(No Model.)

W. C. LOVERING.

METHOD OF PROTECTING MANUFACTURERS OF CLOTH AGAINST LOSS OF CLOTH IN WEAVING.

No. 432,536. Patented July 22, 1890.

Fig. 1.

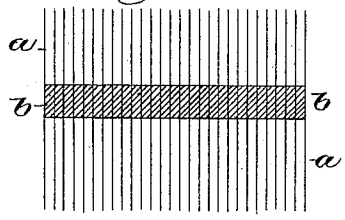


Fig. 2.

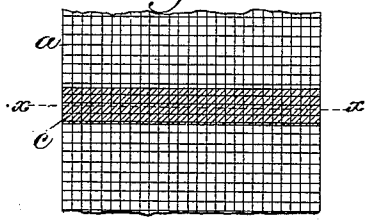


Fig. 3.

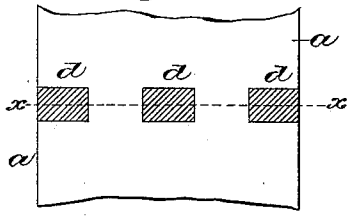


Fig. 4.

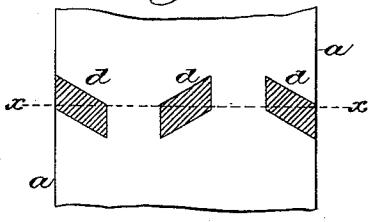


Fig. 5.

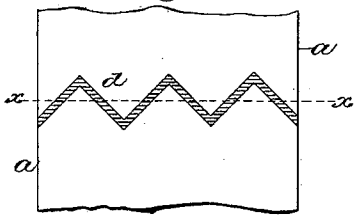


Fig. 6.

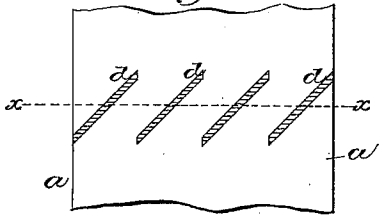


Fig. 7.

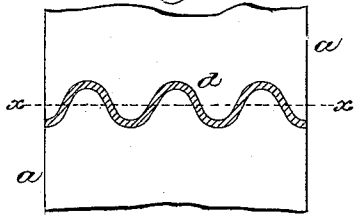


Fig. 8.

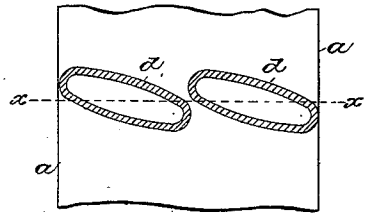
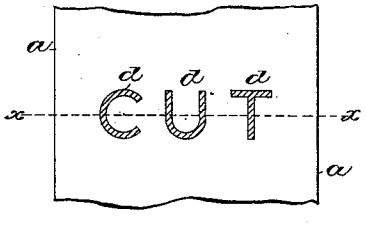


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM C. LOVERING, OF TAUNTON, MASSACHUSETTS.

METHOD OF PROTECTING MANUFACTURERS OF CLOTH AGAINST LOSS OF CLOTH IN WEAVING.

SPECIFICATION forming part of Letters Patent No. 432,536, dated July 22, 1890.

Application filed October 10, 1889. Serial No. 326,627. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. LOVERING, of Taunton, county of Bristol, State of Massachusetts, have invented an Improvement in Methods of Protecting Manufacturers of Cloth against Loss of Cloth in Weaving, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In the manufacture of cloth upon looms the weavers are paid by the "cut" and the manufacturer estimates the product of the loom by the cut. To designate these cuts the warp as it is being sized and dried in the sizing and drying machine, or as it is being otherwise prepared for the loom, has some of its threads, especially those which are to appear in the selvage of the woven cloth, marked at intervals to designate the cut. At the present time the manufacturers are subjected to very considerable loss, for frequently a weaver will tear off one end of the cut after it has been woven and is ready to be removed from the loom. The manufacturer has no means by which to detect this loss unless the cut be actually measured when handed in; but this, it will be seen, is impracticable because of expense. As now practiced, each weaver receives warp sufficient for a number of cuts and is supposed to return its equivalent in cloth; but a weaver may tear a number of yards of cloth from any cut and defy detection unless at very considerable cost. In my efforts to guard against this loss of cloth I have devised a method of marking the warp and cutting the cloth, whereby loss of cloth may be readily detected.

In accordance with my invention the warp during the sizing and drying operation, or before it is put into the loom to be woven into cloth, is provided with a "cut-mark" of such width, length, shape, or character that when the warp so marked is woven into cloth the cut-mark, together with the filling, produces a "cut-figure" of such width, length, or shape that when the cloth is severed through the cut-figure to remove a cut from the loom a part of the cut-figure will be left at the last or finished end of one and at the first or commencement end of the next cut. In this way it is impossible for the weaver to retain any cloth without discovery, for the ends of each cut delivered must show part of the cut-figures, which may be matched, if desired. It has been found that the cut-figures in the woven cloth vary very considerably even when the cut-marks in the warp are substantially the same, and in practice this variation is sufficient to enable the manufacturer, should he so desire, to positively match the ends of any two consecutive cuts.

The form of the cut-mark on the warp and of the cut-figure may be variously modified, thus enabling each manufacturer to readily tell his own cloth or to tell the cloth woven in any particular mill.

