M. R. BIRMINGHAM.

PILE FABRIC LOOM.

APPLICATION FILED JULY 19, 1920.

1,407,121. Patented Feb. 21, 1922.

2 SHEETS—SHEET 1.

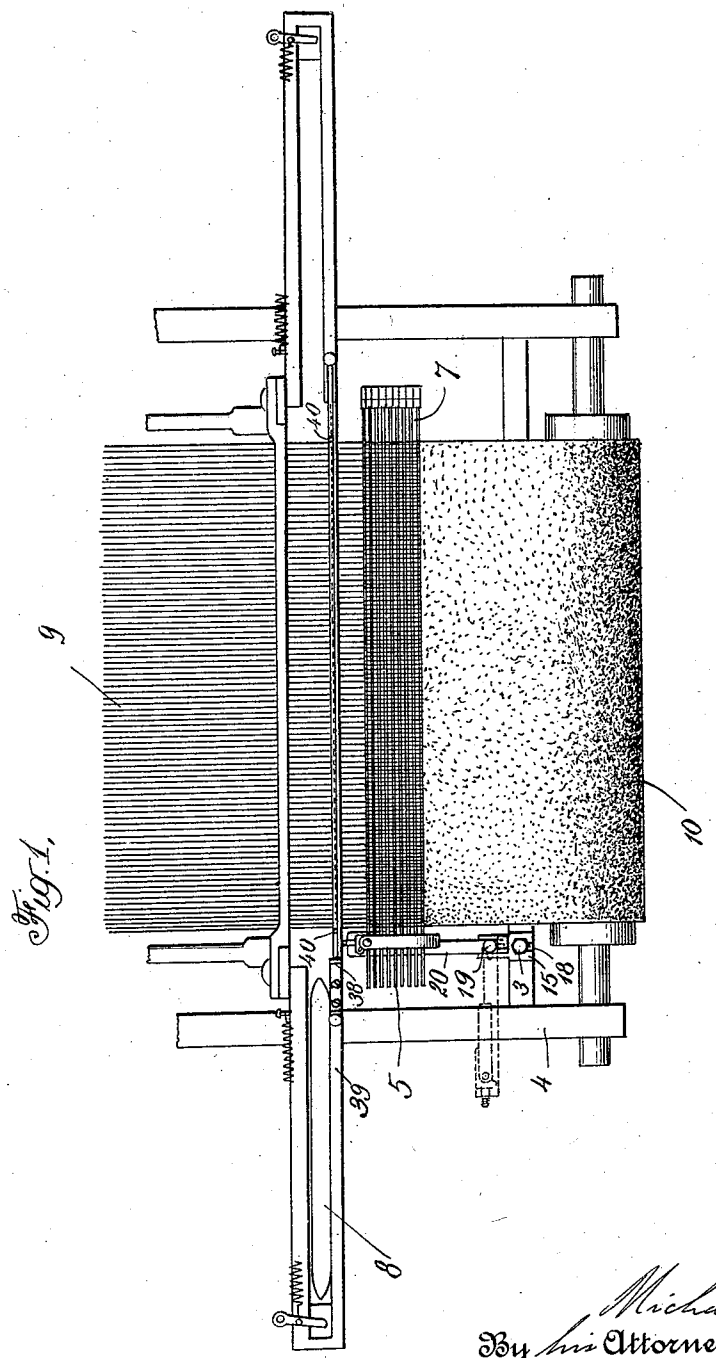


Fig. 1.



Fig. 2.

