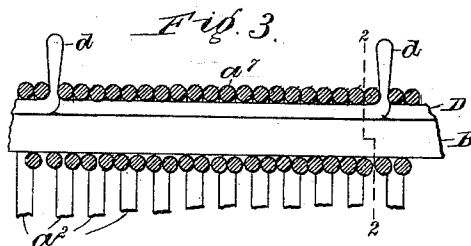
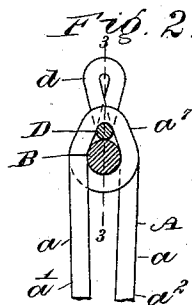
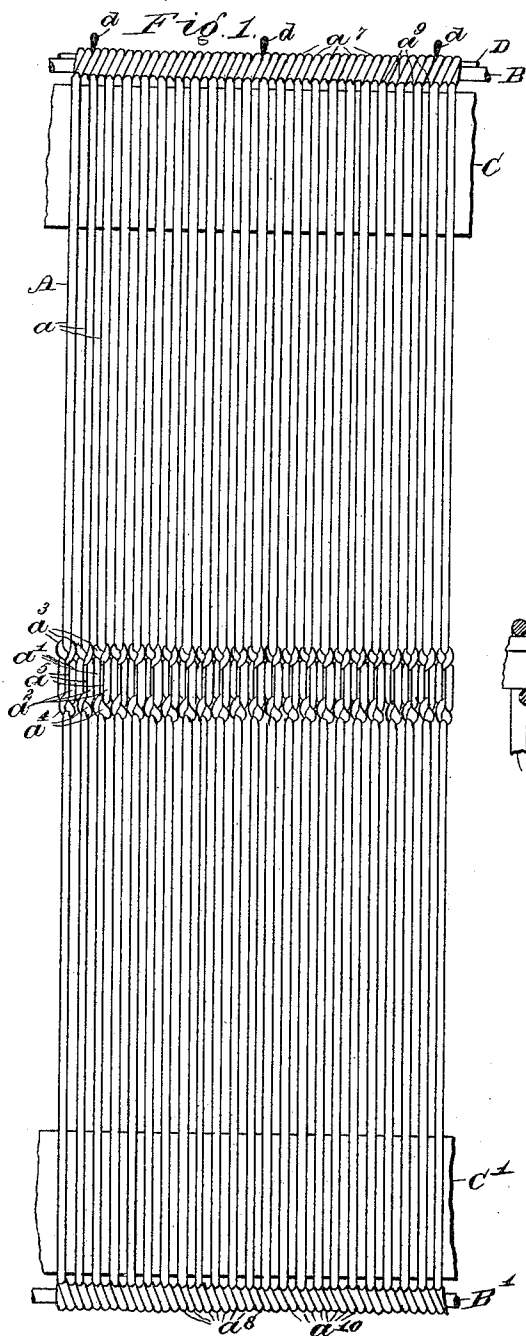


(No Model.)

E. A. PENNOYER & C. B. WEBSTER.
LOOM HARNESS.

No. 585,401.

Patented June 29, 1897.



WITNESSES.

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UNITED STATES PATENT OFFICE.

EDWARD A. PENNOYER AND CHARLES B. WEBSTER, OF LOWELL, MASSACHUSETTS; SAID PENNOYER ASSIGNOR TO SAID WEBSTER.

LOOM-HARNESS.

SPECIFICATION forming part of Letters Patent No. 585,401, dated June 29, 1897.

Application filed January 31, 1894. Serial No. 498,566. (No model.)

To all whom it may concern:

Be it known that we, EDWARD A. PENNOYER and CHARLES B. WEBSTER, citizens of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Loom-Harnesses, of which the following is a specification.

Our invention relates to loom-harnesses; and it consists in providing such harnesses with a twine or cord which projects from the harness at regular intervals to form a bier-mark. Warp-yarns are counted by biers, forty threads on the warp-beam constituting a bier, alternate threads being arranged in the different halves of the shed—that is, half of the threads of a bier being raised and lowered by one harness and the other half by the other harness, where only two harnesses are used, and the healds or heddles being divided in each harness into half-biers by bier-marks, usually formed by painting or staining a portion of every twentieth heddle while the harness is in process of manufacture. It is almost impossible by this method to avoid smearing the heddles adjacent to those to which the color is applied, so that frequently it is difficult or impossible to tell which heddles are intended to be marked.

