

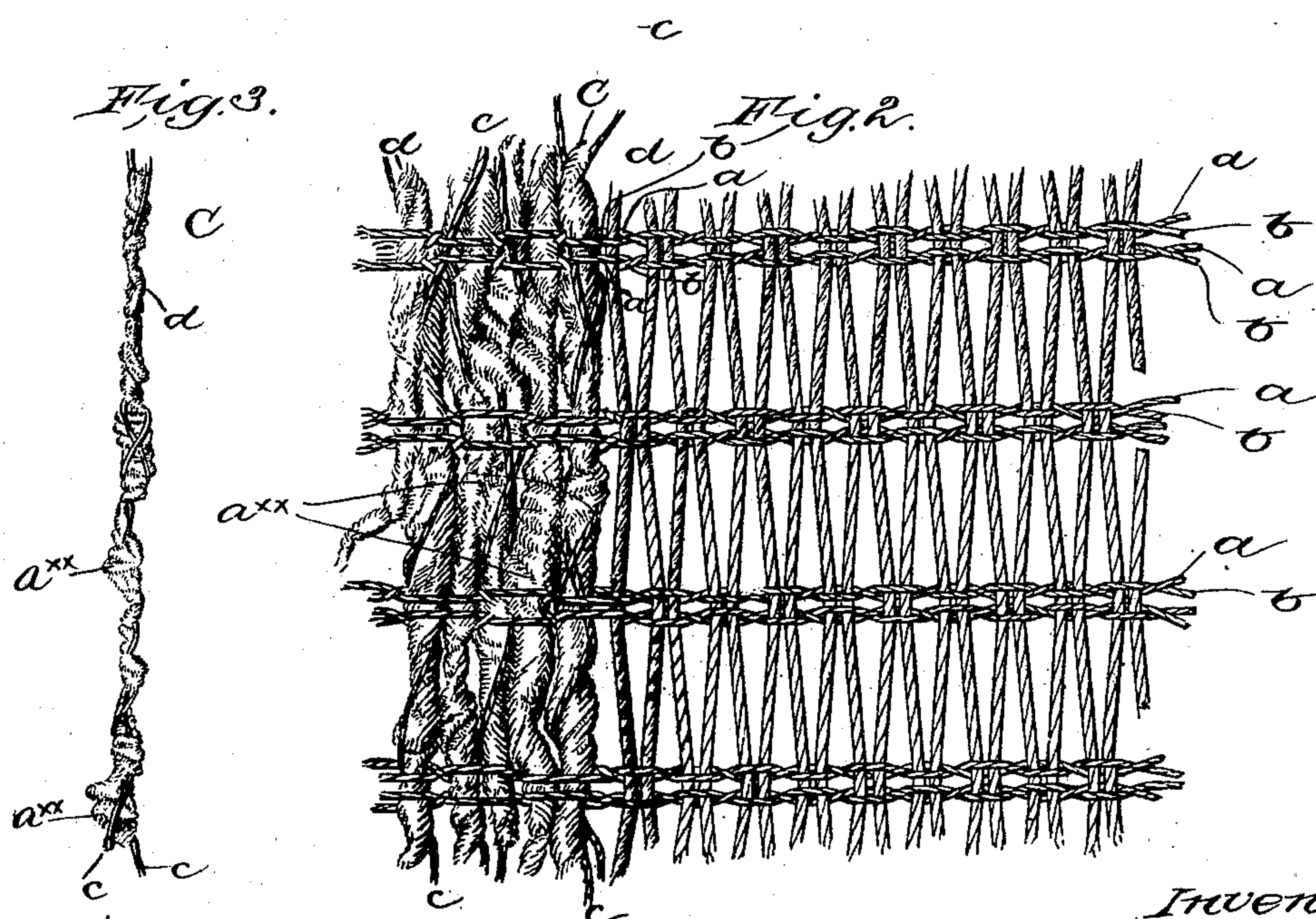
