F. MAUSSNER.

MACHINE FOR INTERLACING CURLED HAIR.

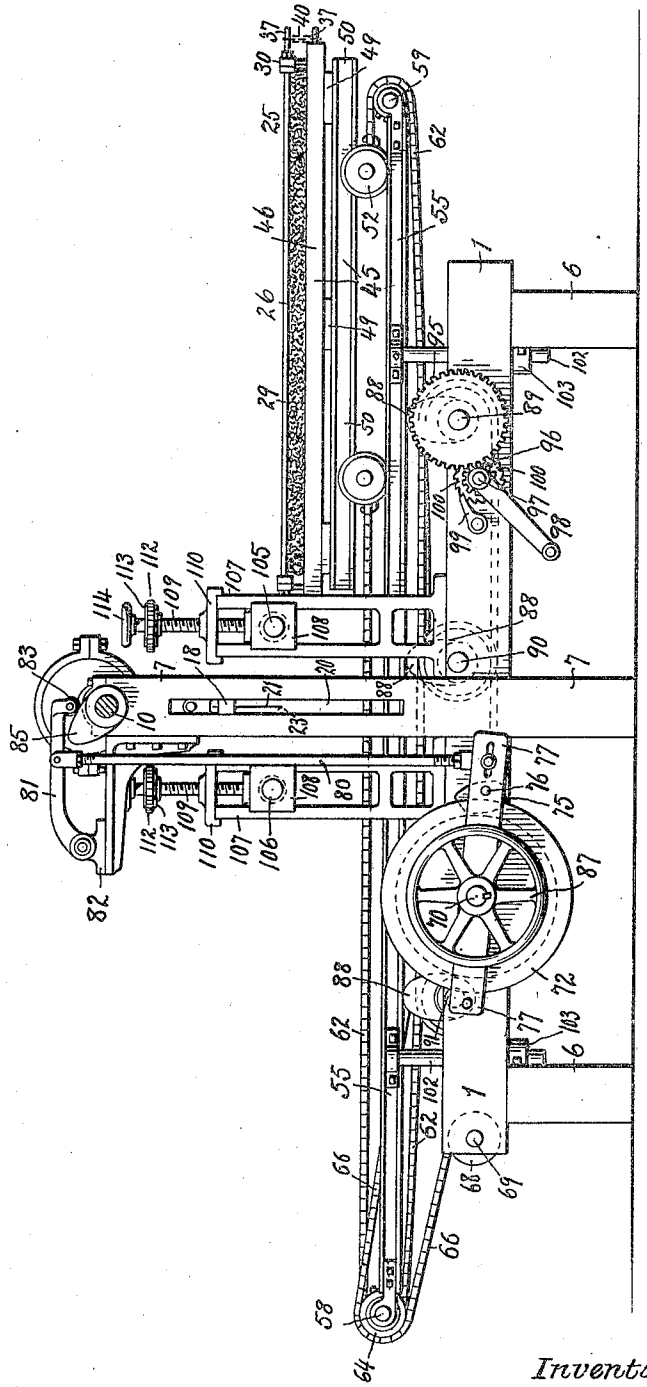
APPLICATION FILED SEPT. 11, 1913.

1,104,368.

Patented July 21, 1914.

5 SHEETS—SHEET 1.

FIG. 1.



Witnesses:

Andrew A. Wright

J. B. Daly

Inventor:

Frederick Maussner

By his Attorney

F. DeWitt Goodwin

F. MAUSSNER.

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5 SHEETS—SHEET 2.

