

(Specimens.)

W. LAPWORTH.
ELASTIC OR CORDED FABRIC.

No. 440,743.

Patented Nov. 18, 1890.

Fig. 1.

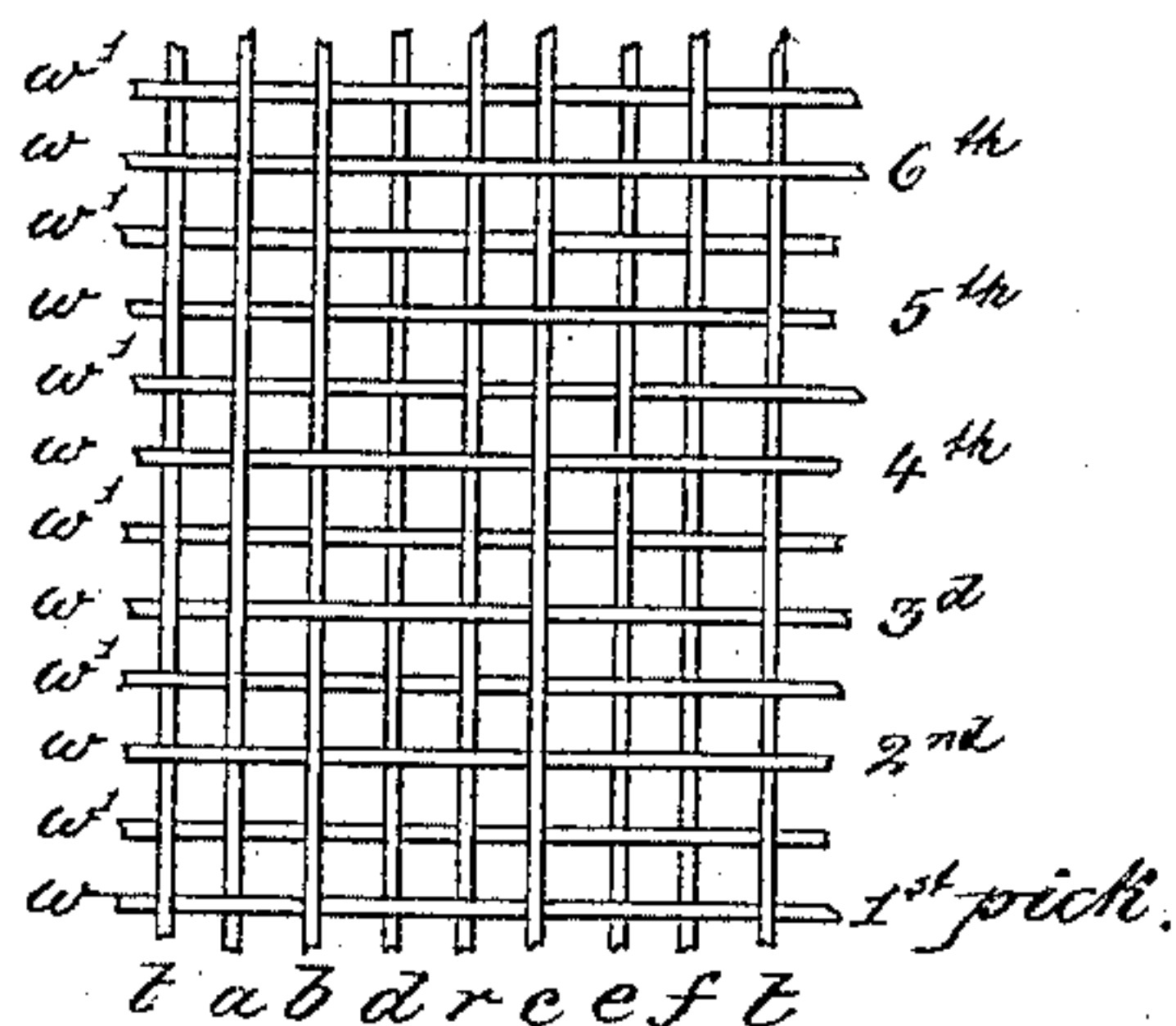


Fig. 2.

