

(No Model.)

F. OCHS.

MACHINE FOR INTERLACING CURLED HORSE HAIR.

No. 502,376.

Patented Aug. 1, 1893.

Fig. 2.

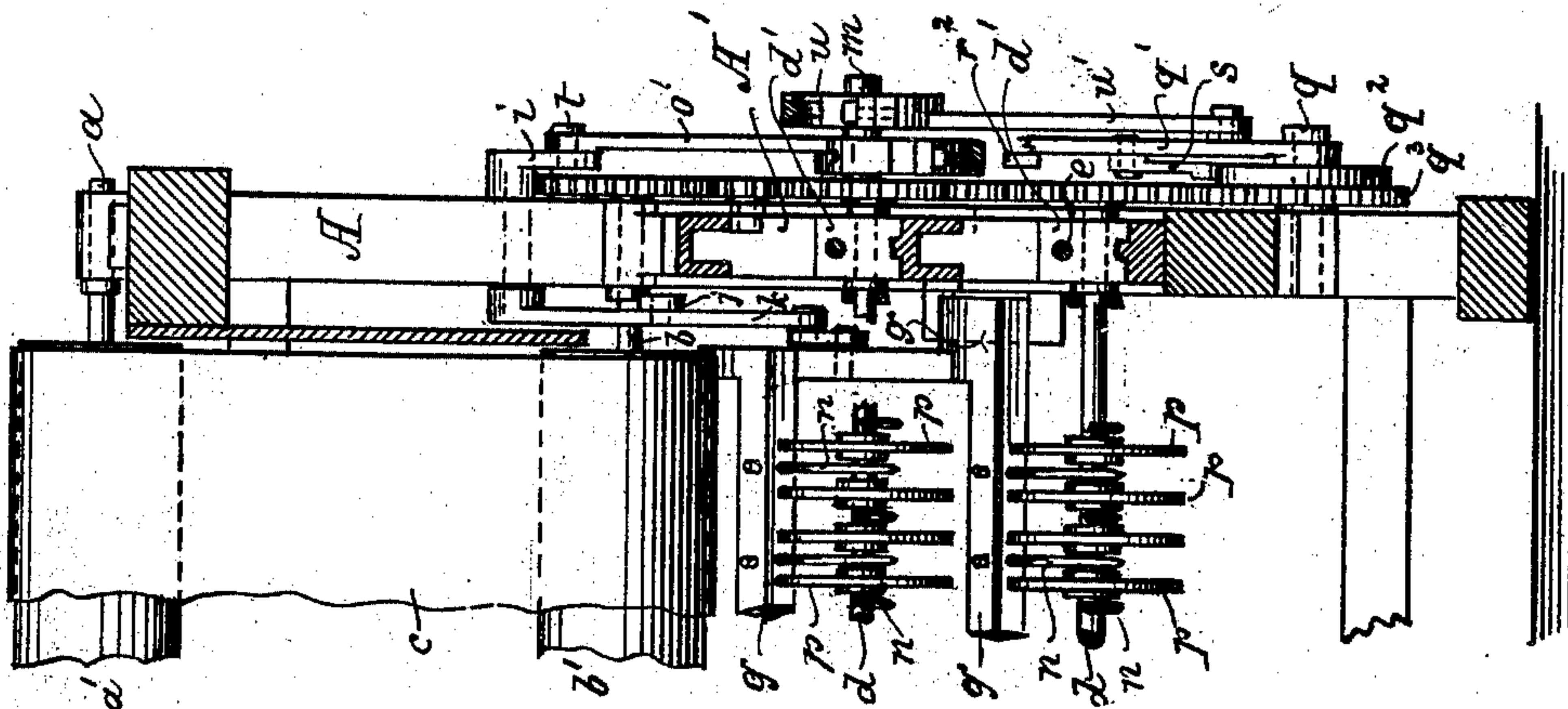