Inventor

Michael R. Birmingham

By his Attorney

E. W. Marshall

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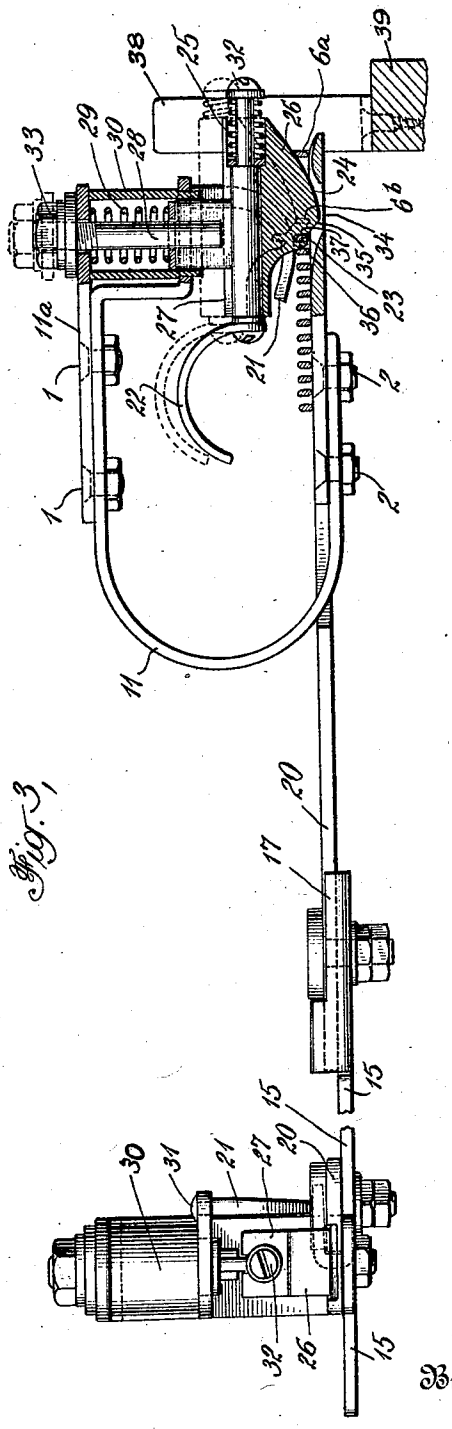


Fig. 3.

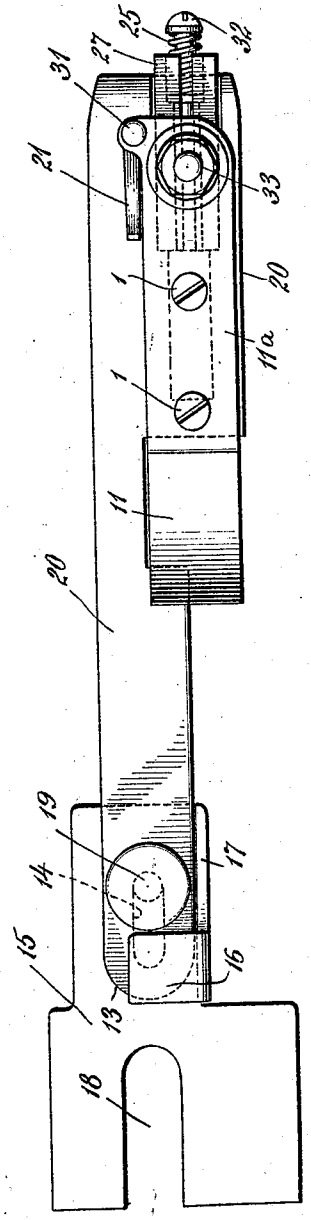


Fig. 4.

Inventor

Michael R. Birmingham

By his Attorney

E. W. Marshall

UNITED STATES PATENT OFFICE.

MICHAEL R. BIRMINGHAM, OF YONKERS, NEW YORK.

PILE-FABRIC LOOM.

1,407,121. Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed July 19, 1920. Serial No. 397,174.

To all whom it may concern:

Be it known that I, MICHAEL R. BIRMINGHAM, a citizen of the United States, and resident of 242 Riverdale Avenue, Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Pile-Fabric Looms, of which the following is a specification.

My invention relates to improvements in textile machinery and has particular application to looms of the type used in connection with the manufacture of pile fabrics.

An object of my invention is to provide a neat, simple and efficacious attachment or device for holding the pile wires in position before they are securely seized by the weave of the fabric itself.

Another object is to provide a device by which the pile wire is positively held in proper edge position during the desired period of time and is grasped by an auxiliary means during its release to facilitate the release and prevent disturbance of the position of the wire at that time.

