F. H. STEWART.

WOVEN FABRIC.

APPLICATION FILED AUG. 21, 1920.

1,368,215.

Patented Feb. 8, 1921.

2 SHEETS—SHEET 1.

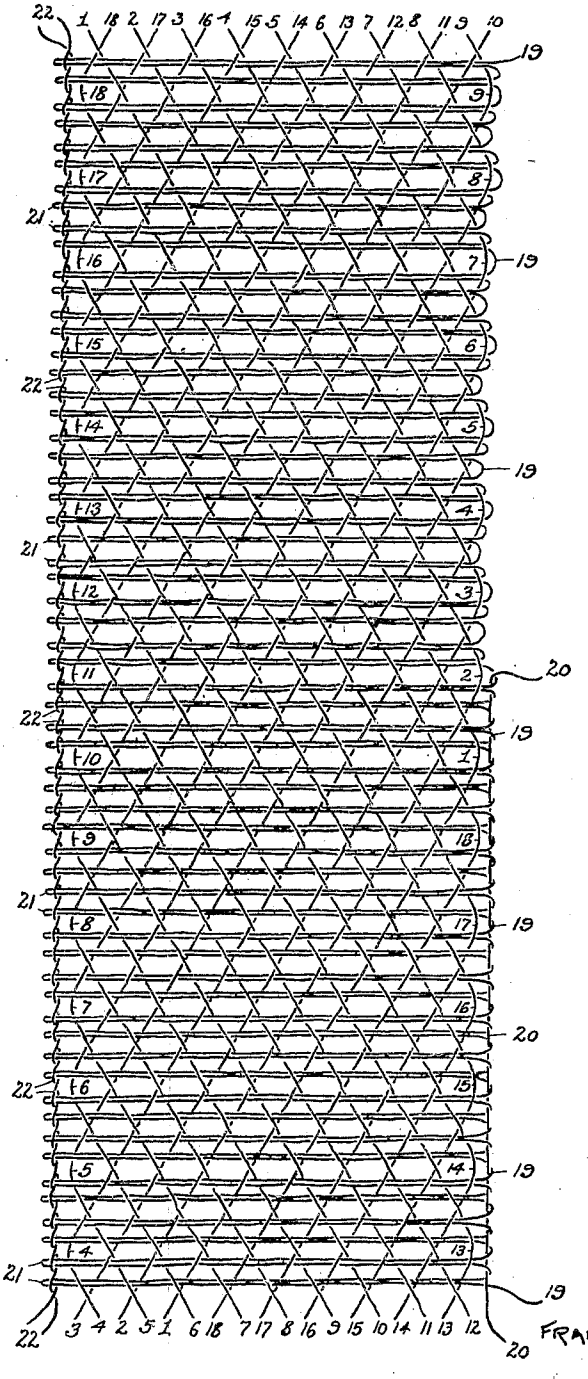


Fig. 1.

INVENTOR
FRANK H. STEWART

BY HIS ATTORNEY Harry Smith

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2 SHEETS—SHEET 2.

Fig. 2.

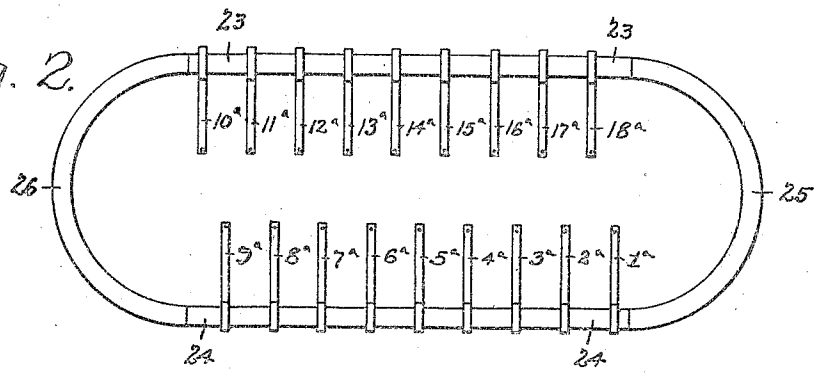


Fig. 3.

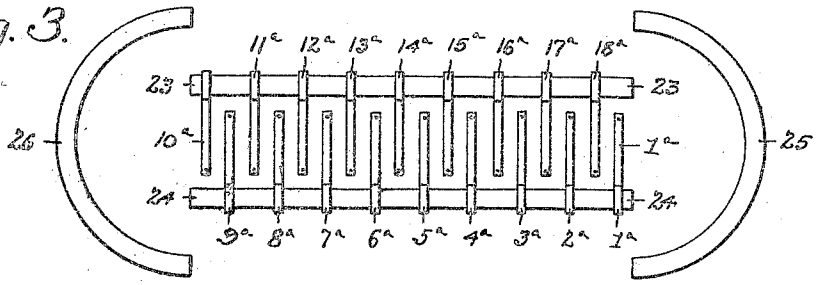


Fig. 4.