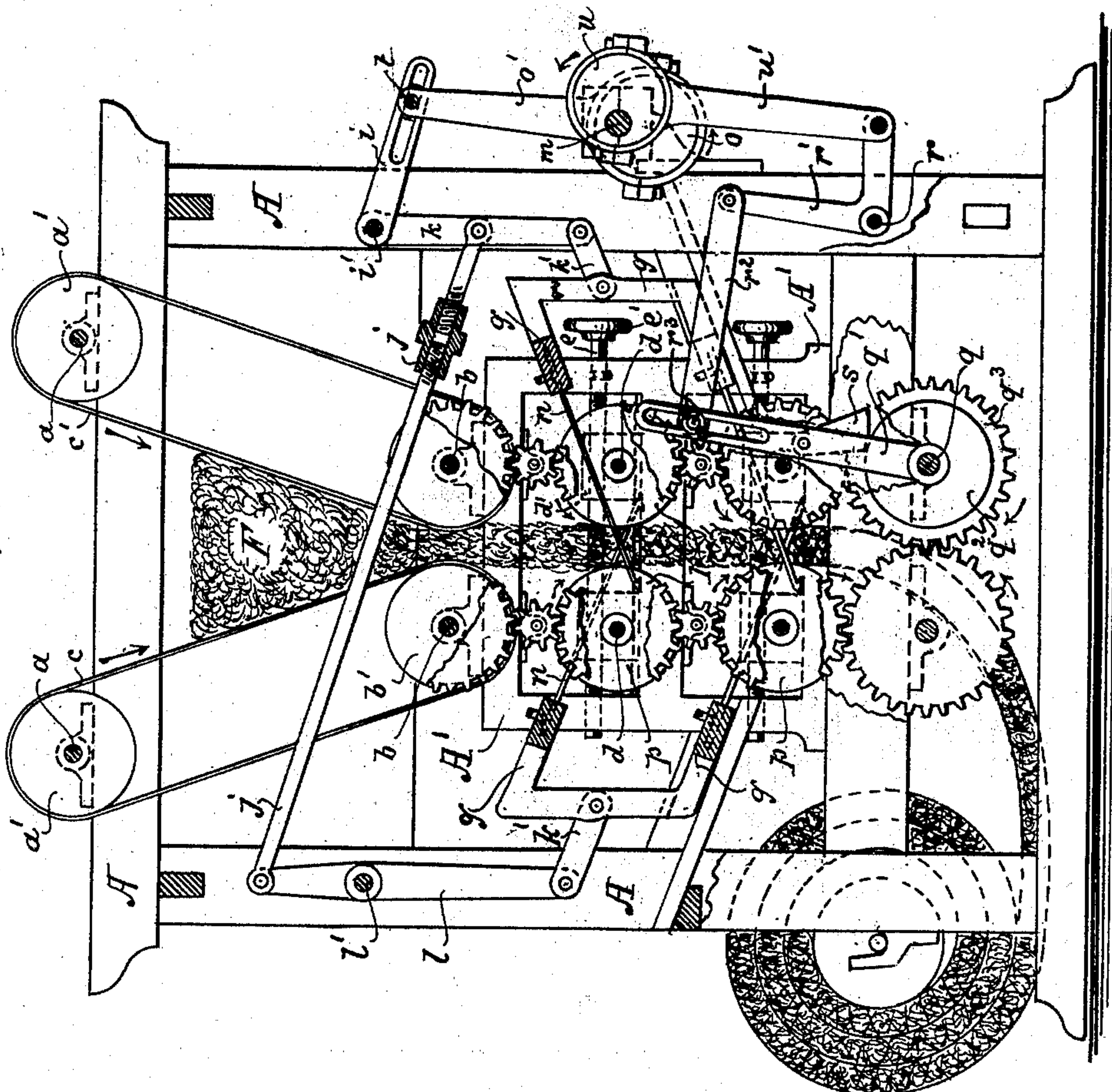


Fig. 1.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRITZ OCHS, OF FÜRTH, GERMANY.