A further object is to keep the wires properly spaced. With the foregoing and other objects in view which will become apparent as the description proceeds, my invention resides in the combination and arrangement of parts and in the details of construction, with due regard for mechanical equivalents, described in the specification, illustrated in the drawings, and particularly pointed out in the appended claims, it being understood that I do not limit myself to the precise embodiment of the invention herein disclosed and changes can be made within the scope of what is claimed without departing from the spirit of the invention. I intend no limitations other than those imposed on me by the appended claims.

In the drawings—

Figure 1 illustrates a portion of a pile fabric loom, showing a device embodying my invention.

Figure 2 illustrates a pile wire of a type commonly used.

Figure 3 illustrates in side elevation one form of attachment embodying the principles of my invention, parts being shown in section.

Figure 4 is a plan view of the device illustrated in Figure 3.

Similar reference numerals relate to similar parts throughout the several views.

In Fig. 1, 10 indicates a pile fabric being manufactured, 9 indicating longitudinal fibres of the fabric and 8 indicating a shuttle carrying transverse fibre in the well known manner.

7 indicates a series of pile wires 6 in position, woven in the carpet, each wire having a knife end 5. As is well known in the art, it is essential that these knife edges be held in correct cutting position so that when the wires are withdrawn the fibres will be properly severed, the resulting loose ends giving the pile effect to the fabric.

In carrying out my invention I provide a device or attachment for cooperation with the pile wires. The device is supported on an arm 20 which may be pivoted at 19 to a plate 15 which is secured to a part of the loom frame 4 as by a bolt 3 arranged to pass through a slot 18 in the fixed member 15. By means of such a pivoted arrangement, to be further described in detail, the device may be swung to one side, as shown in the dotted line position of the device (Fig. 1.), when putting in a heading and taking out wires, for example. An upturned edge member 17 on the plate 15 acts as a guide and stop for the member 20. An overlapping guard 16 holds the pivoted member 20 from riding over the upturned edge member 17. At one end of the arm 20 is a slot 14 through which is passed a pivot or bolt 19 for securing the arm to the plate member 15. The outer end of the member 20 is rounded as at 13 on an arc concentric with the end of the slot 14.

In the position shown in the drawing (Fig. 4) motion of the pivoted member 20 with respect to the fixed member 15 except as hereinafted described, is prevented by the arrangement of the stop 17, the guard 16, the head of the pivot 19 and the pivot and slot construction. If the member 20 is pulled out (to the right, as illustrated) so that the pivot 19 is in the outer end of the slot 14, the member 20 then may be swung in one direction, the rounded end 13 clearing the edge 17. The stop 17, however, acting against the edge of the member 20 prevents the member 20 being swung in the other direction.

At the other end of the pivoted arm or member 20 is mounted as by bolts 2, 2 a support or bracket member 11. An extension piece 11^a is shown bolted as at 1, 1, to the support 11. This extension together with a

bent end of the support forms a yoke in which a cylinder 30 is mounted. Passing through cylinder 30 is a guide rod 28 carrying a T-shaped head 27. A coiled spring 29 in the cylinder surrounds the guide rod and presses against the head yieldingly holding it in depressed position.

Slidably secured to the T-head 27 is a foot 26, a spring 25 tending to oppose such movement. This foot has a cam surface 24 on the forward lower edge; a wire holding notch 23 or slot at its heel, and a short and steep cam surfaces 35 connecting the notch and cam surface 24.

A finger grip 22 on the head 27 is arranged for manually lifting the head 26 when desired. On the far side of the clamp, as illustrated (Fig. 3) is an auxiliary holding member 21 fixed in position on the support member 11 as by riveting at 31 (Fig. 4).

A bolt 32 threaded into the head 27 provides for adjustment of the tension of the spring 25 and a nut 33 threaded on the rod 28 provides for adjustment of the tension of the spring 29.

The arm or member 20 at its forward end serves as a track for supporting a plurality of pile wires and has a recess or opening 34 into which the lower part of the cam face 24 may enter in order to have a part of the foot below the top of the track on member 20 along which the pile wires ride.