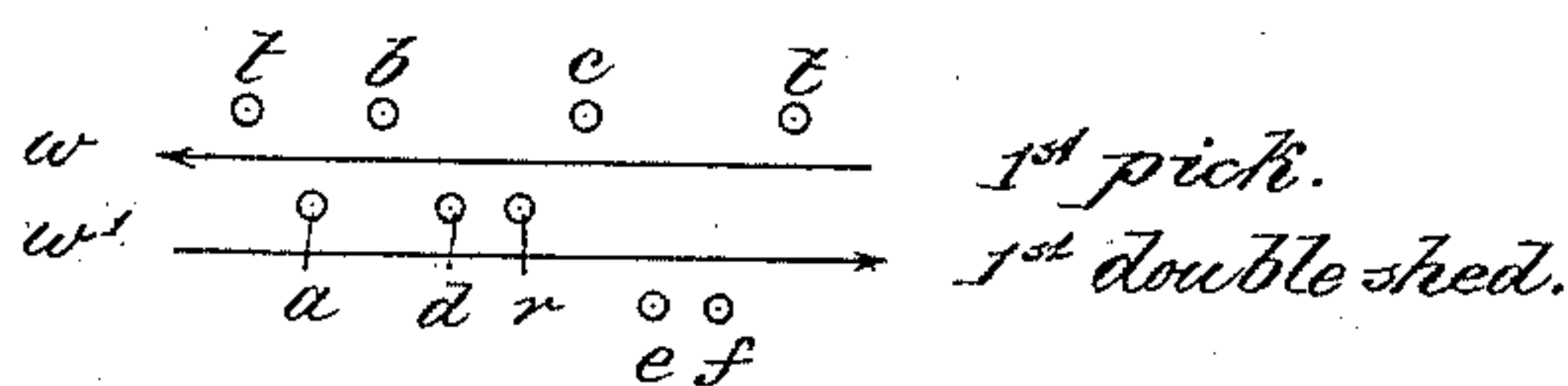


Fig. 3.

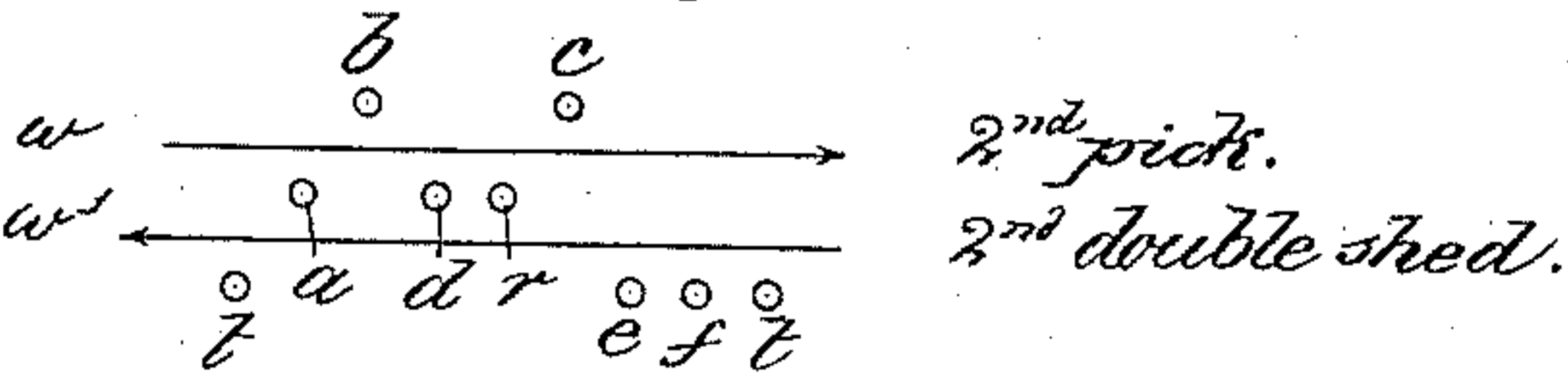


Fig. 4.