MACHINE FOR INTERLACING CURLED HORSE-HAIR.

SPECIFICATION forming part of Letters Patent No. 502,376, dated August 1, 1893.

Application filed February 8, 1893. Serial No. 461,437. (No model.)

To all whom it may concern:

Be it known that I, FRITZ OCHS, a citizen of the United States, and a resident of Fürth, in the Kingdom of Bavaria, German Empire, have invented certain new and useful Improvements in Machines for Interlacing Curled Horse-Hair, of which the following is a specification.

My invention relates to machines for interlacing curled horse hair and similar material and the object of my improvement is to provide a machine by means of which continuous sheets of fabric of varying length and thickness and of great consistency, can be produced economically and expeditiously.

In the accompanying drawings, Figure 1 represents a side elevation of my machine partially in section. Fig. 2 is an end view of one side of the machine.

Upon the frames A, A' are mounted in adjustable bearings, the parallel shafts *a, a*, and *b, b*, carrying the drums *a' b'* and endless belts *c c'*. The shafts are so arranged that the belts *c c'* are made to travel at an acute angle against each other, forming with the side walls of the frame a trough-like receiver F. The latter is widest at the top and terminates in a narrow slot below, which may be adjusted by shifting the journal-boxes supporting the shafts *b* upon the frame A' horizontally at each end either apart or against each other by loosening the nuts holding the flanges provided with the customary oval slots and by tightening them again after being adjusted or by screw shafts provided with right and left screw threads passing through the bearings as illustrated in Figs. 1 and 2 of the drawings for the adjustment of the bearings *d'* carrying the shafts *d* or in any other suitable manner and by which the thickness of the mattress in course of manufacture is regulated.

Below the shafts *b, b*, are mounted in pairs in adjustable bearings *d'*, sliding upon the frames A' A', a series of shafts *d*, which carry the pressure disks *p* for guiding the mat at the lines of action. To regulate the distance of these shafts *d* equi-distant from a central vertical plane horizontal shafts *e* are mounted in the frames A', and are made free to turn therein. Each shaft *e* is passed through two bearings at the ends of two shafts *d*, and pro-

vided with right screw thread at one end and left screw thread at the other, both engaging with that cut into each respective bearing, *d'*, through which it passes. The end of the screw shafts *e*, where passing through the frame A', are left smooth and to one end of each is secured a hand wheel *e'*.

Upon the shafts *d* are secured at equal distances the pressure disks *p*, which guide the fabric to be treated past the rows of needles or needle-hooks *n*. These rows of needles *n* are placed in pairs, one pair below the other, and the needles of each pair are made to cross each other when actuated at points lying midway between two corresponding shafts *d*, *d*, and in, or near a horizontal plane through the center-lines of two shafts *d* as shown in Figs. 1 and 2. The needles *n* of one row enter into the spaces between two adjoining pressure disks *p*, in such a manner that between each two adjoining needles of one row is always left a space into which the needles of the opposing row are guided, as shown in Fig. 2 of the drawings. The needle-hooks *n* are adjustably secured upon frames *g, g*, and guided within the frames A, A', and actuated from the driving shaft *m* of the machine by means of an eccentric *o*, strap and connecting link *o'*, levers *i, k, l* shafts *i'* and *l'* and connecting links and blocks *k', j'* and *t* in such a manner that the two frames *g g* move obliquely against each other, one from the right to the left and the other from the left to the right; the slight inclination of the needle-hooks pointing downward, in which direction the mat is traveling. Although this movement of two opposing needle-rows is preferable, I do not confine it to any especial angle and find it at times opportune to give one or both of two co-operating rows of needles an obliquely upward motion.