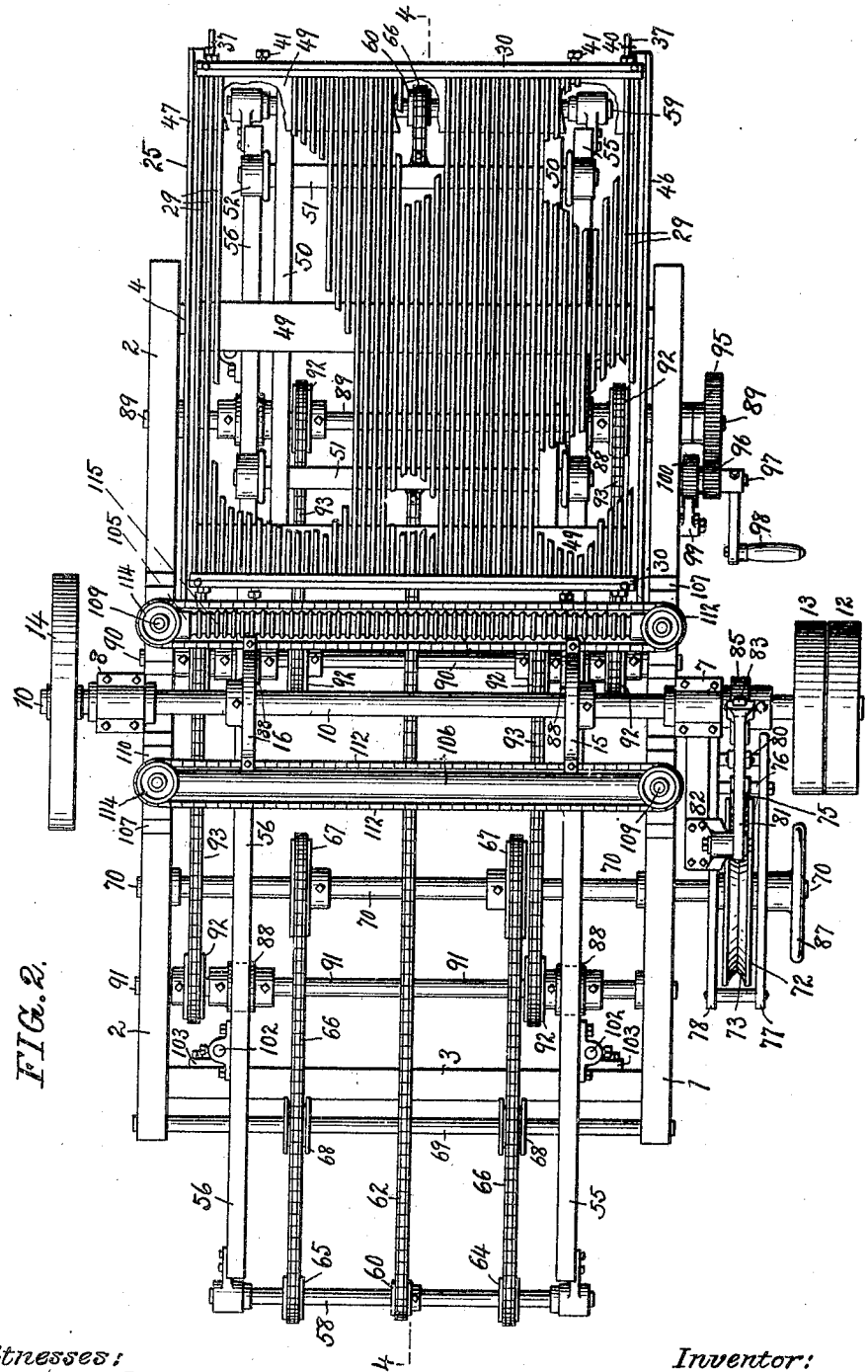


FIG. 2.

Witnesses:

Andrew A. McHugh

J. B. Daly

Inventor:

Frederick Maussner

By his Attorney

F. DeWitt Goodwin

F. MAUSSNER.

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5 SHEETS—SHEET 3.

FIG. 3.