Figure 1 shows part of a warp cut-marked in accordance with one form of my invention. Fig. 2 shows a piece of cloth having a cut-figure, supposed to have been woven from a warp having a cut-mark such as shown in Fig. 1, the section-line x showing the line in which the cloth is divided or cut widthwise to form the cut; and Figs. 3 to 9 show pieces of cloth having some of the many different cut-figures which may be employed and fall within the scope of my invention, it being understood that the cut-figure will be substantially the same in its general outline as the cut-mark printed on the warp before it is woven into cloth.

Prior to my invention to be herein described it has been customary to mark at suitable intervals with a small mark a few of the warp-threads at one edge of the body of the warp to indicate the point at which the cut is to be removed from the loom; but such cut-marks have not been made of sufficient length and shape as to leave a defined cut-mark large enough to show at each of the two ends of cloth made by severing the latter to form "cuts."

With but a slight cut-mark, such as commonly made and that at but one selvage, the weaver may with a pencil readily make a mark at the end of a cut to counterfeit or imitate a small cut-mark or spot; but when the mark is made broad and extended across the warp for the whole or for a substantial part of its width and over a portion of the length of the warp the operator cannot counterfeit the cut-mark.

Referring to Fig. 1, the warp *a* is shown as marked across from edge to edge, as at *b*. The warp *a*, having a cut-mark such as shown at *b* when woven into cloth with a weft-thread, will present a cut-figure *c*, corresponding substantially with the cut-mark, so that when the cloth is divided widthwise to form a cut, the division being through the cut-figure *c*, as in the line *x*, a well-defined portion of each cut-figure will appear at the end of the removed cut and also at the end of the cut or portion remaining in the loom.

I find that the cut-figures vary considerably in appearance in the cloth, even when the cut-marks are substantially the same, the difference in appearance arising from various causes—as, for instance, the marking material may adhere more or less to the different threads of the warp at different markings, or more or less marking material may be detached from the warp-threads by the eyes of the harnesses, or the tension on the individual warp-threads may be more or less and unlike or different in degree, all or any of which causes, affect the cut-figure, and is sufficiently prominent to enable the ends of the cuts to be matched at any time.

In Figs. 3 to 9 I have shown only the two side or selvage warp-threads, the other threads being omitted to save labor in the drawings. In Fig. 3 the cut-mark is broken into three blocks *d d d*, extended straight across the warp. In Fig. 4 the cut-marks are diagonally placed and of considerable width. In Fig. 5 the cut-mark represents a zigzag line. In Fig. 6 the cut-mark shows several narrow parallel lines. In Fig. 7 the cut-mark is made as a curved line. In Fig. 8 the cut-mark shows oval rings, and in Fig. 9 the cut-mark is made to represent letters.

From the foregoing it will be seen that a great variety of cut-marks may be made on the warp and all be effective so long as they are of such width, length, or shape with relation to the length and width of the warp as to produce cut-figures in the cloth of such shape and length or width and location that they cannot be readily counterfeited by the weaver, and so that when the cloth is torn or divided widthwise or from selvage to selvage through the cut-figures to form cuts the ends of the cuts will show well-defined cut-figures and enable the manufacturer to match the ends of the cuts, if desired.

In another application, Serial No. 326,626, filed by me for United States Patent, I have shown a sizing-machine having marking mechanism by which to automatically provide the warp with cut-marks, the said marks being separated for any desired number of yards, according to the length desired for the cuts. The marking devices shown in the said application consist, essentially, of a bed or printing-roller extended across the warp from selvage to selvage, but normally out of contact therewith, an ink well or trough and ink-roller therein to apply ink or any usual color mixture to the bed or printing-roll, and an impression pad or device, which, at the desired intervals, is brought against the warp at its side opposite the said bed or printing-roll, the impression-pad at such time causing the said warp and the bed or printing-roll to be put in contact and remain in contact for a sufficient length of time to enable a well-defined cut-mark to be printed on the warp, the said cut-mark being extended more or less along the warp-threads back in the direction of their length and width to enable the production in the woven cloth of a cut-figure of a size to be easily divided, as described, and leave a well-defined portion of the cut-figure at each end of the cut.

The impression-pad will preferably have a surface speed or movement substantially equal to the speed of movement of the warp through the machine. The cut-mark may, however, be produced by various devices and at various stages in the preparation of the warp for the loom.

The marked warp will be put into the heddles of the loom-harness and be woven in usual manner.

This my invention is adapted for use with warps of cotton, wool, or other material.

I am aware that party-colored yarns have been woven into carpets and other fabrics to constitute a figure or produce a mottled surface, and so I do not claim producing a figure by the employment of a party-colored yarn.

The surface of the printing-roll may be either smooth or cut to leave the desired cut-mark.

I claim—

The method of preventing embezzlement and waste of cloth, which consists in providing the warp at intervals with a superficially-extended well-defined cut-mark, then weaving the said warp with suitable weft and thus producing or developing a cut-figure extending longitudinally and laterally of the woven web, and finally dividing the cloth or web through the cut-figure, so as to leave on the cloth a portion of such cut-figure on each side of the line of division, substantially as described.

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

WILLIAM C. LOVERING.

Witnesses:

JAS. H. CHURCHILL,

B. DEWAR.