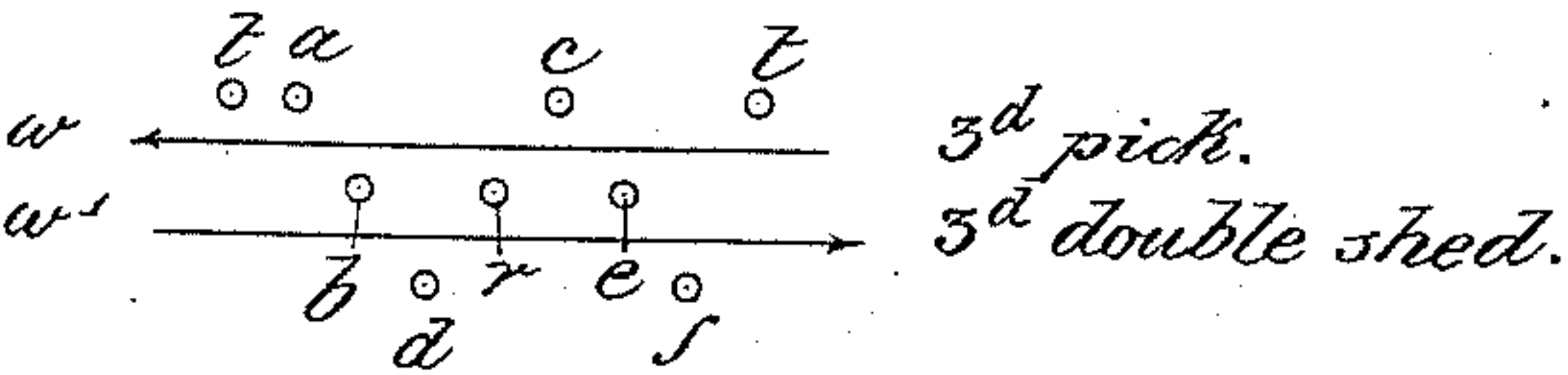


Fig. 5.

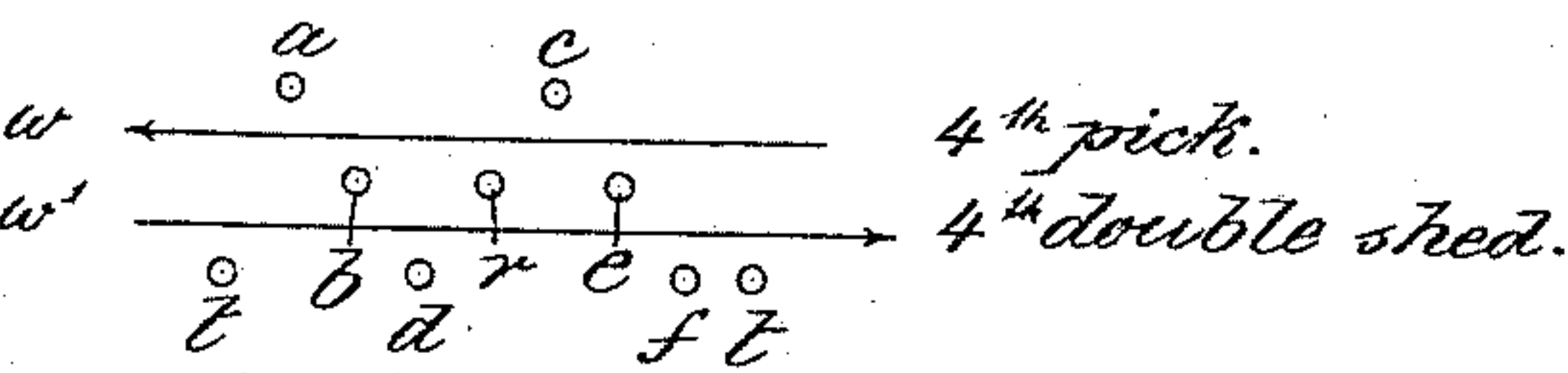


Fig. 6.

