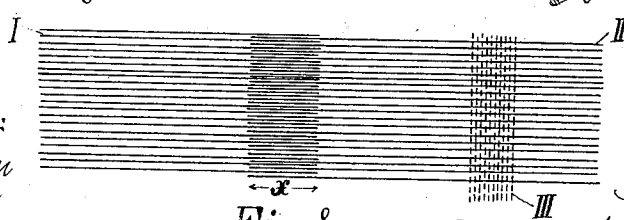
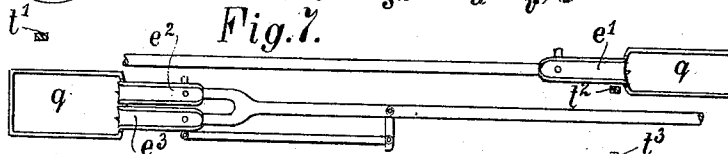
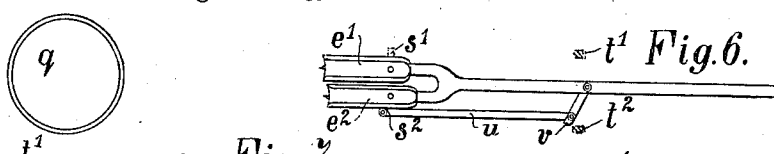
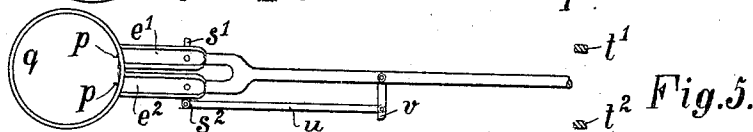
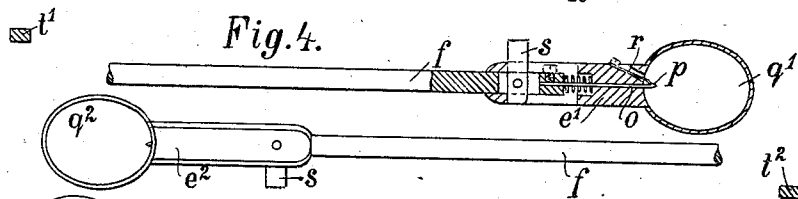
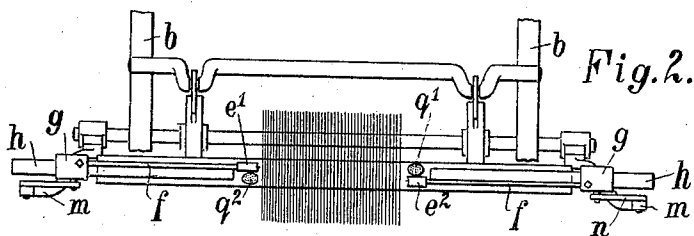
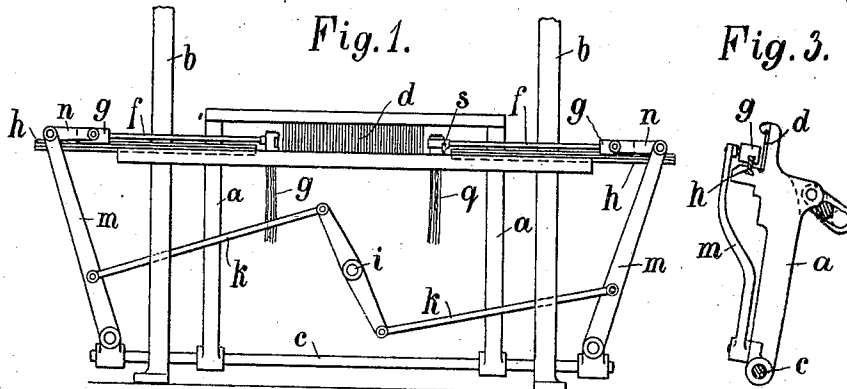


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 LOOM FOR WEAVING HORSEHAIR FABRICS.
 APPLICATION FILED DEC. 27, 1906.

1,054,537.

