. 2 can be incorporated into blades by a braiding-machine, as clearly

appears in United States Letters Patent No. 611,298, issued to me on the 29th day of September, 1898, and the strands can be used also in woven fabrics. Single strands can be
5 used where desired.

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

1. In a stiffening material, a strand comprising a series of quills denuded of their plumage, the plumage end of each quill of the series being inserted and cemented into the hollow end of the next succeeding quill.
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2. In a stiffening material, a strand comprising a series of quills denuded of their plumage, the plumage end of each quill of the series being inserted into the hollow end of the next succeeding quill.
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3. In a stiffening material, a strand comprising a series of quills denuded of their plumage, the plumage end of each quill of the series being inserted and cemented into the
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hollow end of the next succeeding quill and a suitable wrapping-thread around the whole.

4. In a stiffening material, a strand comprising a series of quills denuded of their plumage, the plumage end of each quill of the series being inserted into the hollow end of the next succeeding quill and a suitable wrapping-thread around the whole.
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5. In a stiffening-blade, made up of a series of strands consisting of a series of quills denuded of their plumage, the plumage end of each series being inserted into the hollow end of the next succeeding quill of the series, the strands being retained together by a suitable wrapping-thread, as specified.
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In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

EDWARD K. WARREN. [L. S.]

Witnesses:

MORRIS G. MCGAWN,
MARY A. DAVIDSON.