(Specimens.)

E. K. WARREN.

WOVEN STIFFENING FABRIC.

No. 588,301. Patented Aug. 17, 1897.

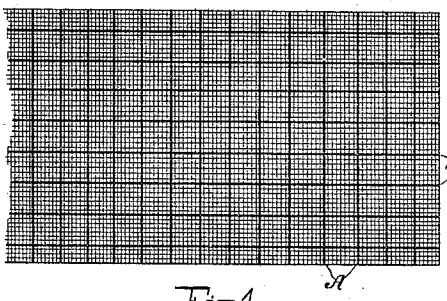


Fig. 1

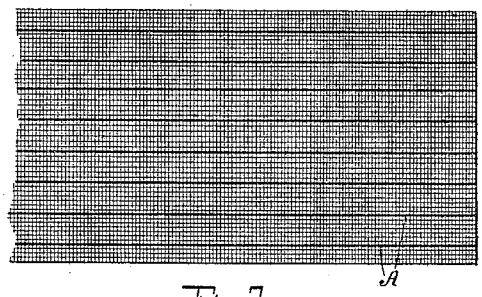


Fig. 2

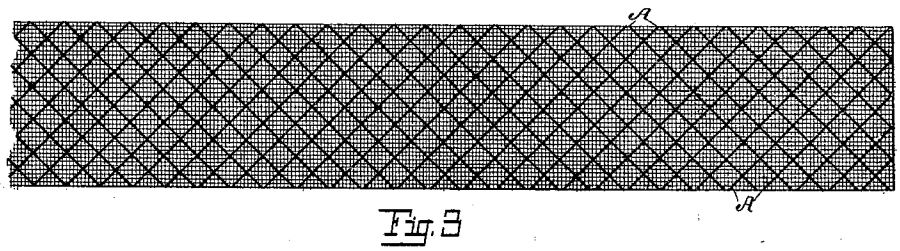


Fig. 3

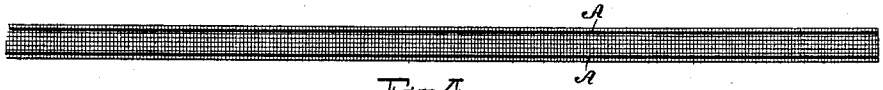


Fig. 4

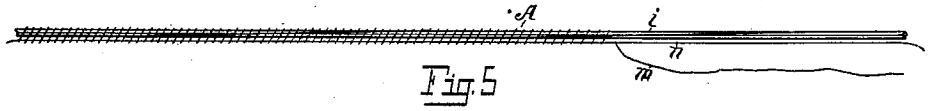


Fig. 5

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UNITED STATES PATENT OFFICE.

EDWARD K. WARREN, OF THREE OAKS, MICHIGAN.

WOVEN STIFFENING FABRIC.

SPECIFICATION forming part of Letters Patent No. 588,301, dated August 17, 1897.

Application filed January 15, 1895. Serial No. 534,966. (Specimens.)

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 Three Oaks, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Woven Stiffening Fabrics, of which the following is a specification.

My invention relates to improvements in woven stiffening fabrics to be used in place of the ordinary haircloth for sustaining the puffs in sleeves of garments or the material of garments generally in position whether it be to hold them in a smooth flattened condition or to hold them in puffs or rolls, as the case may be. Heretofore the material for this purpose has either been made of cloth that has been sized, which rapidly breaks down as soon as it is subjected to moisture or heat, or else has been made of haircloth, the hair being hair similar to horsehair woven into the material as filling, the warp being any convenient thread for the purpose. This haircloth is open to the grave objection that it is stiffened in but one direction and will be pressed down in that way. Another very serious objection to haircloth is that in fastening the same into garments the utmost care is required to properly secure the cut ends of the hair in place, which, it will be understood, is a matter of very great difficulty.

