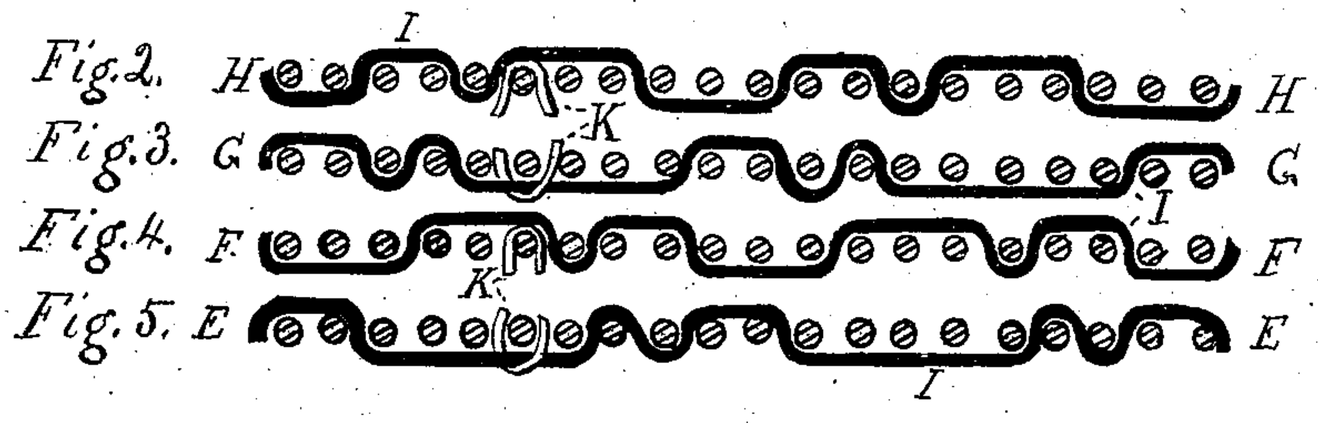
J. O. FRYER.

Suspender Strap Webbing.

No. 230,122. Patented July 20, 1880.



