Dec. 3, 1929. E. H. RYON 1,737,688

LOOM FOR WEAVING TERRY FABRIC

Filed Oct. 4, 1926 2 Sheets-Sheet 1

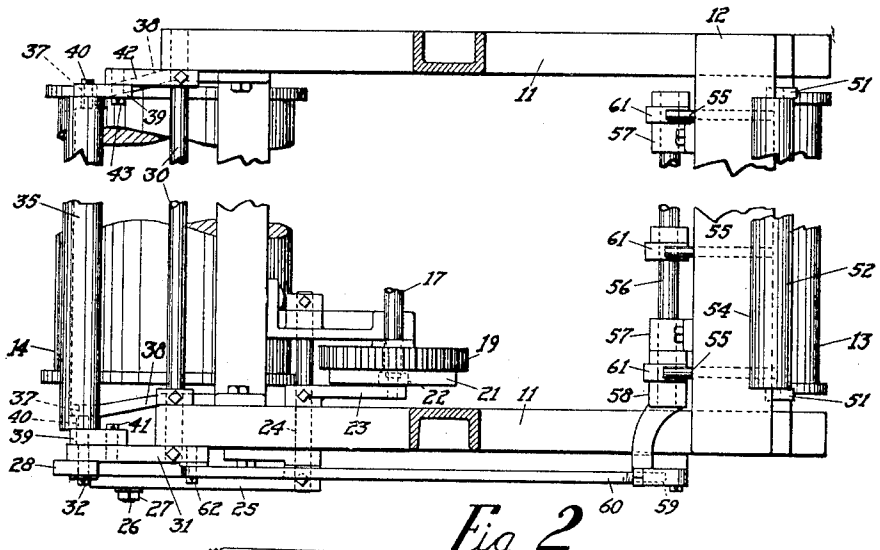


Fig. 2

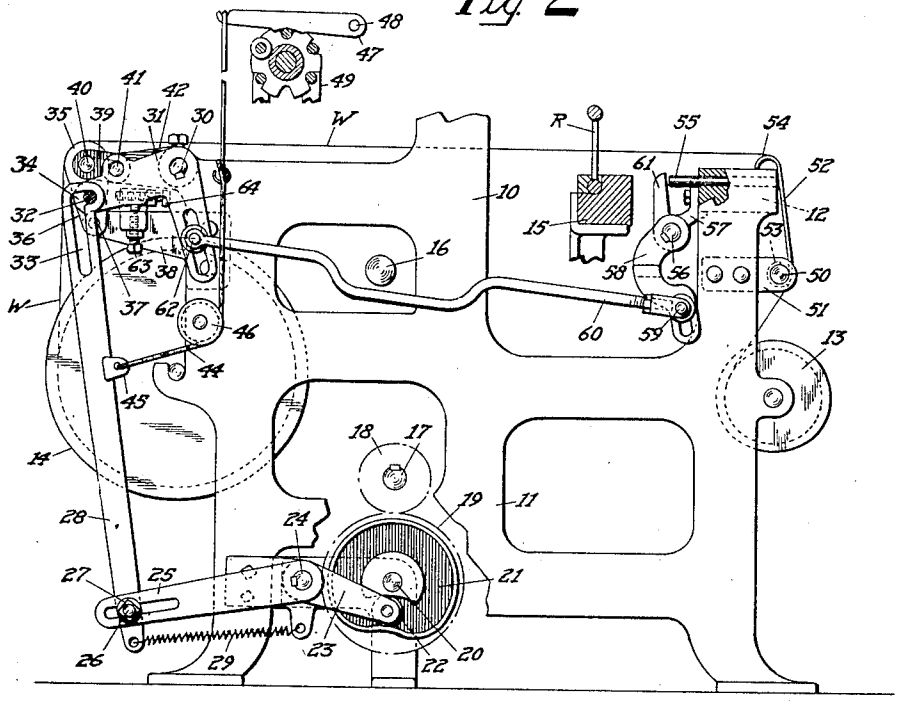


Fig. 1

Inventor
Eppa H. Ryon

Attorneys

Dec. 3, 1929. E. H. RYON 1,737,688

LOOM FOR WEAVING TERRY FABRIC

Filed Oct. 4, 1926 2 Sheets-Sheet 2

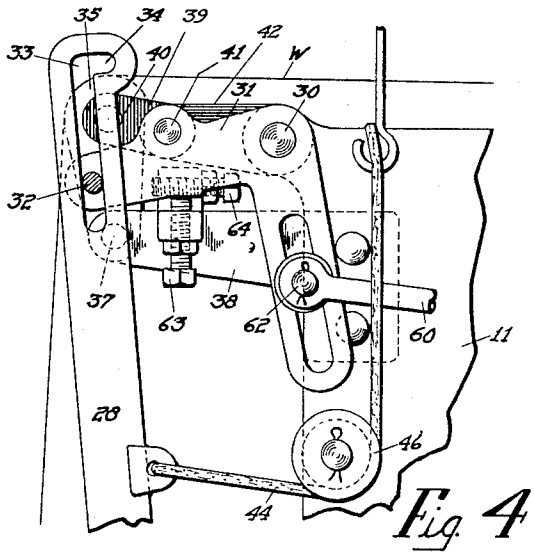


Fig. 4

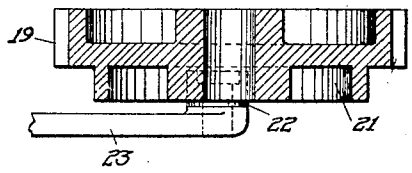


Fig. 5

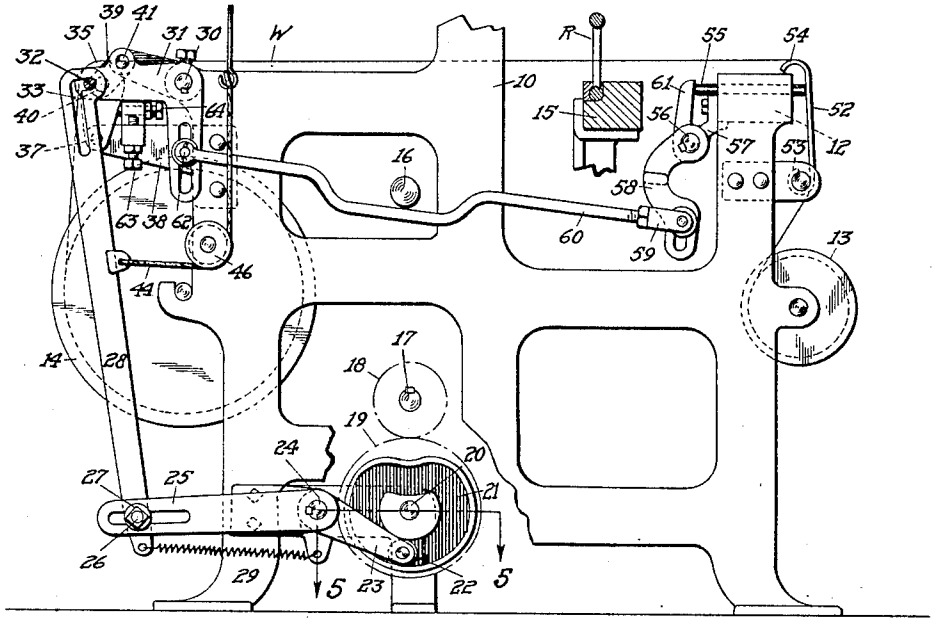


Fig. 3

Inventor
Eppa H. Ryon

Southgate Fay & Hawley
Attorneys

Patented Dec. 3, 1929 1,737,688

UNITED STATES PATENT OFFICE

EPPA H. RYON, OF PASADENA, CALIFORNIA, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

LOOM FOR WEAVING TERRY FABRIC

Application filed October 4, 1926. Serial No. 139,308.

This invention relates to looms for weaving terry fabrics and it is the principal object of the invention to provide a motion which will permit the formation of relatively high terry loops.

Much of the terry fabric which has been produced heretofore has been made on looms wherein the reed assumed two different positions when the lay was in its extreme forward position, the reed being rearward for two or three picks and being moved forwardly the third or fourth pick depending upon whether the fabric being woven was three or four pick terry. It has also been proposed to produce terry by causing the lay to move through two different ranges of movement so far as its extreme forward position is concerned, the reed being secured rigidly to the lay. I find that both of these constructions are inadequate because of the lack of strength to weave fabrics requiring relatively high pile and it is a further object of my invention to provide mechanism for moving a portion of the warp and fabric rearwardly on pile forming picks, the lay moving at all times through a fixed range of motion.

It is a more particular object of my invention to accomplish the backward and forward movement of a portion of the fabric and warp by means of a toggle joint controlled from the pattern mechanism so that the weaving of terry can be terminated and the formation of the heading begun at any desired point in the length of the fabric.