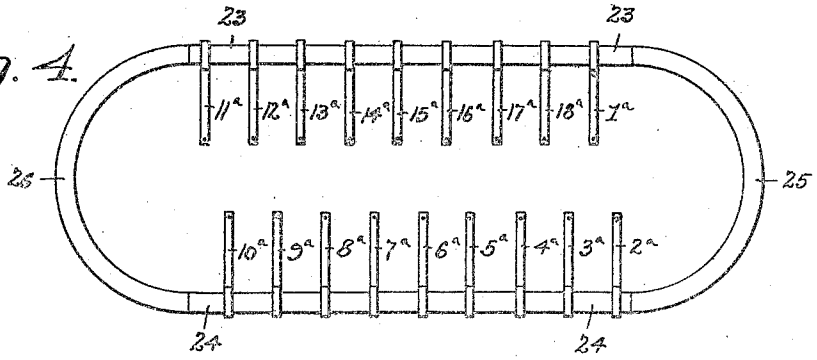
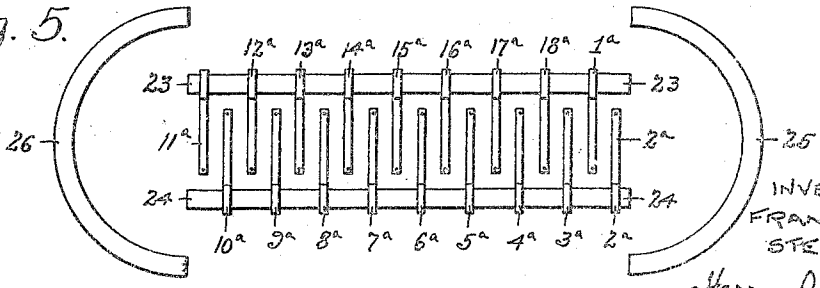


Fig. 5.



INVENTOR
FRANK H.
STEWART

BY HIS ATTORNEY Harry Smith

UNITED STATES PATENT OFFICE.

FRANK H. STEWART, OF ELKINS PARK, PENNSYLVANIA.

WOVEN FABRIC.

1,368,215. Specification of Letters Patent. Patented Feb. 8, 1921.

Application filed August 21, 1920. Serial No. 405,121.

To all whom it may concern:

Be it known that I, FRANK H. STEWART, a citizen of the United States, residing in Elkins Park, Pennsylvania, have invented certain Improvements in Woven Fabrics, of which the following is a specification.

My invention relates to woven fabrics and has as its object the production of a fabric which will possess all the advantages of a woven fabric cut on the bias but will not be possessed of any of the disadvantages thereof. This object I accomplish by weaving a fabric in which the wefts are transverse of the length of the fabric and the warps are reversely diagonal. That is to say, each warp, in addition to traversing the fabric from end to end, traverses it progressively to and fro from side to side, so that at any given point in the length of the fabric, one half of the warps will be traversing not only forwardly but toward one edge of the fabric while the other half of the warps will be traversing not only forwardly but toward the other edge of the fabric. Such a fabric not only is susceptible of the diagonal distortion which is the outstanding feature of a piece of fabric cut on the bias, but being properly selvaged in the weaving, will not pull or fray at the edges.

In the accompanying drawing Figure 1 is a face view, on an exaggerated scale and of a diagrammatic nature, of a piece of fabric woven in accordance with my invention, and Figs. 2 to 5, inclusive, are diagrammatic face views illustrating a succession of heddle adjustment during the weaving of the fabric illustrated in Fig. 1.

The fabric illustrated comprises eighteen warp threads which are numbered, respectively, 1 to 18. With these warps are interwoven wefts which are preferably, though not necessarily, formed from a continuous weft forming thread 19 which passes, in a to-and-fro run through each of the successive sheds of the warps. In the fabric illustrated, the nine warp threads traversing from left to right each cross, transversely, one of the nine warp threads traversing from right to left, between each pair of to-and-fro runs of the weft forming thread 19, and between the to-and-fro runs of each pair of the same the warp threads are shedded without change in their previous lateral relation.