In operation, a pile wire 6^a rides along the track on the member 20 and by reason of the cam edge 24 of the foot, the latter is lifted against the pressure of the spring 29, the wire bridging the opening 34. The foot takes the dotted line position of Fig. 3 when the pile wire reaches the position 6^b.

On further backward movement of the pile wire, the sloping cam face 35 of the foot 26 rides on the pile wire forcing the foot forward (to the right as shown) against the comparatively light tension of the spring 25, the upright face 37 of the notch 23 straightening the wire into edge position.

The pressure of the resilient member 29 then forces the foot down and the pile wire enters the holding slot 23, the foot moving backward to normal position. The spring 25 keeps the clamp head in normal position so that the pile wire will enter the holding slot 23.

When a second wire is fed into the device, the wire previously in the slot 23 is held from upward movement by an abutment 21. When the clamp head moves forward and down, a back face 36 of the clamp head comes down in front of the discharged wire and presses same along (to the left) when the foot itself moves back under the action of spring 25. In this way the clamp head acts to aid in spacing the wires equally along the support 20, while each is held in proper edge position by the clamp slot 23 and later in the travel, by the abutment 21.

As the wires travel backward with the fabric, they are released from the auxiliary clamp 21 and are free to be pulled out as desired.

As will be apparent to those skilled in the art, the wires are fed into the holding device by the action of the loom parts. The reed posts 40, 40 project upward from the crossbar 39 and engage the pile wire to force it forward. With my device an auxiliary post 38 is also used to engage the pile wires on the outer side of the clamp thereby preventing strain on the wire as it passes through the clamp. The post 38 comprises, in this embodiment of my invention, an angle iron bolted or otherwise secured to the crossbar 39.

What I claim is:

1. The combination with the pile wires of a pile fabric loom, of a wire supporting track, a foot normally holding the free end of a pile wire in a fixed position on the track, means for elevating the foot to release the held wire, means permitting a forward movement of the whole wire holding part of the foot while the foot is in its elevated position, and resilient means to restore the foot to its normal position.

2. The combination with the pile wires of a pile fabric loom, of a wire-supporting track, a foot mounted for movement toward and from the track, means at the heel of the foot for holding a pile wire in a definite position on the track, an incline from said means to the bottom of the foot, a recess in the track for receiving the lowermost part of the foot, means for elevating the foot to release the held wire comprising a pile wire movable between the track and bottom of the foot, and means permitting a forward movement of the foot as the incline rides down on the movable pile wire.

3. The combination with the pile wires of a pile fabric loom, of a wire-supporting track, a foot mounted for movement toward and from the track, a notch at the heel of the foot for holding a pile wire in a definite position on the track, an incline from one side of the inside of the notch to the bottom of the foot, an inclined surface on the foot forming a narrow edge at the opposite side of the notch, means for elevating the foot to release the held wire comprising a pile wire movable between the track and bottom of the foot, and means permitting a forward movement of the foot as the incline rides down on the movable pile wire.

4. The combination with the pile wires of a pile fabric loom, of a wire-supporting track, a foot mounted for movement toward and from the track, means at the heel of the foot for holding a pile wire in a definite position on the track, an incline from said means to the bottom of the foot, a recess in

the track for receiving the lowermost part of the foot, means for elevating the foot to release the held wire comprising a pile wire movable between the track and bottom of the foot, and means spacing the released wire from the wire holding means.

5. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a fixed position on the track, a foot-supporting bracket secured to the track, and slidable connections between the bracket and foot.

6. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a definite position, a foot-supporting bracket secured to the track, a spring between the bracket and foot for urging the foot toward the track, and means permitting the foot to move parallel to the track.

7. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a definite position, a bracket secured to the track, a connection between the bracket and foot permitting movement of the latter toward and away from the track, means in the connection for pressing the foot toward the track, and means permitting the foot to move transversely with respect to said connection.

8. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a definite position, a bracket secured to the track, a connection between the bracket and foot permitting movement of the latter toward and away from the track, means in the connection for pressing the foot toward the track, and a member overlying the track at one side of the foot and secured to the bracket.

