No. 652,060. Patented June 19, 1900.

P. A. WAGNER.

LOOM HARNESS.

(Application filed Sept. 28, 1899.)

(No Model.)

Fig. 3.

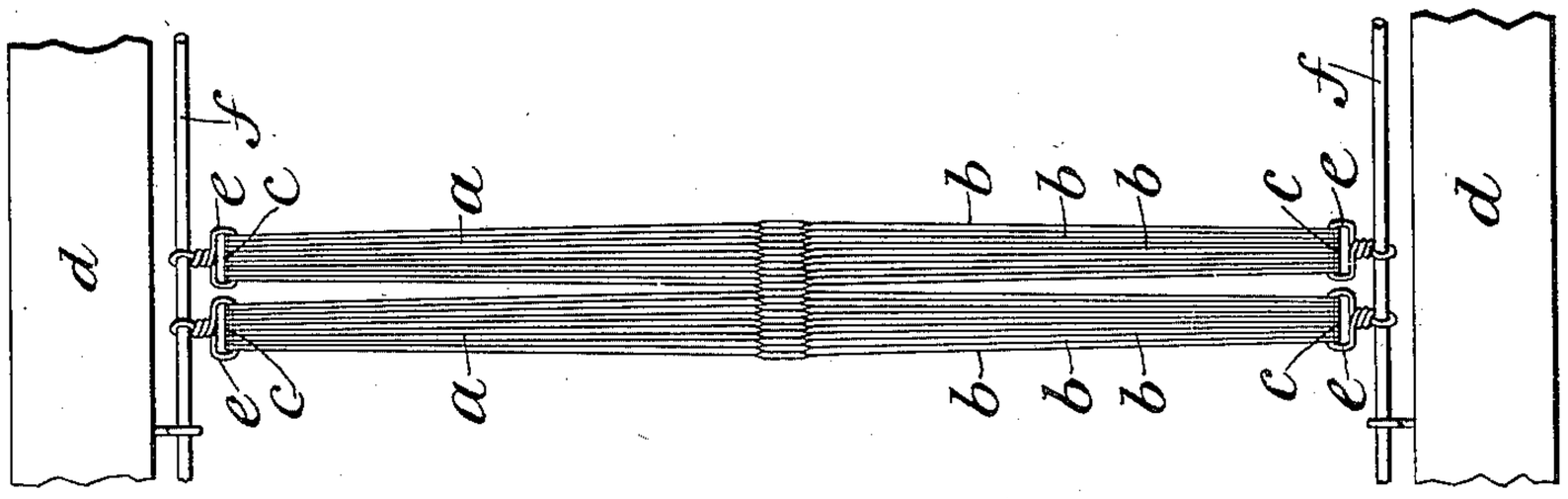


Fig. 2.