Patented Feb. 25, 1913.



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LOOM FOR WEAVING HORSEHAIR FABRICS.

1,054,537.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed December 27, 1906. Serial No. 349,728.

To all whom it may concern:

Be it known that I, CARL RICHARD GROSSLAUB, subject of the German Emperor, residing at Hainichen, in the Kingdom of Saxony and Empire of Germany, have invented certain new and useful Improvements in Looms for Weaving Horsehair Fabrics, of which the following is a specification.

This invention relates to a weaving loom for the production of horse-hair fabrics and the like.

As is well known fabrics with horse-hair weft threads are the more expensive the greater the length of the horse-hair threads employed is, that is to say the price of horse-hair fabric increases progressively with the length of the hair used in the manufacture thereof. For the purpose of doing away with this drawback the fabric produced by the present method and by the weaving-loom described later on differs from known fabrics by the fact that the horse-hair weft-threads thereof are not continuous, that is to say that the length of the weft-threads used in the manufacture of the said fabric is less than the width of the web. These weft-threads do not, therefore, extend in continuous lines from one side of the web to the other, but two or more shorter lengths of horse-hair are used, arranged substantially in alinement with each other, or in other words one hair forms the continuation of another one.

The method employed in the manufacture of this horse-hair fabric consists in that the horse-hair threads consisting of several non-continuous or partial lengths are simultaneously or successively shot into the open shed from one and the same side of the fabric or from both sides thereof. This may be accomplished in several ways, for instance by means of shuttles or gripping devices and the like, but the human hand may also serve for such purpose. The weaving-loom in which said method is set into operation and the fabric above referred to produced, with the latter is illustrated in the annexed drawing showing several embodiments thereof. In said loom the horse-hair weft threads are shot in by means of two or more needle devices, this in accordance with the present method being accomplished from one and the same side or from opposite sides in that said needle devices travel into the shed in an empty state, each fetch a hair from the other

side and place it within said shed as required.

In the drawing Figure 1 is a front view, Fig. 2 a top-view and Fig. 3 a side-view of a portion of the loom illustrating the parts thereof necessary for understanding and setting the present invention into operation. Fig. 4 represents some details shown in Fig. 2 to a larger scale. Figs. 5, 6 and 7 respectively illustrate modifications of the parts represented in Fig. 4, and Fig. 8 is a diagrammatic view of a fabric formed by my improved loom.

a, Fig. 1, is the lay of the loom pivoted to the shaft *c* stationary in the frame-walls *b*. Respectively fixed to the end of long rods *f* are needles *e*¹, *e*², Figs. 1-4, adapted to be moved rectilinearly thereby passing in front of the reed *d*. The other end of said rods *f* is attached to a slide *g* respectively adapted to move in prismatic ways *h* arranged on the laterally prolonged race of the lay. This slide *g* is driven by means of an oscillating shaft *i* provided with a two-armed lever adapted to move the two connecting-rods *m* to and fro by means of links *k*. The lower ends of said connecting-rods *m* are pivoted to the lay-shaft *c* and the upper ends thereof movably connected to said slide *g* by means of short connecting-rods *n*. Consequently when the shaft *i* is reciprocated the two gripping-needles *e*¹ and *e*² are forced to slide to and fro along the reed *d*.

The construction of the needles *e*¹ and *e*² *per se* is well known; it is provided with a hook *o* adapted to be removed longitudinally and terminating at the point in a fine barb *p* enabling it when pushed or thrust against the bundle of horse-hair *q*¹ or *q*² to catch or single out one hair. This hair is held fast by the spring *r* till the dog *s* abuts against a stationary tappet *t*¹, *t*², *t*³ respectively and the barb *p* in consequence thereof lets go the horse-hair thread held fast till then. Said tappet *t*¹, *t*², or *t*³ is fixed in such a place, respectively, as to enable the horse-hair thread to be slipped at the moment it with its one end joins or continues the second or third horse-hair shot into the same shed.

Instead of shooting in the two horse-hair threads from opposite sides of the shed as described above, it also is possible to fetch them from one and the same side, this being indicated in Fig. 5.

