

(Specimens.)

J. W. GREENE, Jr., & G. C. MOORE.  
ELASTIC FABRIC.

No. 360,431.

Patented Apr. 5, 1887.

Fig:1.

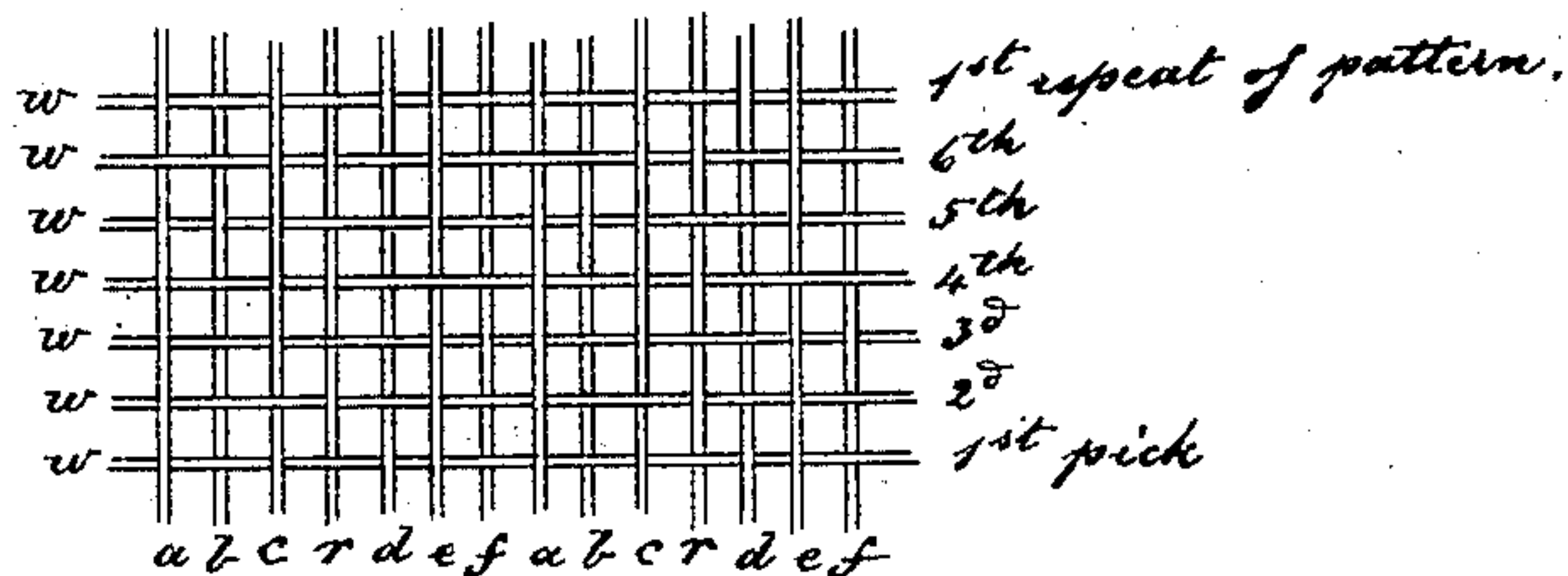


Fig:2.

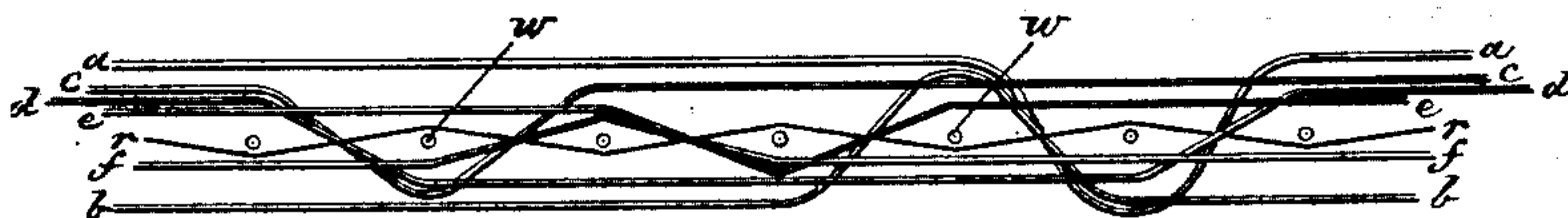


Fig:3.

