

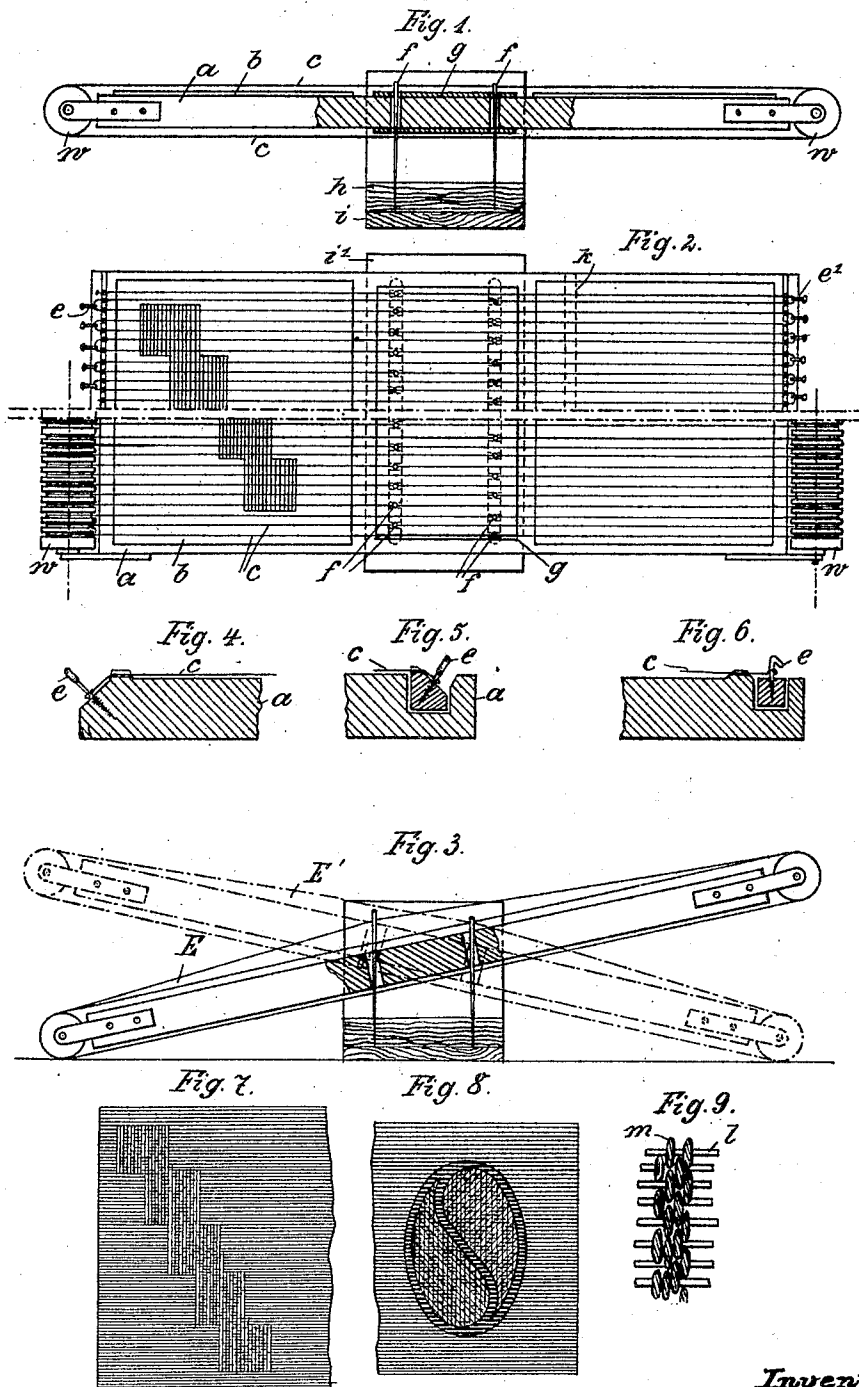
Apr. 10, 1923.

1,451,641

G. WITTE

HAND LOOM WITH DEVICE FOR READING WEAVING DRAWINGS

Filed Aug. 29, 1921



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Patented Apr. 10, 1923.

1,451,641

# UNITED STATES PATENT OFFICE.

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HAND LOOM WITH DEVICE FOR READING WEAVING DRAWINGS.

Application filed August 29, 1921. Serial No. 496,465.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

*To all whom it may concern:*

Be it known that I, GERTRUD WITTE, residing at Berne, Switzerland, have invented certain new and useful Improvements in Hand Looms with Device for Reading Weaving Drawings (for which I have filed applications in Germany Sept. 17, 1919, No. 338,273; in France July 8, 1920, No. 519,785; in Belgium July 3, 1920, No. 288,595; in Denmark July 21, 1920, No. 29632; in Norway June 28, 1920, No. 3774; in Italy July 10, 1920, No. 14/41; in England July 10, 1920, No. 148765; in Austria March 21, 1921; in Holland July 24, 1920, and in Sweden June 30, 1920), of which the following is a specification.