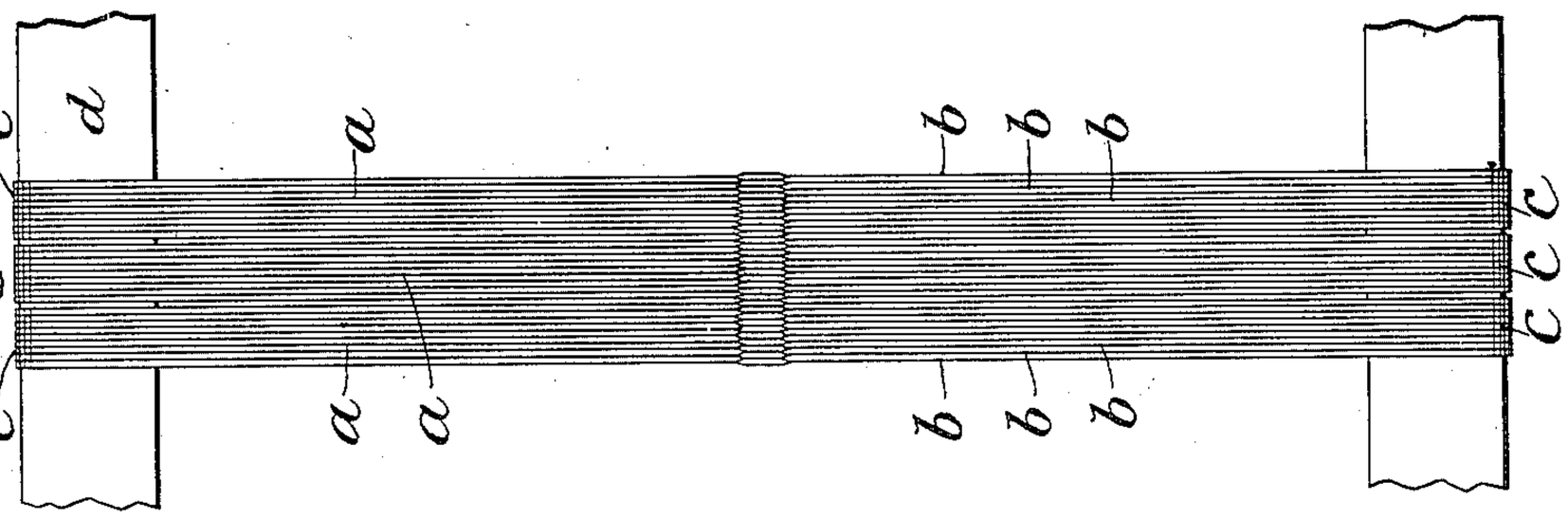
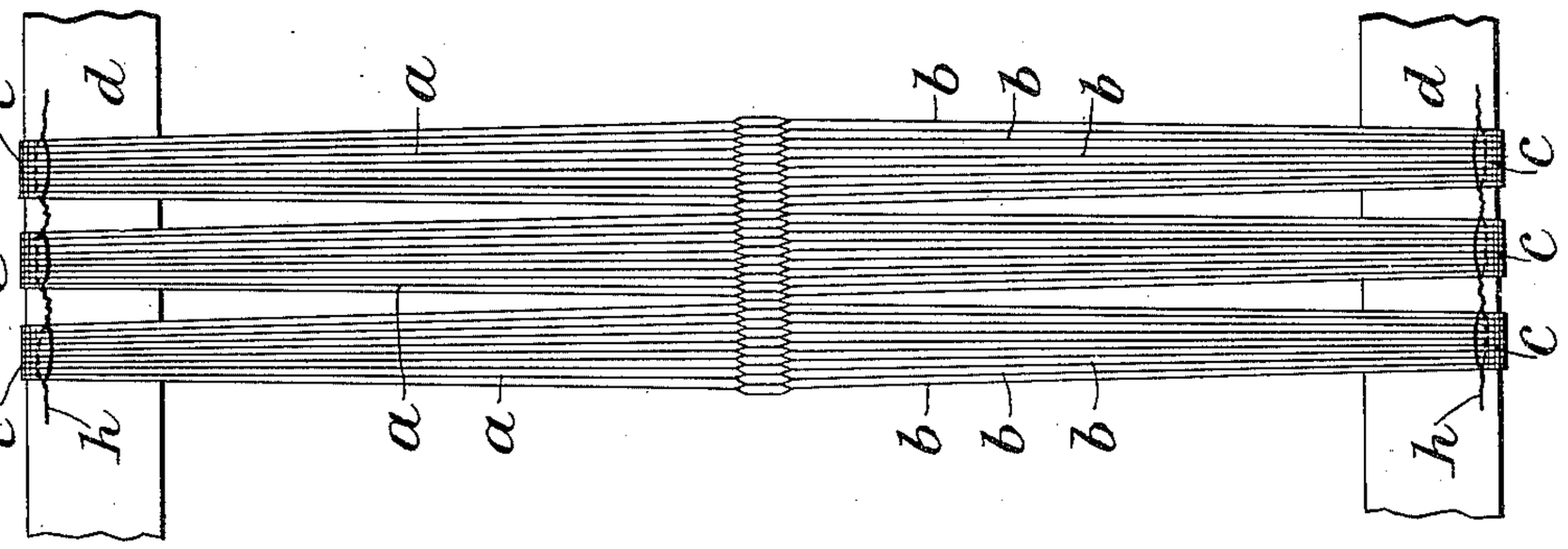


Fig. 1.



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LOOM-HARNESS.

SPECIFICATION forming part of Letters Patent No. 652,060, dated June 19, 1900.

Application filed September 28, 1899. Serial No. 731,895. (No model.)

To all whom it may concern:

Be it known that I, PAUL A. WAGNER, residing in Carlstadt, Bergen county, State of New Jersey, have invented certain new and useful Improvements in Loom-Harness, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

Harnesses for looms of the variety known as "thread harnesses" are now commonly made in continuous widths—that is to say, the leashes or heddles, which are independent of each other for the greater portion of their length, at their ends are united or woven together—the width of the harness being determined by the width of the fabric to be woven. On account of the danger of tangling when not in use the heddles of this class of harness cannot be strung singly upon the shafts of the heddle-frame. Wire harness has been frequently made up of wires which are strung singly upon the shafts and are independently adjustable thereon; but wire harness cannot be used for the class of work in which thread harness is employed.

This invention relates to thread harness, and has for its object to overcome certain difficulties which are incident to the manufacture and use of thread harness which is made in continuous widths. In order that the invention may be the more readily understood, some of the difficulties alluded to will be pointed out.

The difficulty which the manufacturer of loom-harnesses meets is that as a continuous-width harness is adapted only for a particular width and kind of fabric he must run his shop on special orders. The result is that at times he is overrun with orders and at other times he must stop his machines altogether. On the other hand, the weaver must incur the expense of a new harness with every change of the goods he is making. Thus if he wishes to weave a fabric twenty-eight inches wide with fifty threads to the inch he must have a special harness. If he wishes to weave a twenty-eight-inch fabric with sixty threads to the inch, he must have another harness. So, too, if he desires to weave a thirty-inch fabric with fifty threads to the inch. Again, if he lays a harness aside and after some time desires to use it again he frequently finds that a number of consecutive leashes have become rotten, with the result that the whole harness is ruined and must be replaced by a new one.