A tokening-thread has been attached to the harness at or near the edge of the same in the form of long loops which extend from one division to the next—that is, the thread floats over twenty heddles and at intervals of twenty heddles or half a bier is looped around the back-band—making the floating loops, on an average, nearly an inch long. These floating loops are frequently caught and broken out in the handling of the harnesses and cannot be replaced, and do not afford a perfectly satisfactory indication of the division when placed on the edge of the harness, because in that case said loops present to the eye the effect of an unbroken line. Another objection to these floating-loop bier-marks is that if the machine which forms them fails for any reason to connect the tokening-cord to the back-band at the proper place the defect cannot be remedied after such place has been passed in the operation of the machine except by removing all the subsequently-formed heddles and be-

ginning over again at the place of the omitted bier-mark. When these floating loops are cut or broken, the tokening-thread is not sufficiently held in the harness to prevent its falling out, it being merely looped around the back-band. Such floating bier-marks are used in what are called “single-knot” harnesses, being introduced into the light half of the harness, or that half in which the yarn-eye of each heddle is connected to the back-band by a single twine, as shown and described in the United States patent to George W. Harris and William R. Harris, No. 44,186, dated September 13, 1864.

In double-knot harnesses, where the yarn-eye is connected to the back-bands at each side by double twines, it has hitherto been found practically impossible to introduce the floating-loop bier-mark, as such bier-mark can only be introduced without loss to the manufacturer by the automatic action of the harness-forming machine, and up to the present time, although considerable study has been given to the subject, no way has been found of attaching a tokening or bier-marking cord to a double-knotted harness. Double-knotted harnesses are generally preferred as being stronger, because having no “light” side, each side of a double-knot harness being as strong as the strongest side of the single-knot harness, and are also superior to the single-knot harness owing to the yarn-eye being alike at both sides, less liable to catch and injure the yarn, and more durable. Hitherto the bier-marks of double-knot harnesses have always been formed by painting or staining.

By the invention hereinafter described the harness is provided with a distinct easily-observed bier-mark not liable to be removed by accident; and the invention is applicable to double-knot harnesses or to any harness in which the back-bands are surrounded by the twine which forms the heddles.

In the accompanying drawings, Figure 1 is a front elevation of a portion of a loom-harness provided with our invention; Fig. 2, a vertical cross-section of the back-band and the tokening-thread on the line 2 2 in Fig. 3, showing in side elevation a bier-mark and the adjacent parts of a heddle; Fig. 3, a vertical central section on the line 3 3 in Fig. 2

of the attaching-loops of the heddles, showing in front elevation a back-band, the tokening-thread, two bier-marks, and adjacent portions of the heddles.

5 The harness A, heddles a , back-bands B B', and harness-shafts C C' are all of the usual construction and operation, the harness being of the kind known as "double-knot" harness, each heddle a consisting of two threads or
 10 twines $a^1 a^2$ twice knotted to each other at $a^3 a^4$ to form yarn-eyes a^5 to receive warp-yarns, the ends of each heddle being looped around the back-bands B B' at $a^7 a^8$ and tied or fastened thereto at $a^9 a^{10}$ by the binders.
 15 The tokening-thread or bier-marking cord D is introduced with one of the back-bands B and is surrounded by the loops a^7 along the entire edge of the harness at one side thereof, but after every twentieth heddle said thread
 20 or cord D is drawn laterally away from the back-band B to form a loop d , which projects from the edge of the harness, by means of a hook or point which enters between said back-band and tokening-thread and draws
 25 said tokening-thread away from said band and over the completed heddle ends for a sufficient distance to give a proper length to the bier-marking loop d , and said loop is held
 30 by said point or hook until one or more additional heddle-loops a^7 are completed beyond said loop a^7 , and this operation is repeated

after every twentieth heddle until the harness is completed. The tokening-thread is held so firmly by the loops a^7 that it is not liable to slip, and the bier-marking loops are 35 so small that there is little danger of their being broken, and even if broken the tufts formed by the halves of said bier-marking loops serve the same purpose as the unbroken loops. In fact there is no objection to cutting the loops in the middle. 40

The tokening thread or cord is preferably, but not necessarily, of a different color from the twines that form the heddles.

We claim as our invention— 45

A harness, having a back-band and having heddles, the ends of which are looped around said back-band, and having a tokening thread or cord arranged with said back-band in the loops of said heddles and projecting from said 50 harness at intervals to form bier-marks, as and for the purpose specified.

In witness whereof we have signed this specification, in the presence of two attesting witnesses, this 27th day of January, A. D. 55 1894.

EDWARD A. PENNOYER.
 CHARLES B. WEBSTER.

Witnesses:

ALBERT M. MOORE,
 JOSEPH W. PUPER.