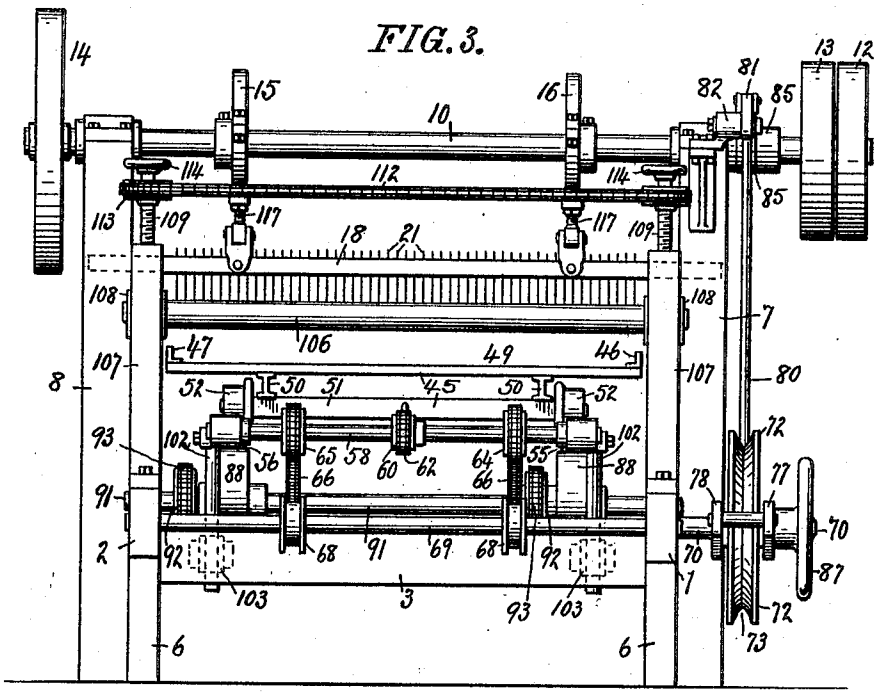


FIG. 10.

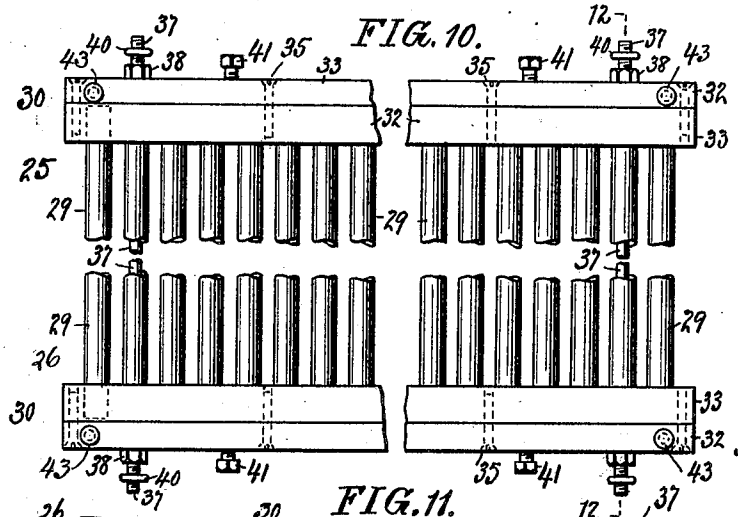


FIG. 12.

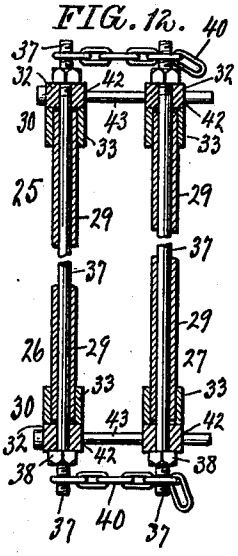
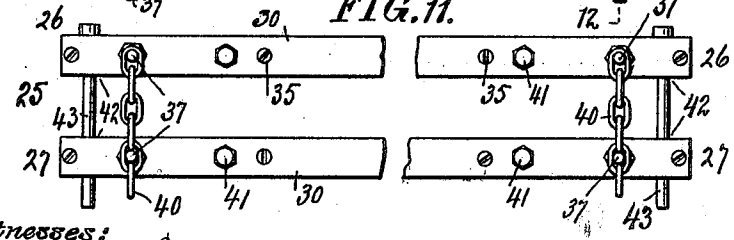


FIG. 11.



Witnesses:

Andrew A. McKeough

J. P. Daley

Inventor:

Frederick Maussner

By his Attorney

F. DeWitt Goodwin

F. MAUSSNER.

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5 SHEETS—SHEET 4.