The throw of the needle-rows is regulated by securing the sliding-block *t*, which carries the joint to which the eccentric-strap and connecting link *o'* are attached, in the slot of the lever *i* by means of a screw-bolt and clamp-nut or by any other suitable means in a position more or less distant from the axle of the shaft *i'*. The motion of the eccentric being uniform, the latter, on revolving the main-shaft *m*, will oscillate the lever *i* and thereby the shaft *i'* more or less, correspond-

ing to the position of the sliding block t in the slot of the lever i being selected nearer or farther away from the shaft i' .

The feeding motion of the drums b' and shafts d is preferably actuated by an eccentric u secured upon the shaft m and is adjustable.

Upon a stud q , secured upon the frame A is pivotally mounted the slotted lever q' and also the disk q^2 and the cogwheel q^3 . The two latter are firmly connected and made to turn freely upon the stud q .

A friction pawl S is secured upon the lever q' and will engage with the rim of the friction wheel or disk q^2 and upon oscillating the lever q' by means of the eccentric u , strap and connecting link u' , angle lever r' , stud r , pitman r^2 and sliding joint r^3 , the mat will be fed the desired distance by turning of the disk q^2 and therewith the gear wheel q^3 which in turn will gradually revolve the shafts b and d , by means of gear secured to their ends and appropriate intermediate gear in the desired direction as indicated in Fig. 1 of the drawings during one half of a revolution of the shaft m , while the other half revolution is utilized for the movement of the needle frames carrying the needle hooks during the working operation.

It is apparent that the eccentrics o and u must be adjusted in such a manner that the needle-hooks are at rest or moving beyond the open space in the middle during the feeding operation.

The operation of the machine is then as follows:—The curled horse hair is fed into the receiver F and the machine is set in motion. With the progress of the endless belts the wide layers of curled hair near the top of F will be gradually compressed, and already at the bottom of F form a slightly coherent mat and thus arrive at the first two rows of pressure disks where they will be treated by the first two rows of needle-hooks, one working against the other and both passing entirely through and beyond the mat and on their return pulling against each other hair from both sides simultaneously through the mat which process is repeated below by a second pair of rows of needle-hooks and thereafter by as many pairs as will be found necessary to arrive at the desired result, a thoroughly interwoven mat, when the product will be passed to a winding drum or to any other place of storage.

In the drawings two rows of needles are

shown connected with one frame; although three or more rows could be placed upon each frame or several frames could be employed, one below the other, and the number of shafts carrying pressure disks could be proportionately increased. It is apparent that with this arrangement better results can be obtained as with the one-sided treatment, requiring a reversal of the mat, and much time and space will be saved in employing it.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for interlacing curled horse hair, parallel shafts arranged in pairs one above the other in suitable frames, and carrying pressure disks and gearing at one or both ends, in combination with needle hooks, arranged in rows opposite each other, the needles of two opposing rows being situated in different vertical planes, with frames carrying the needle-hooks, the main frame, feeding aprons, arranged above, and means for operating the parts, as and for the purposes herein shown and set forth.

2. In a machine for interlacing curled horse hair, the needle-hook-frames arranged in pairs, one above the other, needle-hooks carried by said frames and arranged in different vertical planes and levers connected with said frames in combination with the main shaft, an eccentric thereon and connections between said lever and eccentric whereby the frames are caused to approach and recede from each other at each revolution of the main shaft, as and for the purposes herein shown and described.

3. In a machine for interlacing curled horse-hair the combination with pairs of shafts carrying pressure-disks and provided with gears and means to give the disks an adjustable intermittent feed-motion, of pairs of needle-hook-rows, sliding frames carrying said needle-hooks and means for imparting an intermittent, oblique, sidewise motion in opposite directions to said frames and means for varying the limits of said motion, as and for the purposes herein shown and set forth.

Signed at Fürth, in the Kingdom of Bavaria, German Empire, this 24th day of December, A. D. 1892.

FRITZ OCHS.

Witnesses:

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