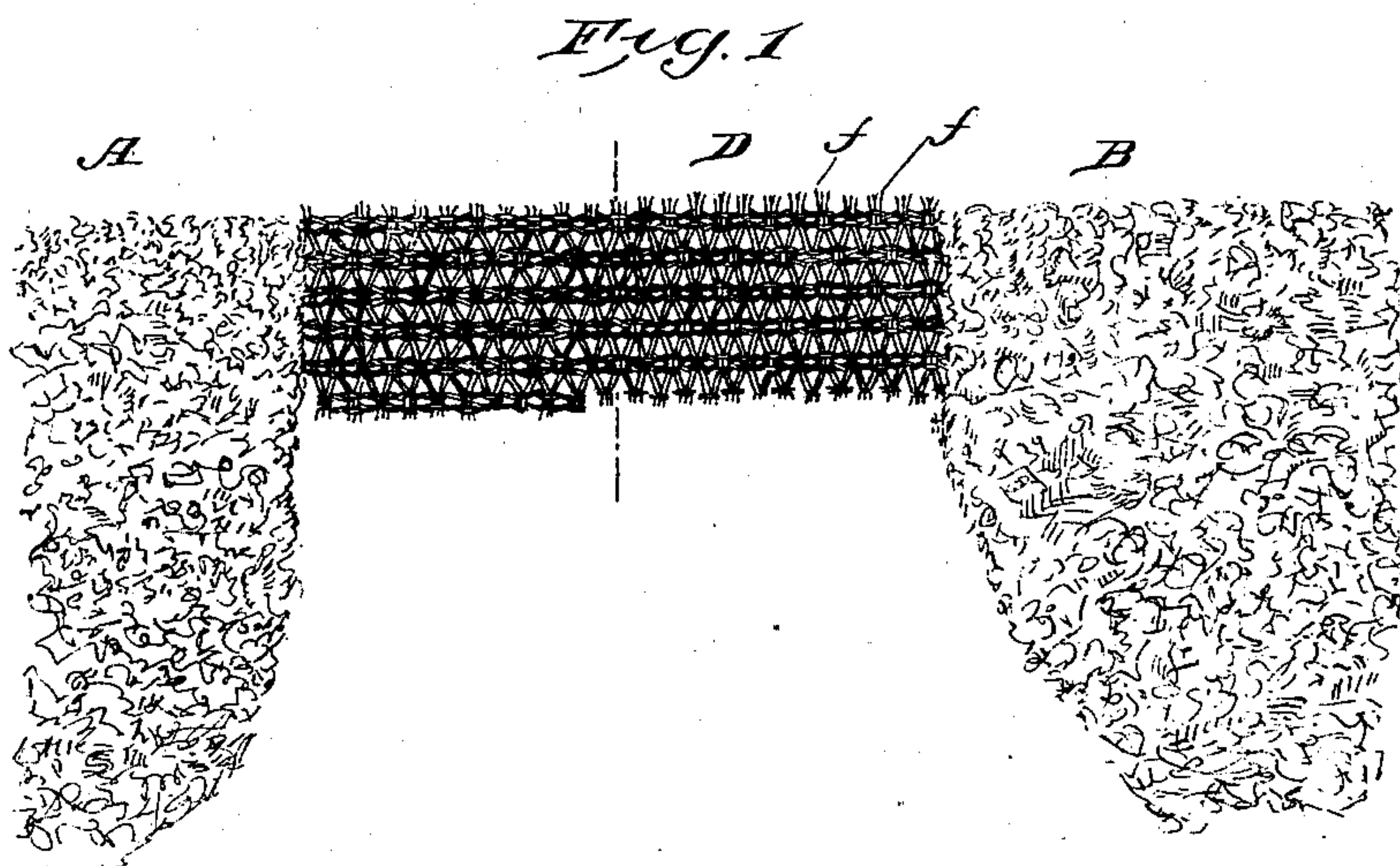
No. 671,497.