This invention relates in general to hand-loom which are provided with a device for reading weaving drawings and in which the warp is stretched slightly above a plate upon which the weaving drawing is placed and more particularly to weaving apparatus of this kind in which the whole frame that supports the weaving plate is arranged to be tilted in see-saw fashion on a fulcrum consisting of two rows of erect needles or combs and in such a manner that, on the frame being moved up and down, the sheds through which the woof is shot are formed automatically.

In the drawing a constructional form of the invention is shown in which the stretched warp forms the shed with the aid of two rows of needles when the weaving plate is tilted up and down. The direction of the warp-threads is preferably not reversed immediately at the end of the weaving plate, but these threads are passed round the foot of the apparatus so that practically the whole length of the warp can be used for making the web.

Fig. 1 shows a side view of the apparatus partly in section.

Fig. 2 represents a plan view in which two ways of stretching the warp are shown.

Fig. 3 illustrates the frame in the two positions into which it is tilted to form the sheds.

Figs. 4 to 6 illustrate details of the warp fixing contrivance.

Figs. 7 to 9 show finished pieces of web.

In Fig. 1 *a* is a weaving plate the two ends of which are arranged for the reception of the warp-threads and upon which the weav-

ing drawing *b* is fixed in a manner suited to the material from which it is made. The warp-threads *c* are so arranged as to extend quite near to the surface of the plate *a* and they may be spaced by passing a thread round the ends of the plate or round grooved rollers *w* situated at these ends as shown in Fig. 1 and the lower half of Fig. 2. An alternative arrangement of the warp-thread consists in passing it to and fro across the plate from *e* to *e'* in serpentine fashion as illustrated in the upper half of Fig. 2 and in Figs 4 to 6. To this end hooked eyes *e* or nails are provided which are fixed at the ends of the plate *a* in small wooden laths that are sunk into grooves in the plate (Figs 4, 5 and 6). An alternative arrangement consists in small metal or steel strips equipped with small hooks and fixed beneath the plate. In the constructional form shown the device for forming the sheds through which the woof is passed consists of two rows of needles *f* having eyes at their upper ends through which the warp-threads *c* pass. The needles extend through holes in two perforated plates *g* between which the plate *a* is sandwiched, the warp-threads with uneven numbers 1, 3, 5, 7, etc., passing through the first row of needles and the threads with even numbers 2, 4, 6, 8, etc., passing through the second row. The points of the needles are lodged in a piece of felt *h* upon a small board *i*. The rows of needles are parallel to each other and the needles are ordinarily perpendicular to the surface of the plate *a*, Fig. 1. The plate *a* is guided at the sides by two small boards *i'*.

Fig. 3 shows the loom in the two positions in which the sheds are formed. If the loom is placed flat on the table one of its ends will tilt down so that the needles will extend obliquely to the plate and the one row of them will protrude further than usual above the top surface of the plate. Hence the warp-threads held by this row of needles will be lifted and the woof-thread may be pushed through at *E* by means of a large needle and the proper length and position of the same can be precisely read or judged by the drawing that is immediately beneath the warp-threads. When the plate is subsequently tilted over to the other side all the threads of the other row are lifted and the woof can then be passed through at

E'. The row of threads that is not lifted always remains down quite close to the drawing so that all reading can be taken very precisely.

- 5 Figs. 7 and 8 show two patterns of web that can be carried out with the described apparatus. The different hatchings in Fig. 8 are intended to indicate different colours. In order to be able to change the warp for a  
10 while for small parts of the web a groove *k* may be provided in the plate *a* into which a lath with pegs according to Figs. 5 or 6 can be inserted. Fig. 9 shows a fragment of web on an enlarged scale *l* being the warp  
15 and *m* the woof.

I claim:

- A hand loom for weaving patterns according to a weaving drawing comprising a plate for holding a drawing, a device for stretching the warp-thread across the plate close to  
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the drawing, the plate being provided with two rows of needle holes, two rows of needles passing through two rows of needle holes in the said plate, eyes in the said needles for the warp-threads, and a holding member for holding the said needles in an upright position, the plate being adapted to be suspended by the threads passing through said needles and to be tilted to and fro on the two rows of needles, whereby first one row of needles and then the other is caused to protrude more than usual through the said plate.

In testimony whereof I affix my signature in presence of two witnesses.

GERTRUD WITTE.

Witnesses:

J. ALLEN,  
A. ZAHNOL.