9. The invention as in claim 7, and wire straddling means at the bottom of the foot.

10. In combination with a pile-wire supporting-track, of a foot supported in a definite relation thereto and having a notch in the heel of the foot for straddling a pile wire means permitting a longitudinal movement of the foot, a cam surface extending downwardly and rearwardly and terminating short of the notch arranged to be engaged by a pile wire to raise the foot and an inclined surface inclined in the opposite direction to the cam surface joining the notch with the bottom of the cam surface and arranged to slide down over a pile wire to impart a forward movement to the foot.

11. The combination with a foot adapted to hold a pile wire in a fixed position, of a head to which the foot is pivotally and slidably secured, resilient means opposing the sliding movement of the foot, a guide post rising from the head, means slidably supporting the post, and resilient means opposing relative movement between the post and its supporting means.

12. The combination with a foot adapted to hold a pile wire in a fixed position, of a head to which the foot is pivotally and slidably secured, resilient means opposing the sliding movement of the foot, a guide post rising from the head, means slidably supporting the post, and a finger hold secured to the foot for moving the same against the tension of the said resilient means.

13. In an attachment for pile fabric looms, a fixed frame member, a member pivotally attached thereto, a support member mounted on said last named member, a T-shaped bracket yieldingly mounted on said support member, a clamp head slidably mounted on said bracket and a slot in said head adapted to engage a pile wire.

14. The combination with the pile wires of a pile fabric loom, of a wire supporting track, a foot for holding the free end of a pile wire in a fixed position on the track, means for releasing the held wire comprising a pile wire movable between the track and foot to elevate the latter, and an abutment in spaced relation to the track for preventing the underlying pile wires from rising as the foot is elevated.

15. The combination with the pile wires of a pile fabric loom, of a wire-supporting track, a foot normally holding the free end of a pile wire in a definite position on the track, means for elevating the foot to release the held wire, means permitting a forward movement of the foot while in its elevated position, and an abutment in spaced relation to the track for preventing the underlying pile wires from rising as the foot is elevated.

16. The combination with the pile wires of a pile fabric loom, of a wire-supporting track, a foot mounted for movement toward and from the track, means at the heel of the foot for holding a pile-wire in a definite position on the track, an incline from said means to the bottom of the foot, a recess in the track for receiving the lowermost part of the foot, means for elevating the foot to release the held wire comprising a pile wire movable between the track and bottom of the foot, means permitting a forward movement of the foot as the incline rides down on the movable pile wire, and an abutment in spaced relation to the track for preventing the underlying pile wires from rising as the foot is elevated.

17. The combination with the pile wires of a pile fabric loom, of a wire-supporting track, a foot mounted for movement toward and from the track, means at the heel of the foot for holding a pile wire in a definite position on the track, an incline from said means to the bottom of the foot, a recess in the track for receiving the lowermost part

of the foot, means for elevating the foot to release the held wire comprising a pile wire movable between the track and bottom of the foot, means spacing the released wire from the wire holding means, and an abutment in spaced relation to the track for preventing the underlying pile wires from rising as the foot is elevated.

18. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a fixed position on the track, a foot-supporting bracket secured to the track, slidable connections between the bracket and foot, and a support to which the device is swingably connected.

19. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a fixed position on the track, a foot-supporting bracket secured to the track, slidable connections between the bracket and foot, an arm supporting the device and a support on which the arm is swingably mounted.

20. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a fixed position on the track, a foot-supporting bracket secured to the track, slidable connections between the bracket and foot, an arm supporting the device, a support on which the arm is swingably mounted and means for locking the arm to the support.

21. The combination with a pile-wire supporting-track, of a foot adapted to coact with the track for holding a pile wire in a definite position, a bracket secured to the track, a connection between the bracket and foot permitting movement of the latter toward and away from the track, means in the connection for pressing the foot toward the track, means permitting the foot to move transversely with respect to said connection, and an abutment in spaced relation to the track for preventing the underlying pile wires from moving away from the track as the foot moves away therefrom.

Signed at Yonkers, in the county of Westchester and State of New York, this 14th day of July 1920 A. D.

MICHAEL R. BIRMINGHAM.