Patented Apr. 9, 1901.

H. W. SMITH.
WOVEN FABRIC.

(Application filed Sept. 8, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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WOVEN FABRIC.

SPECIFICATION forming part of Letters Patent No. 671,497, dated April 9, 1901.

Application filed September 8, 1900. Serial No. 29,364. (No specimens.)

To all whom it may concern:

Be it known that I, HARRY W. SMITH, a citizen of the United States, residing at Grafton, county of Worcester, State of Massachusetts, have invented an Improvement in Woven Fabrics, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention to be hereinafter described relates to woven fabrics, and more particularly to such fabrics wherein the two faces present moisture-absorbing surfaces, such as toweling and the like. Such forms of fabrics, known as "Turkish toweling," have heretofore been produced with moisture-absorbing surfaces by forming on each face thereof projecting warp loops or pile by the process of terry-weaving, wherein the warps at the moment of beat-up are slackened somewhat to permit the lay to double up or form the slack of each warp into a loop or pile, which slackness is at once bound in by the weft or filling as the lay reaches the fell. In such form of fabric, however, the warp-threads, which form the moisture-absorbing surface of the towel, are necessarily spun or twisted sufficiently hard to withstand the strain to which they are subjected during the process of weaving, and as a consequence their moisture-absorbing qualities are much impaired, since the harder the twist the less readily will they absorb moisture. Moreover, unless such fabrics are closely woven—that is, unless the weft or filling is well beaten up—the warp-loops are liable to be pulled out or elongated unequally, thus rendering the surface of the fabric uneven and materially destroying its moisture-absorbing quality.

It is one of the objects of my present invention to overcome the objections above pointed out and to produce a loosely-woven fabric in which the warp and weft or filling shall be securely tied together and in which both faces shall present moisture-absorbing surfaces.

To this end my invention consists of a fabric formed of cross-woven warp-threads and a filling or weft tied in by the crossings of the warp and consisting of a loose, bunched, or knotty yarn, all as will be hereinafter more

fully described, and definitely pointed out in the claims.

While in the present embodiment of my invention I have described the same as more especially adapted for toweling, it is to be understood, of course, that my invention is not necessarily limited thereto, as the fabric is adapted to be employed whenever a moisture-absorbing surface is desired.

In the drawings, Figure 1 is a plan view showing a portion of a fabric embodying my invention and woven as a series of towels joined by an intermediate portion, which being severed midway between the sections constituting the towels proper may constitute a border, part of the fabric being broken away. Fig. 2 is an enlarged detail showing more fully the relative position of the threads. Fig. 3 shows the weft or filling in detail.

The warp-threads *a b* may be of any desired character; but I preferably form them fine or hard-twisted for a purpose that will hereinafter appear.

The weft or filling thread *C* is especially designed for the purpose of forming a highly-absorbent fibrous surface for the fabric, and preferably consists of a plurality of body-threads *c*, having the requisite strength to withstand the strain incident to weaving, which are laid or twisted about a loosely-spun yarn *d*. In order to increase the moisture-absorbing quality of the weft or filling the loosely-spun yarn *d* is kinked or bunched at intervals to form enlargements *a^{xx}*, and to retain the loosely-spun yarn *d* in this kinked or bunched condition the body-threads *c* are preferably laid or twisted about the same in reverse order, as will clearly appear from Fig. 3. While this form of weft or filling is preferred, it is to be understood that it is not essential, since the bunches or kinks of the loosely-spun yarn *d* may be held in position in other ways, as will be obvious, it being only necessary that the bunches or kinks be prevented from moving longitudinally of the body thread or threads *c*, as during the weaving operation.