It is a further object of my invention to provide a loom of the type specified wherein the picking-out operation due to a mispick will be facilitated. To accomplish this result one of the parts of the toggle which controls the position of the whip roll can be moved manually at the time of the picking-out to facilitate this operation and also to move the cloth backwardly.

It is a still further object of my invention to provide an improved form of cloth board movable about a fixed center and movable in unison with the whip roll backwardly and forwardly.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawings wherein I have shown a convenient embodiment of my invention,

Fig. 1 is a side elevation of a loom having my invention applied thereto with the parts in position to weave a heading or on the pile forming beat of the loom, parts being in section,

Fig. 2 is a top plan view of the construction shown in Fig. 1, parts of the loom frame being in section,

Fig. 3 is a view similar to Fig. 1 but with the parts in the position they assume prior to the pile forming beat of the loom,

Fig. 4 is an enlarged detail side elevation of the controlling part of the mechanism with the parts in position for weaving a heading, and

Fig. 5 is an enlarged horizontal section on line 5—5 of Fig. 3.

Referring to the drawings it will be seen that I have provided a loom frame 10 having two loomsides 11 connected together at the forward end thereof by a breast beam 12 and supporting therebetween a cloth roll 13 and a warp beam 14. The lay 15 may be of the usual construction and moves back and forth toward and from the breast beam 12 in a fixed range of movement. There extends between the loomsides the usual top and bottom shafts 16 and 17, respectively, which are driven in timed relation. The bottom shaft is provided with a gear 18 meshing with a gear 19 rotatably mounted on a stub shaft 20, the ratio of the gears 18 and 19 determining the character of the pile fabric, in this instance gear 19 being twice the diameter of gear 18 so that the loom will have a pile forming movement every fourth pick during the time the terry is being woven.

As shown in Fig. 5 the gear 19 may have cast integrally therewith on one side a cam groove 21 which receives a roll 22 mounted on the forward end of a lever 23 secured to a rock shaft 24 mounted on the loomsides. An arm 25 fast on shaft 24 is slotted to receive a stud 26 secured in the slot in adjusted posi-

tion by means of a nut 27. An upright link 28 is pivoted on stud 26 and has the lower end thereof connected to a spring 29 the forward end of which is fixed so as to tend normally to move the upper end of the link 28 rearwardly.

A cross rod 30 is rotatably mounted in loomsides 11 and has mounted on one end thereof, preferably outside one of the loomsides, a rocking lever 31 the rear end of which is provided with a stud 32 located in a slot 33 formed in the upper end of link 28. The slot 33 is provided with a forwardly extending offset or notch 34 in which the stud 32 is located while terry fabric is being woven.

A whip roll 35 over which the warp W passes has depending arms 36 which are pivoted as at 37 to brackets 38. The forward and backward positions of the whip roll are determined by links 39 which are pivotally connected to the whip roll by gudgeons 40. One of said links is pivotally connected to the rocker lever 31 as at 41 and the link on the other side of the loom is pivotally connected to an arm 42 secured to the cross shaft 30 by a stud 43 (see Fig. 2). The pivots 41 and 43 lie at equal distances from the axis of the cross shaft 30 and the links 39 are of the same length so that a uniform motion of the whip roll is insured.

A flexible connector 44 is attached as at 45 to the link 28 and is guided around a sheave 46 upwardly to a pattern controlled lever 47 pivoted as at 48 to fixed structure (not shown) and controlled as to vertical position by a pattern chain 49. The lever 47, pivot 48 and chain 49 are shown diagrammatically and may be similar to box motion controlling levers.

The mechanism at the front of the loom for supporting the cloth comprises a rod 50 mounted on fixed brackets 51 to extend between the loomsides 11 and there is pivotally mounted on said rod a cloth guide 52 formed of sheet metal as shown in Fig. 1 with the lower portion turned around the rod 50 as at 53 and an upper rounded portion 54 over which the cloth passes. Said cloth guide is pivoted on the rod 50 and is positioned by a series of plungers 55 passing through the breast beam 12. In order to control the plungers there is provided an oscillating shaft 56 mounted on supports 57 and having one end thereof secured to a lever 58 the lower end of which has adjustable connection as at 59 with a rod 60. Said oscillating shaft has a plurality of upstanding arms 61 secured thereto, there being one arm for each plunger 55, as shown in Fig. 2. The rear end of rod 60 is adjustably and pivotally connected to the rocker lever 31 as at 62 so that the whip roll and cloth support will move together.

A stop screw 63 is located in the bracket 38 to limit downward movement of the rocking lever 31 when a heading is being woven and a second stop screw 64 is positioned to engage the arm 36 to limit forward movement of the whip roll 35.