This invention consists in the improved thread harness, all as hereinafter more particularly described, whereby it is sought to overcome the difficulties above noted.

In the accompanying drawings, Figure 1 shows a harness made in accordance with my invention and adapted for the weaving of a fabric of a given width with a certain number of threads to the inch, and Fig. 2 shows the harness adapted for the weaving of a fabric with a greater number of threads to the inch. In both figures the coarseness of the harness is greatly exaggerated in order to make the illustration clearer. Fig. 3 represents a special form of the improved harness.

As will be seen by reference to the drawings, the improved harness instead of being made in one continuous width is composed of a plurality of groups *a a* of heddles or leashes. Each group consists of a determinate number of heddles or leashes *b b*, which are inseparably united at their ends, as at *c c*, while each group is adjustable independently of all the others upon the shafts *d d* of the heddle-frame. In the manufacture of the harness the heddles or leashes are formed and united into groups which contain a determinate and equal number of heddles, a plurality of these groups are then strung upon the shafts of the heddle-frame, and, finally, the groups are equally distributed upon the shafts. The heddles may be made first and subsequently united, or they may be united as they are made, the exact means for securing the several heddles of each group together being immaterial. The number of heddles in each group may be varied to suit the convenience of the manufacturer or of the weaver. It has been found, for example, that ten heddles to a group is a convenient number.

The advantage to the harness-maker which results from the above-described method of making harnesses is that he can run his harness-machines as he wishes, keeping always on hand a sufficient stock of groups of heddles to fill orders as they come in. Then when an order for a special harness is received he has only to select the proper number of groups

to give him the required number of heddles in the total width of the harness and to slip them on the shafts of the heddle-frame, disposing them evenly and securing each group to the shafts in any convenient manner. If the weaver, on the other hand, prefers to arrange his harness for himself, he has only to add to or remove from the heddle-frame as many groups as may be necessary to dispose properly the whole number of groups which he then has upon the shaft. Thus, assuming that he has been using a harness of a given width with fifty threads to the inch, which may be represented by Fig. 1, and desires a harness of the same width, but of sixty threads to the inch, which may be represented by Fig. 2, he will slip upon the shafts one additional group of heddles for every inch in width and will arrange the groups one for every one-sixth of an inch of the harness-shaft instead of one group for every one-fifth of an inch, as before. If he desires a wider harness, he has only to add the requisite number of groups. If a change is to be made from a fine fabric to a coarser one—that is, to one having fewer threads to the inch—it would be impossible to use a continuous-width harness, even by spreading the heddles, for the following reason: It being necessary to take the required number of heddles in succession—say five hundred heddles for a ten-inch fifty-thread fabric—the said five hundred heddles would have to be spread over a width of ten inches instead of the width of eight and one-third inches, which they normally occupied in the sixty-thread harness. This would necessitate the eye of the first and five-hundredth heddle being moved five-sixths of an inch, respectively, to the right and left, which would of course be impossible. If, however, the harness is made up of groups each independently adjustable, the groups will be distributed evenly over the ten inches, one group for every one-fifth of an inch. The first and tenth threads of each group will then have to be moved, respectively, to the right and left only one-sixtieth of an inch, which movement will be effected readily by the warps themselves.

If at any time a group of heddles is rotted or broken in any way, it may be removed at once and a new group added to the shafts without permitting the whole harness to be ruined or requiring it to be patched up. It is also evident that the work of the weaver in threading his harness will be facilitated by reason of the fact that the harness is divided into equal groups.

As shown in Fig. 3, it is desirable on some accounts to unite the several heddles of a group to a single eye, as at *e*, which alone receives the shaft and supports the entire group. With harness of this form it is preferred to employ a frame having a wire shaft, as at *f*, which is suitably supported by the cross-bar *d* of the heddle-frame. This arrangement facilitates the adjustment of the harness by the warp itself. Thus it often happens that the loom-fixer does not set the harness in its proper position with respect to the line of the warp, but a little to one side or the other. With a harness of the usual description this results in a constant lateral strain of the warps and heddles, with a consequent wear upon both. When, however, the harness is composed of a number of groups of heddles, each group being independently adjustable upon the shafts, and particularly when each group is supported by a single eye which can move freely upon a smooth shaft, the warps themselves will quickly effect a readjustment of the heddles, each group of warps shifting the corresponding group of heddles this way or that until it is exactly in its proper position. In order to prevent an excessive displacement of any group, the several groups may be loosely connected by a thread, as at *h*, which runs from one group to another.

I claim as my invention—

1. A loom-harness composed of a plurality of groups of heddles, each group containing a determinate number of heddles, the heddles of each group being united at their ends, and each group being adjustable independently of the rest upon the shafts of the heddle-frame.

2. A loom-harness composed of a plurality of groups of heddles, each group containing a determinate number of heddles, the heddles of each group being united at their ends, and each group being adjustable independently of the rest upon the shafts of the heddle-frame, the several groups being loosely connected by a thread to prevent excessive displacement of any group.

This specification signed and witnessed this 7th day of September, A. D. 1899.

PAUL A. WAGNER.

In presence of—

ANTHONY N. JESBERA,

W. B. GREELEY.