No. 709,622. Patented Sept. 23, 1902.

E. K. WARREN & J. H. HOLDEN.

WOVEN FEATHER FABRIC.

(Application filed Nov. 21, 1899.)

(No Model.)



Fig. 1

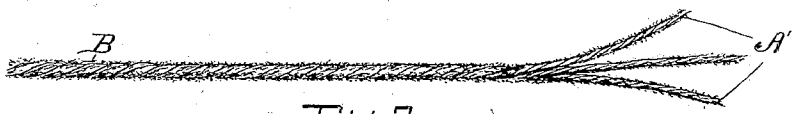


Fig. 2

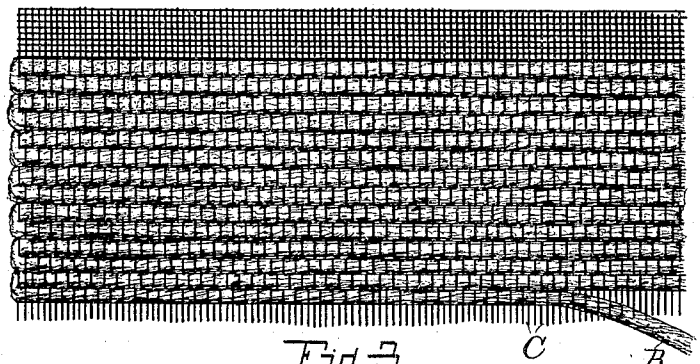


Fig. 3

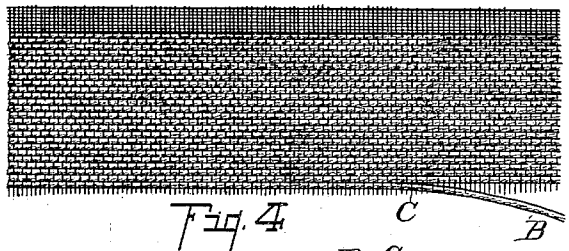


Fig. 4

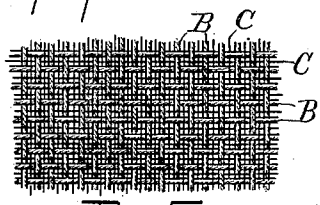


Fig. 5

Witnesses:

Alice Houghton

Otis A. Earl

Inventors

Jonas H. Holden & Edward K. Warren

By Fred L. Chaffee

Att'y.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD K. WARREN AND JONAS H. HOLDEN, OF THREEOAKS, MICHIGAN.

WOVEN FEATHER FABRIC.

SPECIFICATION forming part of Letters Patent No. 709,622, dated September 23, 1902.

Application filed November 21, 1899. Serial No. 737,830. (No specimens.)

To all whom it may concern:

Be it known that we, EDWARD K. WARREN and JONAS H. HOLDEN, citizens of the United States, residing at the city of Threeoaks, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Woven Feather Fabrics, of which the following is a specification.

This invention relates to improvements in woven feather fabrics, and particularly to an improved means of utilizing down or plumage in such woven fabrics.

The object is to provide a fabric in which down or plumage is incorporated with other material in the formation of strands for use in woven fabrics.

Still further objects will definitely appear in the detailed description to follow.

We accomplish the objects of our 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 our invention and the method of carrying it out is illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows a roll formed of a combination of down, plumage, and other material and the method of forming it into a strand. Fig. 2 illustrates the doubled and twisted strand. Fig. 3 illustrates a piece of the fabric formed of the doubled and twisted strand. Fig. 4 illustrates a piece of the fabric formed with a single strand. Fig. 5 illustrates the fabric in which both warp and weft are made up of our improved strands.

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

In carrying out our invention we first mix the down and feathers, with the mid-ribs removed, with wool, cotton, or other fibrous material and card the same together, forming it into rolls, as clearly appears in Fig. 1 at A. These are spun down into a smaller cord or strand A′, which may be used singly for forming fabric, as appears in Figs. 4 and 5, in Fig. 4 it being shown as weft with a fine warp C, and in Fig. 5 it being shown as warp and weft, and it may be accompanied by finer strands of fibrous material, as there appears. This strand A′ may be doubled and twisted or three strands put together and twisted, or any number for that matter, into a coarse strand or rope B, which may be used as warp or weft, appearing in Fig. 3 as weft in a piece of fabric. We prefer to use in this connection as material to be mixed with the feathers and down a wool of long fiber; but it will be readily understood that any fibrous material capable of being carded can be satisfactorily mixed with the down or feathers. This gives the strand great additional strength and enables a very durable material to be manufactured which at the same time possesses all of the valuable qualities and advantages of the feather material incorporated—that is, it is very light and can be made very thick and still be very light. When properly woven and formed, the fabric is substantially waterproof.

We desire to remark that we are aware that feathers have heretofore been incorporated into fabrics; but the aim heretofore has been to produce an ornamental effect with the feathers or to produce a pile fabric or a fabric having a nap. We believe, however, that we are the first to incorporate feathers into the body of the material itself, so as to form the substantial part of the fabric.

Our invention is particularly adapted and desirable for use where a waterproof fabric is required, due to the fact that while it is waterproof the air circulates very freely through the same, and it has, in addition, many of the desirable qualities of woolen fabrics and is adapted to a great variety of uses, being adapted to the same uses to which woolen fabrics are adapted, and possesses some advantages over the same for some uses on account of its very light weight and waterproof qualities.

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

1. A fabric made up of strands of feathers and other retaining fibers twisted together into close compact strands as specified.

2. A fabric containing in its warp or weft,

strands made up of feathers and other fibers incorporated and twisted together into close compact strands, as specified.

3. A strand for use in making fabrics formed out of feathers twisted together into close compact strands, as specified.

In witness whereof we have hereunto set our hands and seals in the presence of two witnesses.

EDWARD K. WARREN. [L. S.]
JONAS H. HOLDEN. [L. S.]

Witnesses:
WM. C. HALL,
DELLA C. WARREN.