In operation the bottom shaft 17 makes a complete revolution every second pick of the loom and causes the cam 31 to complete a revolution every four picks. This results in a down motion of link 28 every fourth pick, a position corresponding to that shown in Fig. 1. When in this position the pivots 30, 40, and 41 will be practically in a straight line so that the toggles of which links 39 form a part will be practically straight, a condition which corresponds to the rearmost location of the whip roll 35 and arms 61. The cloth support 52 is therefore free to move rearwardly and the warp and cloth are moved positively toward the reed R by the action of the toggle.

On the next pick when the position of the cam lever 23 has been shifted to that shown in Fig. 3 the link 28 will have been raised so that the whip roll 35 will now be in its foremost position with the arms 61 pushing the plungers 55 forwardly. Said plungers carry the cloth support 52 forwardly and the fell of the cloth or the last pick which was beaten into the fabric will lie forwardly of the extreme forward position of the reed R. The parts will remain in this position (shown in Fig. 3) for three picks, after which they will again return to the position shown in Fig. 1 so that the three picks of filling laid when the cloth was in forward position will bind the pile warps and cause them to loop to form terry as said three picks are moved rearwardly by the action of the whip roll 35.

When the weaving of terry is to be stopped to weave a heading the lever 47 will be raised by the pattern chain 49 to cause the stud 32 to move out of the notch 34 and the link 28 will move up and down idly without affecting the position of the whip roll and cloth support. It is to be understood that the moving of the link 28 from the operative to the inoperative position indicated in Fig. 4 comes at a time when the stud 41 is below the line joining the axis of the whip roll and the cross shaft 30 so that the whip roll can be locked in rear position. Screw 63 engages lever 31 to limit downward movement thereof, thus assisting in holding the parts in locked position.

From the foregoing it will be seen that I have provided a very strong and durable mechanism for moving a portion of the warp and cloth relatively to the reed in order to form terry, the motion including a toggle joint operable under control of the pattern mechanism by a regularly moving cam which positively raises and lowers the link 28 so that the position of the fell of the cloth is always definitely located, this position being accomplished without the use of springs or other yielding devices which have been proposed heretofore but which are uncertain in

placing the fell of the cloth. It will furthermore be seen that I have provided an improved form of cloth board the lower end of which is firmly attached to fixed structure and the upper end of which is movable to accommodate the pile forming operation of the loom, the cloth board serving to direct the cloth to the take up roll whether terry or plain fabric is being woven. It will further be seen that by breaking the toggle by hand the whip roll can be moved forwardly to facilitate the withdrawing of mispicks, the ability to release the whip roll being independent of the position of the cam 21.

Having thus described my invention, it will be apparent that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention, and I do not wish to be limited to the details herein disclosed but what I claim is:

1. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, a whip roll for the warp, a cloth board for the woven fabric, and means defining a toggle joint operatively connected to the loom frame and the whip roll to move the latter rearwardly positively on selected beats of the loom.

2. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, a whip roll for the warp, a guide for the woven fabric, means to move said whip roll and guide in unison backwardly and forwardly relatively to the fixed range of action of the lay, said means including a toggle joint a portion of which is attached to a fixed part of the loom and another portion of which is attached to the whip roll, and a member receiving a reciprocation at periodic intervals to act on said toggle joint to cause the same to move the whip roll backwardly and forwardly.

3. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, a whip roll for the warp, a guide for the woven fabric, means to cause the whip roll and guide to move in unison backwardly and forwardly relatively to the fixed range of action of the lay, mechanism defining a toggle joint a portion of which is connected to the loom and another portion of which is attached to said means, and a regularly moving device to actuate the toggle to cause said means to move the whip roll and cloth guide at periodic intervals.

4. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, a whip roll, a cloth guide, a regularly moving actuator, a toggle joint to be operated by the actuator and operatively connected to the whip roll to cause the same to move relatively to the fixed range of action of the lay, and pattern controlled means to disconnect the regularly moving means from the toggle.

5. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, a whip roll, a cloth board, a regularly moving actuator having a slot therein and a notch communicating with the slot, mechanism constituting a toggle joint interposed between a fixed part of the loom and the whip roll and having a portion to enter the slot of the actuator, said portion when in the notch serving to actuate the toggle at periodic intervals to move the whip roll relatively to the fixed range of action of the lay periodically, and pattern mechanism to move said actuator relatively to said portion to the end that the actuator may move idly with said portion in the slot and out of the notch.

6. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, a whip roll having a warp yarn engaging surface and mounted to move about an axis eccentric with respect to the said surface, a pair of links constituting a toggle joint attached in part to the whip roll and in part to a fixed part of the loom, an actuator for the toggle operatively connected to one of the links to operate said toggle periodically to move the whip roll relatively to the fixed range of action of the lay, said actuating means being movable out of actuating position with respect to the link connected thereto and one of said links being manually movable to effect a movement of the whip roll relatively to the fixed range of action of the lay.

7. In a loom for weaving terry pile fabric having a lay moving through a fixed range of action, means to move the warp backwardly and forwardly relatively to the fixed range of movement of the lay, a take-up roll for the cloth, a cloth board to direct the cloth to the take-up roll, and means movable in unison with the means for moving the whip roll to move said cloth board, said cloth board being formed of a piece of sheet metal having an upper rounded edge to receive the fabric and a pivoted support for the lower end adjacent the take-up roll.

8. In a terry loom having a lay moving through a fixed range of action, a whip roll, a cloth board for the woven cloth, means to cause the roll and board to move in unison, an actuator having positive regular movements in opposite directions during operation of the loom, connections between the actuator and roll and board to cause the actuator to move the whip roll and cloth board positively in opposite directions relatively to the range of action of the lay, pattern mechanism, and an element in said connections under control of the pattern mechanism to disconnect the actuator from the roll and board.

9. In a terry loom having a lay moving through a fixed range of action, a whip roll, a cloth board for the woven cloth means to cause the roll and board to move in unison, a

track cam having a regular motion, an operating member operatively connected at all times to the cam and moved by the latter positively in opposite directions relatively to the range of action of the lay, pattern mechanism, and means under control of the pattern mechanism to disconnect the operating member from the roll and board to render the roll and board inactive as the operating member continues to operate.

10. In a terry loom having a lay moving through a fixed range of action, a whip roll, a cloth board for the woven cloth, means to cause the roll and board to move in unison relatively to the fixed range of action of the lay, a regularly moving cam, a reciprocating operating member actuated by the cam to move positively in opposite directions, pattern mechanism, means defining a pin and slot connection between the operating member and the whip roll, to cause said whip roll and cloth board to move positively under action of the cam in opposite directions, and a device between the pattern mechanism and the means defining a pin and slot connection to render the latter inoperative to transmit motion from the cam to the roll and board, whereby the whip roll and cloth board may remain at rest while the operating member reciprocates under the action of the cam.

11. In a terry loom having a lay moving through a fixed range of action, a whip roll, a cloth board for the woven cloth, means to cause the roll and board to move in unison, a reciprocating operating member operatively connected to the cam and actuated by the latter positively in opposite directions, an operating member having a slot therein from which laterally extends a notch, pin to be received by the slot and notch and operatively connected to the whip roll, said pin normally being located in the notch to transmit motion of the cam to the whip roll and cloth board to cause the latter devices to move positively in opposite directions, pattern mechanism, and connections between the pattern mechanism and the operating member to move the latter relatively to the pin to cause the latter to register with the slot in the operating member, whereby said whip roll and cloth board may remain at rest while the operating member continues to move under influence of the cam.

12. In a terry loom having a lay moving through a fixed range of action, a whip roll, a cloth board for the woven cloth, means to cause the roll and board to move in unison, an actuating member to be reciprocated positively in opposite directions, a second member movable with the means, one of said members having a slot therein, a pin secured to the other member and adapted to occupy the slot in the first named member, pattern mechanism, means to cause the two members to move together normally to transmit the positive motion of the actuating member to the whip roll and cloth board, and connections from the pattern mechanism to one of said members to move the same relatively to the other member and cause the pin to move into the slot, whereby the whip roll and cloth board may remain at rest while the operating member reciprocates positively.

13. In a terry loom having a lay moving through a fixed range of action, a whip roll, a cloth board for the woven cloth, means to cause the roll and board to move in unison, an actuating member moving positively in opposite directions, a second member, a slot in one member extending substantially parallel to the direction of movement of the first named member, there being a notch extending laterally from the slot, a pin in the other member normally located in the notch to cause positive movements in opposite directions of the whip roll and cloth board relatively to the range of action of the lay as the operating member moves in opposite directions, pattern mechanism, and means controlled by the pattern mechanism to move the pin and member having the slot relatively to each other to move the pin out of the notch into the slotted member, whereby the roll and cloth board may remain at rest while the operating member moves positively in opposite directions.

In testimony whereof I have hereunto affixed my signature.

EPPA H. RYON.