My invention has for its objects the overcoming of these objections—that is, first, to supply a stiffening fabric which shall not be liable to destruction from the ordinary temperature of the body of the wearer or from dampness; second, to provide a material that can be readily and securely attached to a garment wherever it may be required; third, to provide an improved construction of such material which shall make it durable and at the same time cheap to manufacture; fourth, to provide a cloth in which comparatively short stiff resilient fibers or hair are employed to effect a stiffening; fifth, to provide means of utilizing such fibers to the best advantage; sixth, to provide a convenient means whereby said fiber or hair can be used successfully as a warp. I accomplish these objects of my invention by the devices shown in the accompanying drawings, in which—

Figure 1 shows a section of the material embodying my invention, in which a part of both the warp and filling are composed and constructed in accordance with my invention. Fig. 2 is a view of another specimen of material embodying the features of my invention with the stiffening-strands used as a warp only. Fig. 3 shows another special arrangement of the same to accomplish the purpose. Fig. 4 shows my invention adapted to very narrow material, as a tape. Fig. 5 is an enlarged detail view and shows another specimen of the strand where it is constructed of quill fiber.

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

In the preferred construction of my improved fabric (shown in Fig. 1) at intervals in the warp and at short intervals in the filling strands are inserted, which strands are constructed in a composite manner. These are preferably made of the fiber of quills of feathers, which are wound similar to the material composing my improved featherbone described in Patent No. 286,749, dated October 16, 1883, with the exception that incorporated with the material is a continuous flexible thread *n*. This affords longitudinal strength to the strand, which is necessary in order to properly handle and manipulate the same to place it in the material.

Fig. 5 shows a portion of the warp and filling enlarged and showing the method of manufacturing the same from the fiber of the quills of feathers *i*. The strips of feathers *i* taper toward each end frequently, and these are lapped together and are incorporated into a strand with the thread *n* by being wound thereon along with thread *m*.

The fabric can be made entirely of the strands A which I here describe, but that would result in a very stiff material, besides adding considerably to the weight and bulk, and I prefer to incorporate this warp and filling in a lighter fabric, as indicated by the spaces between, these strands of the material being indicated by the heavier lines in each instance and marked with the letter A.

I have shown several modifications of my invention. Fig. 2 shows the device constructed in the usual manner with the warp only. Fig. 3 shows a peculiar modification of the

warp or strands in which they cross the strip of material diagonally. This construction, it will be observed, gives the same strength to the material as that indicated in Fig. 1, with possibly some advantages in the means of attaching the same. At present I accomplish the production of this fabric (shown in Fig. 3) by inserting the stiffening-strands with a needle. Fig. 4 shows the material woven with other fabric to form a tape. This will be found desirable for attaching it to the edges of garments to keep them from forming into wrinkles. The width of the web of the fabric is immaterial.

Having thus described my invention, I desire to state that the description will certainly indicate that it is capable of very considerable variation and a great variety of uses.

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

1. A stiffening fabric, composed of warp and weft threads, one, at least, of which shall contain resilient strands formed of a continuous longitudinal flexible thread, with splints or fiber of the quill portion of feathers distributed along the same and having overlapping meeting ends, and a wrapping-thread, binding said splints or fibers to the longitudinal thread, as specified.

2. A resilient strand, consisting of a continuous longitudinal flexible thread, splints or fibers of the quill portion of feathers distributed along the same and having overlapping meeting ends, and a wrapping-thread binding said splints or fibers to the longitudinal thread, as specified.

3. A stiffening fabric, composed of warp and weft threads, one at least of which shall contain resilient strands formed of a continuous longitudinal thread with fibers or splints of stiff resilient material distributed along the same and having overlapping meeting ends, and a wrapping-thread binding said fibers or splints to the longitudinal thread, as specified.

4. A resilient strand, consisting of a continuous longitudinal flexible thread, splints or fibers of stiff resilient material distributed along the same and having overlapping meeting ends, and a wrapping-thread binding said splints or fibers to the longitudinal thread, as specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

EDWARD K. WARREN. [L. S.]

Witnesses:
WM. C. HALL,
J. H. AMES.