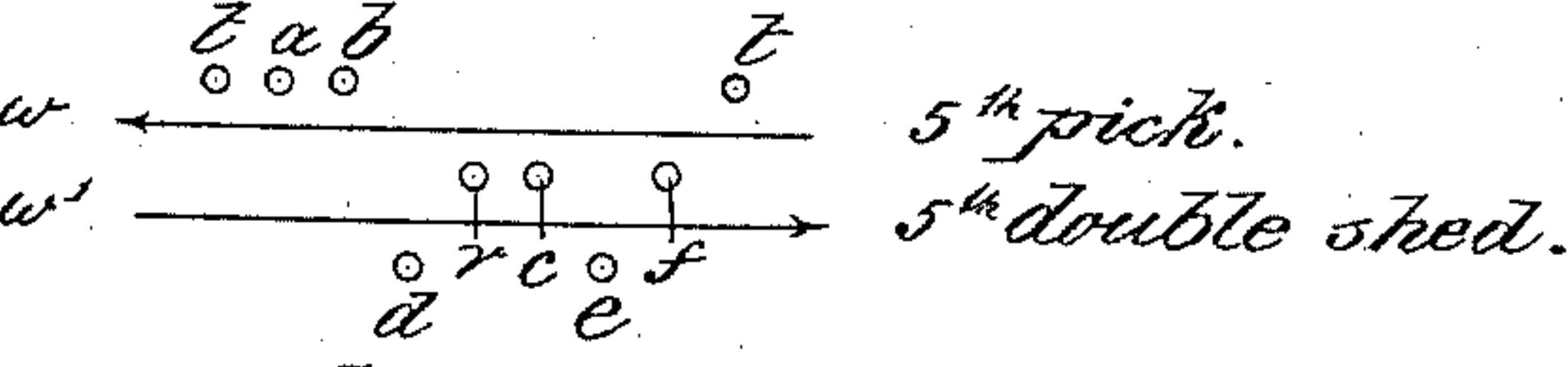
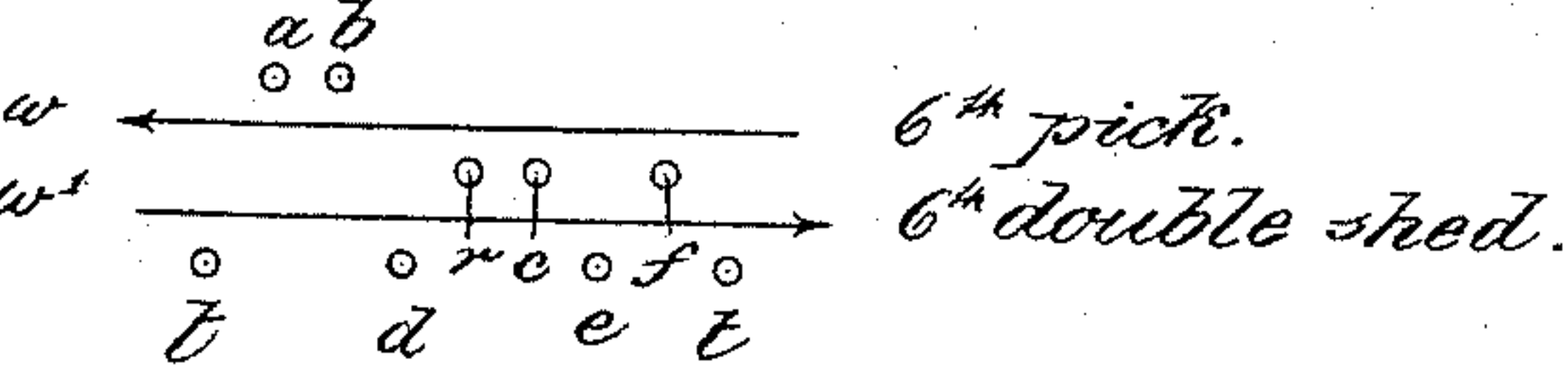


Fig. 7.