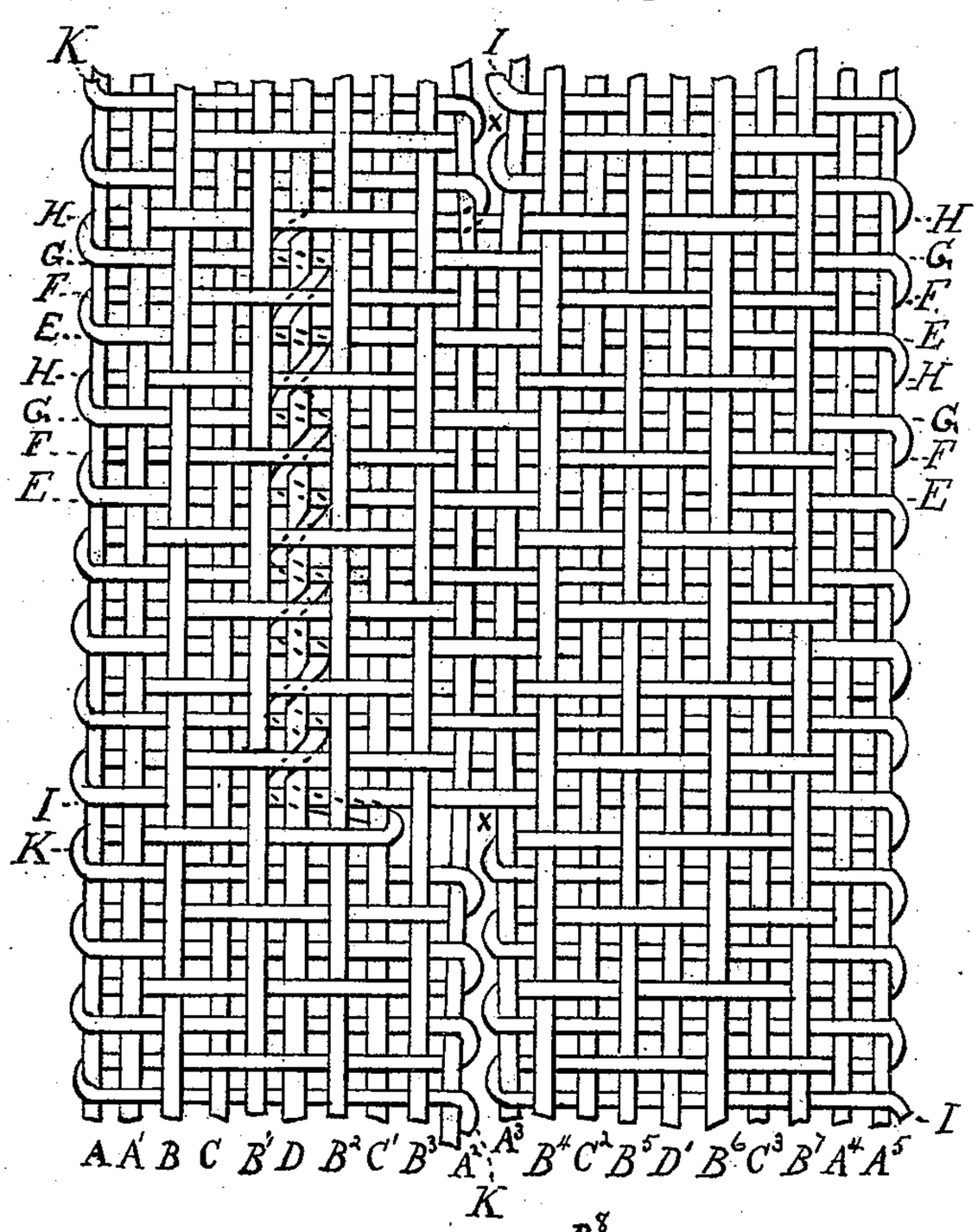


Fig. 1.

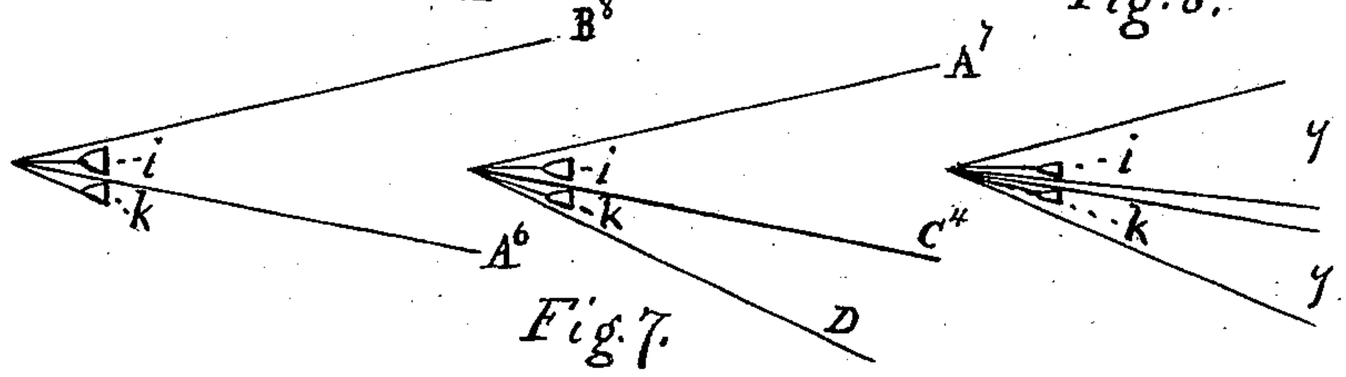


Fig. 6. Fig. 7. Fig. 8.

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UNITED STATES PATENT OFFICE.

JOHN O. FRYER, OF LOWELL, MASSACHUSETTS.

SUSPENDER-STRAP WEBBING.

SPECIFICATION forming part of Letters Patent No. 230,122, dated July 20, 1880.

Application filed April 8, 1879.

To all whom it may concern:

Be it known that I, JOHN O. FRYER, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a new and useful Improvement in Suspender-Strap Webbing, of which the following is a specification.

My invention relates to that class of narrow webbing used for suspender-straps and provided with woven button-holes; and it consists in weaving into the fabric, between the button-holes, what is commonly known as the "floating filling."

In the accompanying drawings, Figure 1 is an enlarged view of the face of a very narrow suspender-strap webbing, woven very loosely to show all the threads of the fabric, such webbing being usually about six times as wide—that is, having about six times as many warp-threads—as that herein shown, the part of the figure to the right of the two threads in the middle of the figure being five times repeated on the right of the figure, and the part to the left of said two threads being five times repeated on the left of the figure, omitting in the latter case, of course, the representation of the filling of the lower shuttle between the button-holes. The fabric in Fig. 1 is supposed to be woven from bottom to top.

Figs. 2, 3, 4, and 5 are cross-sections at the points marked H H, G G, F F, and E E, respectively, in Fig. 1, and represent the lower ends of the upper part of the fabric separated at those points, the solid black lines showing the course taken by the filling of the upper shuttle in four successive picks between the button-holes, the circles being the ends of the same warp-threads shown immediately below said circles, respectively, in Fig. 1, and the loops K representing the filling of the lower shuttle, the shuttles being supposed to move to the right in Figs. 2 and 4 and to the left in Figs. 3 and 5, the warp-threads above the filling of the upper shuttle forming the upper half of the shed, and vice versa, in all of said Figs. 2, 3, 4, and 5, and the filling of the lower shuttle passing above the single warp-thread in Figs. 2 and 4, and below all the warp-threads in Figs. 3 and 5, as hereinafter described.