From the bundle of horse-hair *q* the

needles e^1 and e^2 each collect a hair and draw it into the shed. Now the dog s^1 abuts against the corresponding tappet t^1 and brings about the release of the hair when one end thereof has been drawn completely through the shed and the back end is about in the middle of the web the gripping-needle e^2 on the contrary will already let the hair go after it has completed the first half of its way. For its dog s^2 is pivoted to a small contact-lever v by means of a connecting-rod u , this lever v coming up much earlier against its respective dog t^2 . This moment is illustrated in Fig. 6. In consequence thereof the hair-thread which is shot in by the gripping-needle e^2 is drawn from the left edge of the web only to about the center thereof, the other horse-hair shot in by the gripping-needle e^1 commencing but at the middle of the web and extending to the right edge of the web. The finished fabric in this case is of precisely the same quality as that produced by the arrangement according to Figs. 1-4.

The construction shown in Fig. 7 is provided with three gripping-needles e^1 , e^2 and e^3 . Of these e^1 and e^2 operate in precisely the same manner as explained in connection with Fig. 4 while e^3 operates next to e^2 in the manner specified in regard to Fig. 5. For the sake of saving space the receptacles holding the bundles q of horse-hair are of square form, they in the other figures being of round or oval shape. Otherwise the fabric produced on said loom is not confined to any particular style of weaving and the warp threads and binding threads can be of any suitable material, as for instance cotton, wool, silk or the like.

In Fig. 8 of the drawing the solid lines marked I and II represent the horse-hair weft threads. A few of the warp threads are indicated by the dotted lines III.

In the example illustrated the horse-hair weft threads extending from the left-hand side of the web toward the center are shorter than the weft-threads extending from the right-hand side of the web, but the shorter and longer weft-threads overlap each other, so that the portion of the fabric indicated by the arrow x has double weft-threads.

As stated above the present horse-hair fabric is far cheaper than that of former manufacture because the price of the horse-hair increases progressively with the length of the hair used in the manufacture thereof. Whereas therefore, ordinary horse-hair fabric is comparatively inexpensive if the fabric is woven in the form of a narrow web the cost is relatively high for larger widths. This is not the case with the improved fabric, inasmuch as the width of the

web is independent of the length of the hair used for the manufacture thereof.

As has already been mentioned, the piece of fabric diagrammatically illustrated in the drawing is only shown as an example, to which the invention is by no means restricted. It is not essential that weft-threads extending from opposite sides of the web should overlap each other, or even that the sum of the lengths of the said threads should be equal to the width of the fabric; if desired the length of the horse-hair threads can be such that a gap free from horse-hair is produced between the inner ends of the said threads. The parallel weft threads extending from each side of the fabric need not be of uniform length, and if the inner ends of the weft-threads overlap each other it is not essential that that portion of the fabric which has double weft-threads should be continuous or in the form of a straight strip parallel with the edges of the web. Moreover it is not essential that only two lengths of horse-hair should be used to extend across the web; three or more separate lengths of horse-hair, arranged substantially in alinement with each other, may be used for this purpose, that is to say in such a manner that the combined length thereof is equal or approximately equal to the width of the web.

Having now fully described my invention I declare that what I claim is:—

1. A loom for making hair fabric comprising in combination, swinging lay through which the warp to form the shed is passed, means for holding a bundle of hair on one side of the shed, and a slide on the lay provided with a plurality of needle devices each inserting a plurality of weft strands or hairs in the shed upon pick of the slide, substantially as described.

2. A loom for making hair fabric comprising in combination, a swinging lay through which the warp to form the shed is passed, means for holding a bundle of hair on one side of the shed, a slide on the lay provided with a plurality of needle devices each inserting a plurality of weft strands or hairs into the shed upon pick of the slide, and elements for operating the needle devices during such pick movement of the slide to deliver the weft strands or hairs at different lateral positions in the shed, substantially as described.

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

CARL RICHARD GROSSLAUB.

Witnesses:

FREDERICK J. DIETZMAN,
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