Witnesses.

Arthur Giffordson.

John F. C. Printz

Inventor.

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by Crosby & Gregory Attys

UNITED STATES PATENT OFFICE.

WILLIAM LAPWORTH, OF EAST HAMPTON, ASSIGNOR TO THE HOPEDALE
ELASTIC FABRIC COMPANY, OF HOPEDALE, MASSACHUSETTS.

ELASTIC OR CORDED FABRIC.

SPECIFICATION forming part of Letters Patent No. 440,743, dated November 18, 1890.

Application filed April 30, 1886. Serial No. 200,635. (Specimens.)

To all whom it may concern:

Be it known that I, WILLIAM LAPWORTH, a subject of the Queen of Great Britain, formerly residing at East Hampton, county of Hampshire, and State of Massachusetts, but now a resident of Hopedale, Worcester county, Massachusetts, have invented an Improvement in Elastic or Corded Fabric, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In another application, Serial No. 184,556, filed by me on the 3d day of December, 1885, I have described a single fabric having a twilled face and plain back of the same color, the fabric being woven as a six-time motion with a single shuttle.

Double fabric or fabrics above and below rubber or cord warps, cord warps being used instead of rubber warps when it is desired to make a corded fabric instead of an elastic one and united by binder-warps, are old; but in all such fabrics known to me having a twilled face and back the order of shedding has never been such as herein provided for, but has usually been two up and one down.

In the manufacture of a fabric wherein the warp-threads are shed to remain up for two picks and down for one pick the twill is not elevated or made prominent, and the very frequent changing of the warps in the shed subjects them to wear and abrasion. To provide a fabric with a more prominent twill and to also increase the durability of the fabric and its thickness, and at the same time make a more salable and desirable fabric, I preferably mount the india-rubber or cord warp so that it remains stationary, and then I cause the sheds to be made in such order that each warp-thread at the face of the fabric will float or stand up in succession for four picks and then down or be concealed in the fabric for two picks as far as the rubber or cord warp, which latter remains stationary between the two shuttles, the back warp-threads being down or floated at the back of the fabric in succession for four picks and being raised as far as the rubber or cord warp, when it is concealed, the sheds so formed

at one side of the rubber warp between the face threads and binder-warps and at the other side thereof between the back threads and binder-warp threads, receiving each a weft-thread of the color desired to correspond or to co-operate with the color of the face and of the back threads, thus giving to the face and back of the fabric the desired color, the face and back plies so formed being united by binder-warps.

The single fabric described in my application, Serial No. 184,556, filed December 3, 1885, has a face such as herein described, and the time is the same; and I do not, therefore, herein claim anything shown in the said application.

Figure 1 is a face view of a fabric embodying my invention, the threads being separated to better show their crossings. Fig. 2 is a cross-section of a part of the fabric at the first shed, the horizontal lines showing the weft-thread; and Figs. 3 to 7 are like sections, showing the sheds from the second to the sixth, the latter completing the pattern, the next shed being a repeat of the first shed.

My improved fabric, as herein shown, is produced by three sets of face warp-threads, each in different harness-frames; three sets of back warp-threads, each set in its own harness-frame; a set of india-rubber or cord warps in a seventh harness-frame, and a set of binder warp-threads in an eighth harness-frame, each frame having heddles of usual construction, the said frames, except the one having the rubber warps, being moved in any manner commonly practiced in looms for weaving elastic fabrics. The weft will be introduced by two shuttles moved in opposite directions at the same time, one, however, passing through the shed formed between the face warp-threads and binder-warp threads at one side the rubber warp, the other weft-thread passing through the shed formed between the back warp-threads and the binder-warp threads at the other side of the india-rubber or cord warp, the binder-warp threads forming part of the threads in both the said sheds. The face warp-threads are marked *a b c*, the back warp-threads *d e f*, the rubber or cord warps *r*, and the binder-warp threads *t*. All

the warp-threads designated by like letters are carried by the heddles of one harness-frame.