The weft forming thread 19 will, as it passes from one to-and-fro run to the next, form a selvage, as illustrated at the right hand edge of the upper half of the fabric shown in Fig. 1, but, if desired, this edge may be strengthened and rendered neater by the provision of a longitudinal selvage warp thread 20, as illustrated at the right hand edge of the lower half of the fabric shown in said figure. The provision or omission of this selvage warp thread 20 is entirely optional and in no way affects the essential feature of my invention.

The outer ends of each to-and-fro run of the weft forming thread 19 are united by a loop 21 and these loops may, if desired, be engaged by any suitably arranged loop locking thread or threads, for the purpose of preventing them being drawn back into the body of the fabric. In the fabric illustrated the loops are shown as engaged and retained by a pair of longitudinally disposed twisted loop locking threads 22 arranged as shown and described in my United States Letters Patent No. 1,324,627, dated December 9, 1919. This arrangement, however, is also optional.

In Figs. 2 to 5 inclusive, are shown four of the successive heddle adjustments during the weaving of the fabric shown in Fig. 1. Each of the warp threads 1 to 18 is controlled by one of corresponding heddles 1^a to 18^a, and these heddles are slidably mounted upon upper and lower controlling bars 23 and 24. When in a certain position, as shown in Figs. 2 and 4, the ends of these controlling bars are alined with the ends of a pair of semi-circular guide bars 25 and 26 upon which the heddles may also slide.

In operation, the bars 23 and 24 will be moved away from one another, as shown in Fig. 2, whereupon a shed will be formed by the warp threads, the warp threads 1 to 9 controlled, respectively, by the heddles 1^a to 9^a forming the lower member of the shed and the warp threads 10 to 18 controlled, respectively, by the heddles 10^a to 18^a forming the upper member of the shed. A to-and-fro run or weft forming thread is inserted in this shed after which the next shed is formed by moving the bars 23 and 24 toward one another to the position shown in Fig. 3, whereupon the warp threads 1 to 8 will be carried by the heddles 1^a to 8^a to form the upper member of the shed and the warp threads 10 to 18 will be carried by the heddles 10^a to 18^a to form the lower member of the shed. A

to-and-fro run of weft forming thread is inserted in this shed, and the next shed is then formed by moving the bars 23 and 24 away from one another and positioning the heddles thereupon as shown in Fig. 4. To accomplish this each of the heddles 2^a to 9^a is moved on the bar 24 one step to the right while the heddle 1^a is moved from the bar 24 over the semi-circular guide bar 25 to the right hand end of the bar 23, and, at the same time, each of the heddles 11^a to 18^a is moved on the bar 23 one step to the left while the heddle 10^a is moved from the bar 23 over the semi-circular guide bar 24 to the left hand end of the bar 24. With the heddles in this position a to-and-fro run of weft forming thread is inserted in the shed and the next shed is formed by moving the bars 23 and 24 toward one another to the position shown in Fig. 5. A to-and-fro run of weft forming thread is inserted in this shed and the next shed is formed by another repositioning of heddles similar to that already described. In this repositioning the heddle 2^a is moved up from the bar 24 to the bar 23 and the heddle 11^a is moved down from the bar 23 to the bar 24 and the remaining heddles each receive the proper lateral movement upon their bars.

This process continues until each heddle has performed a complete cycle, after which the cycle repeats itself.

In Figs. 2 to 5, which are purely diagrammatic and explanatory merely of a method of controlling the warp threads to produce their peculiar disposition in the fabric, no attempt has been made at either mechanical accuracy or detail.

It is, of course, to be understood, that, although I show the wefts as formed of a succession of to-and-fro runs of a continuous thread, my invention is not limited in this manner, and even though the to-and-fro run is adhered to, a plurality of weft-forming threads may be employed, their runs being inserted, in serial order, from either or both edges of the fabric. Such modifications, being obvious, require no special illustration.

The primary feature of my invention resides in the reversely diagonally disposed warp threads with transverse wefts interwoven therewith, the other attendant and coöperating features shown and described being subordinate.

I claim:

1. A woven fabric comprising reversely diagonal warp threads and a continuous weft forming thread passing to and fro in successive sheds of the warp threads to form wefts.

2. A woven fabric comprising a set of reversely diagonal warp threads, a longitudinal selvage warp thread flanking the same, and a continuous weft forming thread passing to-and-fro in successive sheds of the diagonal warp threads to form wefts and being looped about said selvage warp thread between adjacent to-and-fro runs.

3. A woven fabric comprising a set of reversely diagonal warp threads, a continuous weft forming thread passing to and fro in successive sheds of the warp threads to form wefts and having loops at the ends of the to-and-fro runs, and longitudinally disposed loop locking threads flanking said set of warp threads and engaging and retaining said loops.

In testimony whereof, I have signed my name to this specification.

FRANK H. STEWART.