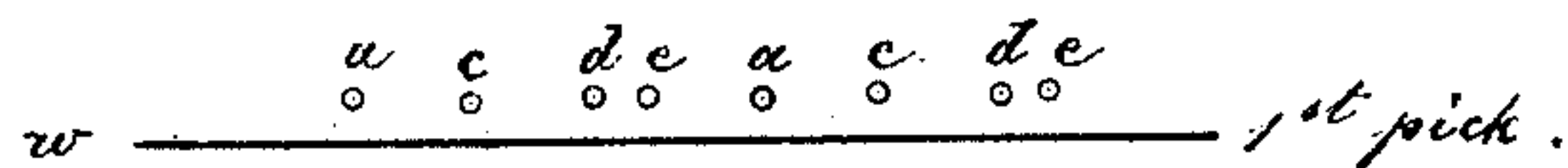


Fig:4.



Fig:5.



Fig:6.



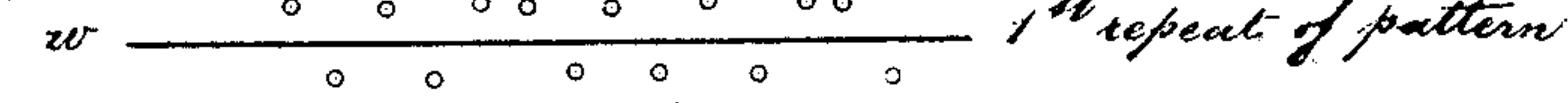
Fig:7.



Fig:8.



Fig:9.



Witnesses.

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# UNITED STATES PATENT OFFICE.

JOSEPH W. GREEN, JR., AND GEORGE C. MOORE, OF EAST HAMPTON, MASS.

## ELASTIC FABRIC.

SPECIFICATION forming part of Letters Patent No. 360,431, dated April 5, 1887.

Application filed May 8, 1886. Serial No. 201,536. (Specimens.)

*To all whom it may concern:*

Be it known that we, JOSEPH W. GREEN, Jr., and GEORGE C. MOORE, of East Hampton, county of Hampshire, and State of Massachusetts, have invented an Improvement in Elastic Fabrics, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to produce a novel elastic fabric having a twilled face and back of different colors by the employment, as will be hereinafter described, of face and back warps, a rubber warp, and one shuttle-thread, the fabric being completed without the employment of the usual binder-warps.

In the fabric herein to be described the west employed crosses the rubber warp at opposite sides at alternate picks, thus binding the rubber at every pick and preventing it from materially relaxing in the fabric with relation to the fibrous warps after removing the fabric from the loom. The rubber warps alternate, as will be hereinafter described, with one face and one back thread at each pick, thereby drawing the face and back threads together into the fabric and making the twill appear more prominently.

In the manufacture of our improved fabric we employ seven harness-frames, three of which contain the face-warps, three the back-warps, and one the rubber warp, each face-warp being up for five picks and down for one pick, the back-warps being each up for one pick and then down for five picks, the rubber warp being up for one pick and down for the next, alternating, as will be stated, with one face and one back warp at every pick.

In our improved fabric the face and back are of different colors—as, for instance, if for boot-web, the face will be black and the back white.

Figure 1 in plan view shows the face of a piece of fabric embodying our invention, the threads being separated to better exhibit their manner of crossing. Fig. 2 is a longitudinal section of our fabric with the threads separated. Figs. 3 to 8 show the position of the warp and west in the first to the sixth pick, inclusive; and Fig. 9 shows the position of the threads for the first repeat of the pattern, it being the same as Fig. 3.