The harness-frame containing the rubber or cord warp will preferably be left stationary, as provided for in patent to William Smith, No. 9,653, which shows a two-shuttle loom.

Herein I have provided for eight threads in each reed-space; but I do not limit my invention to such number.

In the first shed, (see Fig. 2,) which, it will be understood, is a double shed, the face warp-thread *a* is lowered to the rubber warp *r*, the back warp *d* is raised to the rubber, and the binder *t* is carried to the top through both sheds, leaving the face warp-threads *b c* up or floating at the face, and the back warp-threads *e f* down or floating at the back of the fabric. In this condition each weft or filling thread *w w'* is passed through the sheds in the direction shown by the arrow; but just before the said shuttles are to return to make the second pick the binder-warp thread *t* is lowered to the level of the back warp-threads *e f* to constitute the second shed, as in Fig. 3.

For the third shed the face warp-threads *a c* are left up or to float, the thread *b* is brought down to the rubber, the back warp-threads *d* and *f* are left down, so as to float on the back, and the thread *e* is lifted to the rubber, the binder being carried up through both sheds. The shuttle-threads *w w'* are passed through the double sheds so formed, and for the fourth shed the only change is that the binder-warp threads *t* are again permitted to descend and the fourth pick is made.

For the fifth shed of the face warp-threads only those marked *c* are lowered to the rubber warp, and of the back threads only those marked *f* are raised to the rubber warps, the binder-warp threads *t* being carried up through both sheds, as at the third pick.

For the sixth pick the binder-warp threads are again carried down through both sheds, as at the second and fourth picks. In this way the face warp-threads are held up or float for four picks and then go down or are concealed for two picks, and the back warp-threads are kept down or floated at the back of the fabric for four picks and up for two picks, the binder-warp threads being raised and lowered at alternate picks, the latter threads uniting what otherwise would be two inde-

pendent plies of fabric, the two plies being bound together at the sides of the rubber or cord warps.

It will be apparent that two-thirds of the stock of the face warps are on the face or outer side of the face ply of the fabric, and that two-thirds of the stock of the back warps are on the back or outer side of the back ply of the fabrics, and that the two plies of the fabric are bound together at each pick by the binders, the latter being changed at every pick, while only one-third of the face and back warps are changed at each alternate pick only, the rubber warps remaining stationary in the middle of the fabric. This disposition of the warp-thread, in connection with the weft-threads and the rubber warps, produces a two-ply fabric, between the two plies of which the rubber warps are strongly bound, so that they cannot slip in the tubes in which they are incased, the fabric presenting at face and back a well-defined twill, and both outer sides having so much stock as to give great durability for a given amount of stock, thus producing a very desirable and salable fabric and one which may be of different colors on its opposite sides.

I claim—

The herein-described two-ply elastic or corded fabric, consisting of face and back warps, rubber or cord warps, binder-warps, and face and back filling or weft threads, the face warps floating in succession over the face weft for four picks and passing below said weft, but above the back weft, for two picks, the back warps passing outside of or below the back weft for four picks and above said back weft, but below the face weft, for two picks, the rubber or cord warps remaining stationary at all times between the two plies of the fabric, and the binder-warps passing alternately above and below the face and back wefts at each pick, the binders being thus changed with the wefts at each pick, and one-third of the face and back warps being changed with the wefts at each alternate pick only, substantially as set forth.

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

WILLIAM LAPWORTH.

Witnesses:

G. W. GREGORY,
C. M. CONE.