In order to secure the full moisture-absorbing quality of the weft or filling, it is necessary that there shall be a loose relation or space between the same to permit the kinks

or bunches of the loosely-spun yarn *d* free opportunity for expansion during the act of absorbing moisture. On the other hand, it is essential to the proper wearing quality of the fabric that the weft or filling shall be securely held by the warp-threads, and this twofold result is secured by arranging the warps in sets—two pairs to each set—and cross-weaving said pairs of warp to bind the weft or filling by the crossings of the warps of the pair in each set, as will be evident from Fig. 2, wherein the warps *a b* constitute a pair, and two such pairs constitute a set, the weft or filling *C* being bound securely in place by the crossings of the warp-threads of each pair in each set. This particular arrangement of sets of warp-threads is not essential, of course, since any disposition of such threads in cross-weaving to properly bind the weft or filling in position would be within the scope of the invention.

The warp-threads, as hereinbefore stated, are preferably of relatively fine character and may be hard-twisted, if desired, the effect of which is that under the tension placed upon said threads during weaving they sink or bury themselves well into the fiber of the loosely-spun yarn *d*.

The body-threads *c*, which give the requisite tensile strength to the weft or filling *C* and hold the bunches or kinks in position, are likewise embedded in the loose fiber of the loosely-spun yarn *d*, thus leaving the surface of the fabric formed of the projecting kinks or bunches of the said yarn, which, being highly absorbent, present surfaces particularly well adapted for toweling and like purposes. Moreover, the crossings of the warp-threads and the reverse windings of the body-threads *c* of the weft or filling mutually contribute to properly holding the bunches or kinks of the loosely-spun yarn *d* in position even under the most severe usage.

In weaving the fabric constituting my invention I may, if desired, weave the same with moisture-absorbing surfaces, as above explained, continuously for some of the uses to which the fabric may be put; but where I especially design the same for toweling I may weave the fabric in sections, as represented in Fig. 1, said fabric comprising alternately a section A, having moisture-absorbing surfaces, then a section D, wherein a weft or filling of any usual or desired character may be employed, then a section B, the same as section A, and so on. By thus forming the section D of a fine or hard-twisted weft or filling *f* instead of the moisture-absorbing weft

or filling *C* and separating the sections A and B, as on the line *F*, the said sections A and B each being formed of the proper length to constitute a towel, the said sections or towels can be provided with a border, which can be properly hemmed or sewed, as desired.

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

1. A woven fabric for toweling and the like, comprising cross-woven warp-threads, and a loosely bunched or kinked weft or filling thread tied by the crossing of the warp-threads leaving the bunches or kinks exposed on the faces of the fabric to constitute moisture-absorbing surfaces.

2. A loosely-woven fabric comprising fine or hard-twisted cross-woven warp-threads, and a weft or filling thread tied by the crossings of the warp-threads and formed of a body or foundation thread and a loosely-spun yarn carried thereby and having kinks or bunches constituting moisture-absorbing surfaces for said fabric.

3. A woven fabric comprising fine or hard-twisted cross-woven warp-threads, and a weft or filling thread tied by the crossings of the warp-threads, said weft or filling thread being formed of a loosely-spun and kinked or bunched yarn, and a plurality of body or foundation threads for holding the kinks or bunches in position, the said warp-threads being embedded in the loosely-spun yarn where they cross the latter, thereby producing moisture-absorbing surfaces on the fabric, formed by the bunches or kinks of the loosely-spun yarn.

4. A woven fabric comprising fine or hard-twisted cross-woven warp-threads, and a weft or filling thread tied by the crossings of the warp-threads, said weft or filling thread being formed of a loosely-spun and kinked or bunched yarn and a plurality of body or foundation threads reversely wound about the same and embedded therein to hold the kinks or bunches in place, the said warp-threads being also embedded in the loosely-spun yarn where they cross the latter, whereby the fabric is provided with moisture-absorbing surfaces formed of the bunches or kinks of the loosely-spun yarn.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY W. SMITH.

Witnesses:

GEO. W. GREGORY,
ROBT. P. HARRIS.