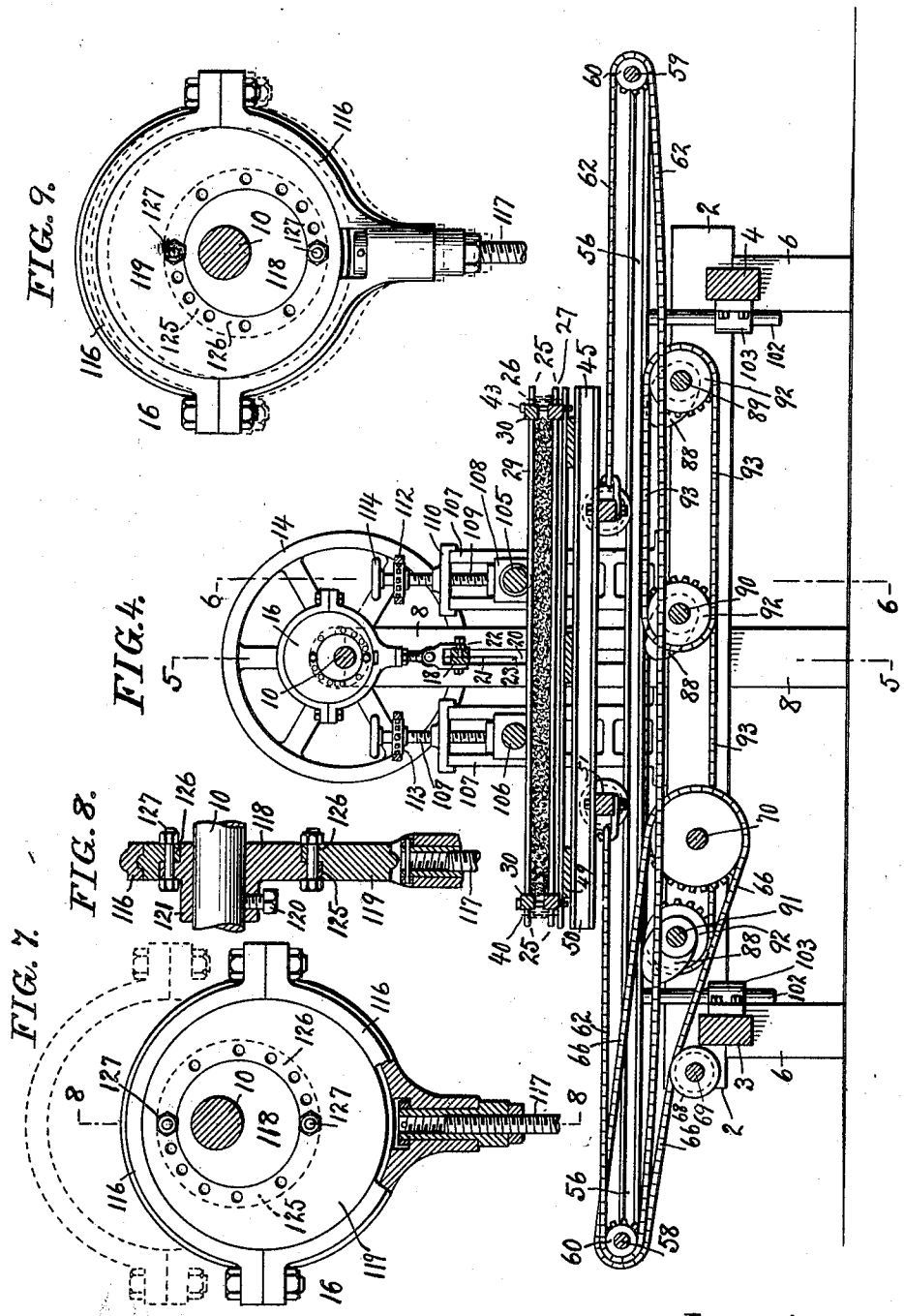


FIG. 9.

FIG. 4.

FIG. 8.

FIG. 7.

Witnesses:
Andrew C. McHugh
J. B. Daly

Inventor:
Frederick Maussner
By his Attorney
F. DeWitt Goodwin

F. MAUSSNER.

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5 SHEETS—SHEET 5.

FIG. 5.