Referring to the drawings, *a*, *c*, and *e* repre-

sent the face-warps; *b*, *d*, and *f*, the back-warps; *r*, the rubber warp, and *w* the west.

Viewing Figs. 3 to 8, it will be seen that the face-warp *a* is up for the first to the fifth pick, inclusive, and is down for the sixth pick, which pick completes the pattern, it then rising and remaining up for five picks. The back-warp *b* is down for the first pick and remains down until the fifth pick, when it is raised, but it goes down for the sixth pick. The face-warp *c* is up for the first pick, but goes down for the second pick, and remains down for one pick, rising at the third pick, and remaining up for the fourth, fifth, and sixth picks, and also for the first pick of the repeat, as in Fig. 9. The rubber warp *r* is down on the first, third, and fifth picks, and up on the second, fourth, and sixth picks, alternately, with one face and one back, as shown, at each pick. The back-warp *d* is up on the first pick, down on the second pick, remaining down until after the sixth pick. The face-warp *e* is up on the first pick and remains up for the second and third picks, going down on the fourth pick and coming up for the fifth pick, remaining up for the sixth pick. The back-warp *f* is down for the first and second picks, is up on the third pick, and down on the fourth, fifth, and sixth picks. The shed following the sixth pick is just the same as the first, or as shown by Figs. 9 and 3.

From the foregoing it will be seen that the rubber alternates with one face and one back warp at each pick, the back and face warps binding the west to the rubber—as, for instance, supposing the first pick to have been made when the thread *r* is raised for the second pick, the rubber rises, one face-thread, *c*, and one back-thread, *d*, fall, and the west is inserted; then for the third pick the rubber is lowered and a face-thread, *c*, and a back-thread, *f*, are raised and the west is thrown, and then for the fourth pick the rubber warp *r* is lifted and the face-warp *e* and the back-warps *f* are lowered, and so on, as shown in Figs. 2 to 8.

Herein we have shown enough warp-threads for two dents of the reed, each dent containing three face and three back warp-threads and one rubber warp-thread. These threads may be single or double in the same heddle.

We are aware that elastic fabrics have been



made wherein the warps are carried by eight harnesses—three for the face-warps, three for the back-warps, one for a binder-warp, and one for a rubber warp, the rubber and binder alternating at every pick, the face-warp going down with the rubber warp at every sixth pick, a back-warp coming up with the rubber at every sixth pick, the binder-warp stitching together, as it were, the back and face of the fabric between each rubber warp, the fabric being twilled at both sides. We are also aware that an elastic fabric has been made wherein the warps are carried by seven harnesses—four for the face and two for the back warps and one harness for the rubber warps, the face and back being of different colors, the binder being omitted, the rubber being bound above and below at every second pick, the pattern being completed with every eighth pick, the fabric being twilled at its face and plain woven at its back. To twill the fabric last referred to at both face and back would require nine harnesses.

In interweaving the warp and weft, as stated, the threads in each dent of the reed co-operating with the weft form a sort of a braid which binds the rubber closely, preventing it from unduly slipping back, as is the case in webs where a binder-warp is employed.

The closer or firmer that the rubber is

bound into the fabric the less it slips back into the fabric when the latter is cut into gores for use in boots and shoes and other wearing-apparel.

In our improved fabric it will be seen that each warp-thread, both in the back and face of the fabric, acts as a binder, as each one alternates with a rubber warp, and the fabric has a very close and fine twill at both face and back.

We claim—

As an improved article of manufacture, the herein-described elastic fabric having a twilled face and twilled back, the said fabric containing six sets of fibrous warp-threads and a rubber warp united by a weft-thread, three sets of the said fibrous warps constituting the back and three constituting the face, each rubber thread alternating with one face and one back thread at each pick, substantially as described, the rubber being thereby bound into the fabric at each pick, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOS. W. GREEN, JR.  
GEO. C. MOORE.

Witnesses:

GEORGE M. JOHNSON,  
EDMUND H. SAWYER.