In Figs. 6, 7, and 8 the warp-threads are turned at right angles to those in Figs. 2, 3, 4, and 5.

In Fig. 6, B^8 and A^6 represent the upper and lower halves, respectively, of the single shed used in weaving the parts of the fabric shown in Figs. 3 and 5, the shuttles *i k* being supposed to be moving away from the observer.

In Fig. 7, A^7 is the upper, and C^4 is the lower, half of the shed used in weaving the part of the fabric shown in Figs. 2 and 4, the shuttles *i k* moving toward the observer, the single warp-thread D being below the lower shuttle, *k*.

Fig. 8 represents the position of the two sheds *y y* and the two shuttles when the button-holes *x x* are being woven and the shuttles are moving either from or toward the observer.

A A′ A^2 A^3 A^4 A^5 are binders appearing on both surfaces of the fabric. B B′ B^2 B^3 B^4 B^5 B^6 B^7 are face-threads. (Shown only on the face of the fabric.) C C′ C^2 C^3 are back threads. (Shown only on the back of the fabric.) D D′ are center-threads, and are not shown on the face or back of the fabric. I is the filling of the upper shuttle, *i*, and K is the filling of the lower shuttle, *k*.

Usually, in weaving ordinary plain or unfigured suspender-strap webbing (meaning webbing that is colored on the face and white on the back) with button-holes, the webbing between the button-holes is woven substantially as other narrow fabrics are made, the loom having twelve harnesses which move in sixes to form the button-holes, but having for each web two shuttles, one placed below the other, and the lower shuttle running below the shed, as in Fig. 6.

At the place where it is desired to make a button-hole two sheds are formed, one below the other, as in Fig. 8, and the strap or webbing on one side of the button-hole is woven by one shuttle and the strap on the other side of the button-hole by the other shuttle—that is to say, the web is divided into two parts, each of half the width of the web between the button-holes, for a distance as long as the proposed button-hole, and when that distance is completed the two sheds become one again, and only one web is woven until it is necessary to make a new button-hole. The

filling of the lower shuttle is not incorporated into the web between the button-holes, but floats or runs outside of the fabric from one button-hole to the next all along the reverse side of the fabric. This floating filling must be picked off before the webbing is made into suspender-straps, at an expense to the manufacturer of the webbing or to the manufacturer of suspenders of about two dollars for a week's product of a loom of twenty-four double shuttles. The threads thus picked off are wasted, being too short for weaving, of course, and worthless for any other purpose. To avoid the expense of picking off this floating filling, and at the same time to make this filling useful, I use a single additional harness, which carries one warp-thread (the center thread, D, for instance) between the button-holes, beside lifting its warp to the top of the shed, and also carries said warp so low that the lower shuttle passes between it and the bottom of the upper or main shed. When this single warp is raised it carries a loop of the filling of the lower shuttle to the top of the shed, and when next the upper shuttle is shot across it passes between said single warp and the lower filling. When the single warp goes down the lower shuttle is moved to one side of it, and when said single warp goes up the lower shuttle is carried to the other side of it, so that the filling carried by the said lower shuttle is twisted once around the said single warp every time such shuttle passes through its race and back again. The upper filling-thread passes between the single warp and the lower filling every time that the latter twists once around said single warp.

The above description of my method, of course, supposes the single warp-thread to be taken from a harness which rises at one pick and falls at the next, and also supposes the lower filling to wind once around the single warp in two picks; but it may be made to wind once around the single warp only once in four picks, or even less frequently. If once in four picks, the single warp would fall low enough to take in the lower filling only once in four picks—that is, in the fourth pick—while in the second pick it would fall only below the upper shuttle, and in the first and third picks it would rise above the upper shuttle; but in any case, if the single warp taken be the center thread, D, the number of picks in which the lower filling passes around the single warp once must be an even number, because the center thread, D, to preserve the figure of the fabric, must rise at one pick and fall at the next. (See Fig. 1.) Said single warp-thread might be taken from a spool caused to rise and fall as a harness does.

In the way above described the filling of the lower shuttle adds strength to the fabric between the button-holes, instead of being a nuisance to be removed at considerable expense.

I claim as my invention—

1. The strap-webbing, constructed as above set forth, having woven button-holes and having the additional weft-thread woven into the body of the fabric between said button-holes, as and for the purpose specified.

2. Suspender-strap webbing having woven button-holes, in which webbing both filling-threads are woven into the fabric between the button-holes, as and for the purpose herein specified.

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