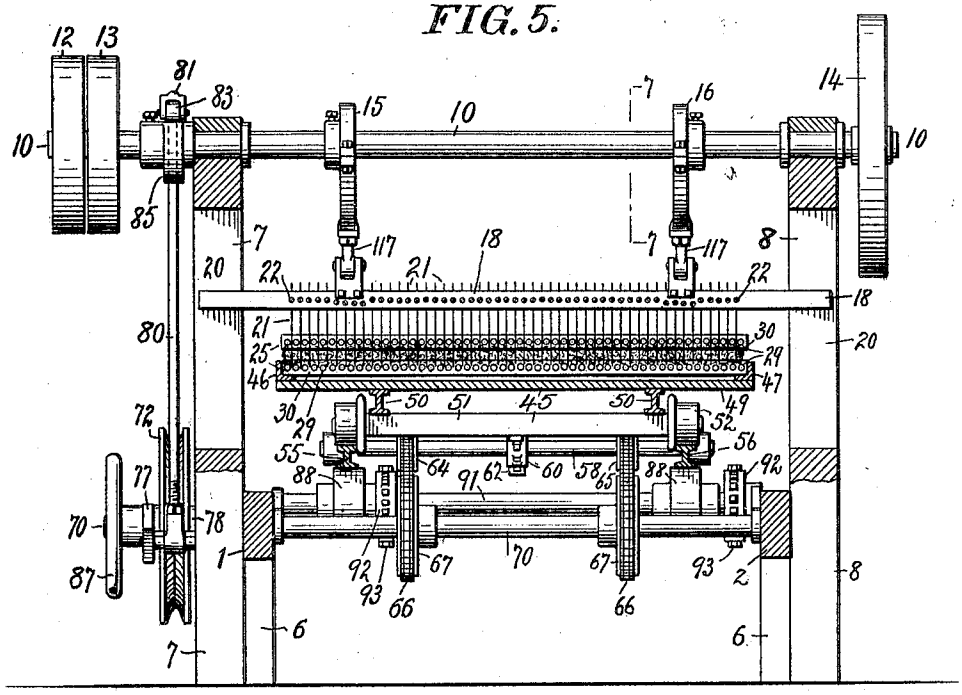
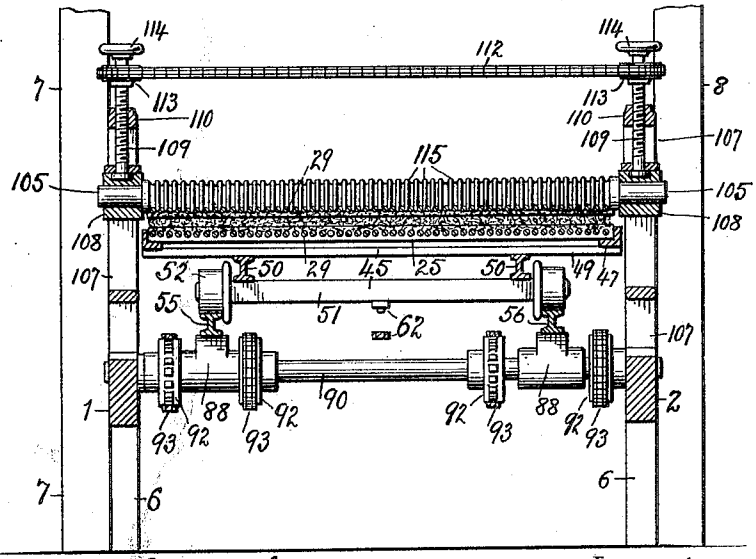


FIG. 6.



Witnesses:
Andrew A. McKeigh
J. B. Daly

Inventor:
Frederick Maussner
By his Attorney
F. DeWitt Goodwin

UNITED STATES PATENT OFFICE.

FREDERICK MAUSSNER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO INTERLACED CURLED HAIR COMPANY, A CORPORATION OF DELAWARE.

MACHINE FOR INTERLACING CURLED HAIR.

1,104,368. Specification of Letters Patent. Patented July 21, 1914.

Application filed September 11, 1913. Serial No. 789,267.

To all whom it may concern:

Be it known that I, FREDERICK MAUSSNER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Interlacing Curled Hair, of which the following is a specification.

My invention relates to a machine for interlacing curled hair and particularly relates to a machine in which the curled hair is interlaced by the insertion of needles, provided with barbs, which latter, upon being withdrawn, pull a few strands of hair through the block or mass of loose curled hair and thus interlace the hair so that the block will retain its shape after it is removed from the machine.

The object of my invention is to make a machine which will be of sufficient size to produce a mattress for a full size bed, and also cushions and pads of smaller dimensions, a further object of my invention is to so construct the machine that the block of curled hair may be passed under the row of needles any desired number of times to either loosely or tightly interlace the hair forming the same; a further object is to provide various adjustments in the machine whereby the height of the block of hair may be changed to cause the needles to pass entirely through the block or only a short distance into the same, and a further adjustment is also provided whereby the length of the stroke of the needles may be changed so that they will enter the block of hair any desired distance and be withdrawn any desired distance for the purpose of interlacing only the surface of the block of hair; and also for giving the surface of the block of hair either a smooth or rough finish; these together with various other novel features of operation and construction constitute my invention which will be hereinafter more fully described and claimed.

Referring to the accompanying drawings:—Figure 1, is a side elevation of my improved machine, with the driving pulley removed; Fig. 2, is a plan view of the machine; Fig. 3, is an end view of the machine, with the frame, for holding the block of hair, removed; Fig. 4 is a longitudinal section on line 4—4 Fig. 2, showing the carriage in a different position; Fig. 5, is a transverse section on line 5—5 Fig. 4; Fig. 6, is a transverse section on line 6—6, Fig. 4. Fig. 7, is a vertical section on line 7—7, Fig. 5; Fig. 8, is a transverse vertical section on line 8—8 Fig. 7; Fig. 9, is a view similar to Fig. 7, showing the parts in a different position; Fig. 10, is a plan view (drawn in a larger scale), of the frame for holding the curled hair; Fig. 11, is an end view of the frame as shown in Fig. 10, and Fig. 12, is a sectional view as on line 12—12, Fig. 10.

In the drawings in which like references refer to like parts; 1 and 2 represent the side members and 3 and 4 the end members of a rectangular frame, supported upon legs 6. Secured to the side members 2 and 3 are posts 7 and 8, which form bearings for the main shaft 10, provided with tight and loose pulleys 12 and 13 and a balance wheel 14. Secured to the main shaft 10 are two eccentrics 15 and 16, to which is connected the needle bar 18, to which is imparted a vertical reciprocating motion as the main shaft 10 is rotated.

The needle bar 18 works in guides formed by the parts 7 and 8, which are provided with central vertical slots 20, into which the ends of the needle bar 18 enter. The needle bar 18 carries a row of needles 21, which enter vertical apertures formed in the needle bar 18 and said needles 21 are secured by set screws 22. The needles 21 are provided upon their lower ends with barbs 23 as shown in Figs. 1 and 4.

The loose curled hair is spread upon one section of a frame 25. Sufficient hair is used so that the mattress or pad when compressed and finished will be the desired thickness. The upper section 26 of the frame 25 is placed over the mass of hair, the upper and lower sections 26 and 27 forming the frame 25, are fastened together and the frame is then placed upon the carriage of the machine.

The frame 25 consists of the said upper and lower sections 26 and 27. Each of the said sections is formed of bars or tubes 29, placed parallel with each other and a sufficient distance apart to allow the needles 21 to pass between them, as shown in Fig. 5. The end bars 30 of each section of the frame 25 are made of two plates 32 and 33, more clearly shown in the enlarged views Figs. 10, 11 and 12.

The plates 32 and 33 forming the end bars 30, are secured together by fastening devices 35. The inside plate 33 is provided with a series of apertures to loosely hold the ends of the tube 29, which latter abut against the solid plate 32. The end bars 30 forming the ends of the section of the frame 25, are held together by long rods or bolts 37, which extend through the tubes 29, and the nuts 38, upon the ends of said rods 37, clamp the end bars 30 sufficiently to hold the ends of the tubes 29 in said bars 30. The ends of the rods 37 project beyond the bars 30 and are adapted to have the links of the chains 40 placed over them. Said chains 40 hold the upper and lower sections of the frame 25 together and form a convenient means for adjustably connecting the said sections together to provide for various thicknesses of the material which is held between them.

Bolts 41 are provided in the end bars 30 of the sections of the frame for the purpose of securing the hooks of a chain hoist for lifting the frame on or off the machine. The end bars 30 are provided at either end with apertures 42 to receive the pins 43, which hold the upper and lower sections of the frame 25 in vertical alinement, so that the needles 21 may freely pass entirely through both sections of the frame without striking the tubes 29.

The carriage 45 for receiving the frame 25, consists of the side angle plates 46 and 47, which are spaced the proper distance apart to allow the ends of the bars 30 of the sections of the frame 25 to rest upon them. Said angle plates 46 and 47 are secured to the cross pieces 49, as shown in Fig. 3, which cross pieces 49 rest upon the longitudinal sills 50, secured to the axles 51, which are provided with the wheels 52.

The carriage 45 is mounted upon tracks 55 and 56, which extend the entire length of the machine and are of sufficient length to allow the carriage 45 to pass beneath the needles 21 and also to be moved to either end of the machine to permit the frame 25 to be lifted on or off the carriage. At each end of the tracks 55 and 56 are shafts 58 and 59, on which are mounted sprocket wheels 60, over which pass the endless sprocket chain 62, each end thereof being secured to the carriage 45, so that the latter may be moved along the tracks by the said sprocket chain. The shaft 58 at one end of the tracks is rotated by the sprocket wheels 64 and 65, which are driven by sprocket chains 66, from the larger sprocket wheels 67 on the shaft 70, mounted in the side members 2 and 3 of the frame of the machine.

The shaft 70 is rotated by a friction clutch, consisting of the wheel 72, secured to the shaft 70. The wheel 72 is provided with an annular groove 73, formed in its face, into which fits one face of a fiber friction block 75 having the surfaces thereof beveled to correspond to the surface of the flanges of the wheel 72 forming the annular groove 73. The said friction block 75 is loosely pivoted upon a shaft 76 extending between the arms 77 and 78 which are loosely pivoted on the shaft 70 at either side of the friction wheel 72. The arms 77 and 78 are reciprocated by the rod 80, (see Figs. 1, 3 and 5). The rod 80 is connected with an arm 81 pivotally mounted in the bearing 82 and provided at its free end with a roller 83, which rides upon a cam 85, secured upon the main shaft 10. As the cam 85 rotates, a reciprocating motion is imparted through the rod 80 to the arms 77 and 78 and as the friction block 75 is so pivoted that it will lock with the friction wheel 72, on the upward stroke of the arms 77 and 78, and release itself on the downward stroke of said arms. An intermittent rotary motion is imparted to the shaft 70, and the carriage 45 will be slowly moved along the tracks beneath the needles 21, as the latter are reciprocated vertically by the eccentrics 15 and 16, upon the main shaft 10.

When the carriage 45 has traveled under the needles 21, and the latter have interlaced all the hair in the frame 25, the machine is stopped with the needles 21 in the raised position. The friction block 75 is turned upon its pivot shaft 76, away from the friction wheel 72. The shaft 70 may then be turned, by means of the hand wheel 87, in the reverse direction to move the carriage 45 back to the starting point and the frame 25 removed from the machine, or again passed under the needles, as desired.

The tracks 55 and 56 are supported upon six cams 88, secured upon the cam shafts 89, 90 and 91 loosely mounted in the side members 2 and 3. The shafts 89, 90 and 91, carrying the cams 88, have secured thereon sprocket wheels 92 over which pass sprocket chains 93 for simultaneously rotating the shafts 89, 90 and 91. The cam shaft 89 is provided with a gear wheel 95, which meshes with a pinion 96, on a stud shaft 97, which is operated by a handle 98. A pawl 99 and ratchet-wheel 100 is provided to hold the shaft 89 from rotating by the action of the weight upon the cams 88. By turning the handle 98, the cam shafts 89, 90 and 91 upon which the cams 88 are mounted, are simultaneously rotated and the tracks are raised or lowered, so as to bring the frame 25 to the desired height in relation to the needles to cause them to enter the block of hair in the frame 25, a short distance or to pass entirely through the block of hair as desired.

Vertical guide rods 102 are provided to prevent any lateral movement of the tracks 55 and 56 and to hold them upon the cams 88. The guide rods 102 are secured to the

tracks and the lower ends thereof slide in guides 103, secured to the end members 2 and 3 of the machine.

Rollers 105 and 106 are provided to press down upon the upper section 26 of the frame 25, and compress the block of hair to the desired thickness. Said rollers 105 and 106 are mounted in end bearings 107, secured upon the side members 2 and 3. Said bearings 107, are provided with movable heads 108, in which are loosely mounted the ends of the rollers 105 and 106. The movable heads 108 are adjusted vertically in the bearings 107 by means of threaded shafts 109, which pass through threaded apertures in the top plates 110 of the bearings 107. The heads upon the lower ends of the threaded shafts 109 turn loosely in the movable heads 108, as shown in Fig. 6. The threaded shafts 109 at the opposite ends of the rollers 105 and 106 are connected by a sprocket chain 112, which passes around sprocket wheels 113, secured upon the threaded shafts 109. When one of the shafts 109 is rotated by means of the hand wheel 114, the sprocket chain 112 will turn the opposite shaft 109 and the roller will be maintained in a horizontal position. The roller 105 is provided with corrugations 115, which fit over the parallel tubes 29 of the upper section 26, of the frame 25, so as to insure the said tubes 29 being in proper alinement to allow the needles 21 to pass between them.

The eccentrics 15 and 16 are constructed as shown in the enlarged views, Figs. 7, 8 and 9. The eccentric straps 116 are connected by adjustable rods 117, with the needle bar 18. Each eccentric consists of an inner disk 118 and an outer disk 119. The inner disk 118 is eccentrically mounted upon the shaft 10, to which it is secured by a set screw 120, located upon the hub 121, formed upon the inner disk 118. The outer disk 119 has a circular opening formed therein to receive the inner disk 118. Said opening is arranged eccentrically to the outer periphery of the disk 119. The inner disk 118 is provided with a flange 125, which overlaps a flange 126 forming part of the outer disk 119. The flange 125 upon the inner disk 118 is provided with two oppositely disposed apertures to receive the bolts 127 and the flange 126 of the outer disk 119 is provided with a series of oppositely disposed apertures to receive said bolts 127. By removing the bolts 127, the outer disk 119 may be rotated about the inner disk 118, so as to change the throw of the eccentric, as shown in Figs. 7 and 9. In the former the disks 118 and 119 are shown bolted together so as to give the greatest movement, as indicated by dotted lines and in Fig. 9 the said disks are adjusted to give the least possible movement as indicated by the dotted lines.

By reducing the throw of the eccentrics the needles will enter the block of hair only a short distance and be withdrawn but a short distance, for the purpose of interlacing the outer surface only of the block of hair. When a rough finish is desired upon the materials the needles are withdrawn upon each movement sufficiently to free themselves of the strands of hair and the finished materials will have a soft, loosely interlaced surface, and when the needles are withdrawn but a short distance above the block of hair, the needles will not free themselves of the hair, but will carry it back into the mass of hair and tightly interlace the surface making it hard and closely interlaced.

The cam 85 is adjustable upon the shaft 10, so that said cam may be set to operate the friction clutch and advance the carriage when the needles are in the raised position, so as not to break the needles. Said cam 85 may be set so as to advance the carriage just at the moment when the needles are beginning the downward stroke which will cause the needles to more readily release the strands of hair.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. A machine of the character described, having reciprocating needles in combination with a frame consisting of upper and lower sections, each section formed of a series of parallel bars for confining the material to be treated and allowing the needles to pass through said sections, fastening devices at each end of the frame for holding the upper and lower sections of the frame together and means for moving the frame into the action of the needles.

2. A machine of the character described, having reciprocating needles in combination with a frame consisting of upper and lower sections, each section formed of a series of parallel bars for confining the material to be treated and allowing the needles to pass through said sections, end plates into which said parallel bars are loosely inserted, longitudinal bolts to hold the end plates upon the ends of the parallel bars and means for moving the frame into the action of the needles.

3. A machine of the character described, having reciprocating needles in combination with a frame consisting of parallel bars to compress the block of material to be treated, a roller for compressing the bars forming the frame, corrugations formed upon said roller to engage the bars of the frame and means for moving the frame within the action of the needles.

4. A machine of the character described, having reciprocating needles in combination with a frame for containing the material to be treated, a carriage, tracks, a sprocket chain having the ends attached to the carriage,

sprocket wheels over which said sprocket chain passes located beyond the length of the travel of the carriage, means for imparting motion to the sprocket chain, a friction clutch, a connection between said clutch and one of said sprocket wheels and means for operating the clutch to impart an intermittent movement to the sprocket chain.

5. A machine of the character described, having reciprocating needles in combination with a shaft for operating the needles, a cam on said shaft, an arm operated by said cam, a rod attached to the arm, a shaft mounted in the side members of the machine, a friction clutch upon the last mentioned shaft, said rod connected with said friction clutch to intermittently rotate the same, a hand wheel on said last mentioned shaft, a sprocket chain operated by said last mentioned shaft, a carriage to which said sprocket chain is attached and tracks upon which said carriage is mounted.

6. In a machine of the character described, the combination of side and end members forming a supporting frame, cam shafts mounted in said frame, cams on said shafts, tracks upon said cams, gear wheels for turning one of the cam shafts, a handle on one of the gear wheels, sprocket chains between the cam shafts, a carriage, a frame upon said carriage, an endless sprocket chain attached to the carriage, a shaft operating the endless sprocket chain, a friction clutch to operate the last mentioned shaft, a cam to operate the friction clutch, a shaft on which the last mentioned cam is mounted, eccentrics upon said last mentioned shaft, a needle bar connected with said eccentrics, needles secured in said needle bar, rollers mounted in the frame of the machine, threaded shafts to adjust said rollers, and means for connecting the threaded shafts for simultaneously moving the ends of the rollers.

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

FREDERICK MAUSSNER.

Witnesses:

S. HORACE MYERS,

C. H. HETT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."