July 18, 1944. E. R. PEDRAZZO 2,353,968

LOOM

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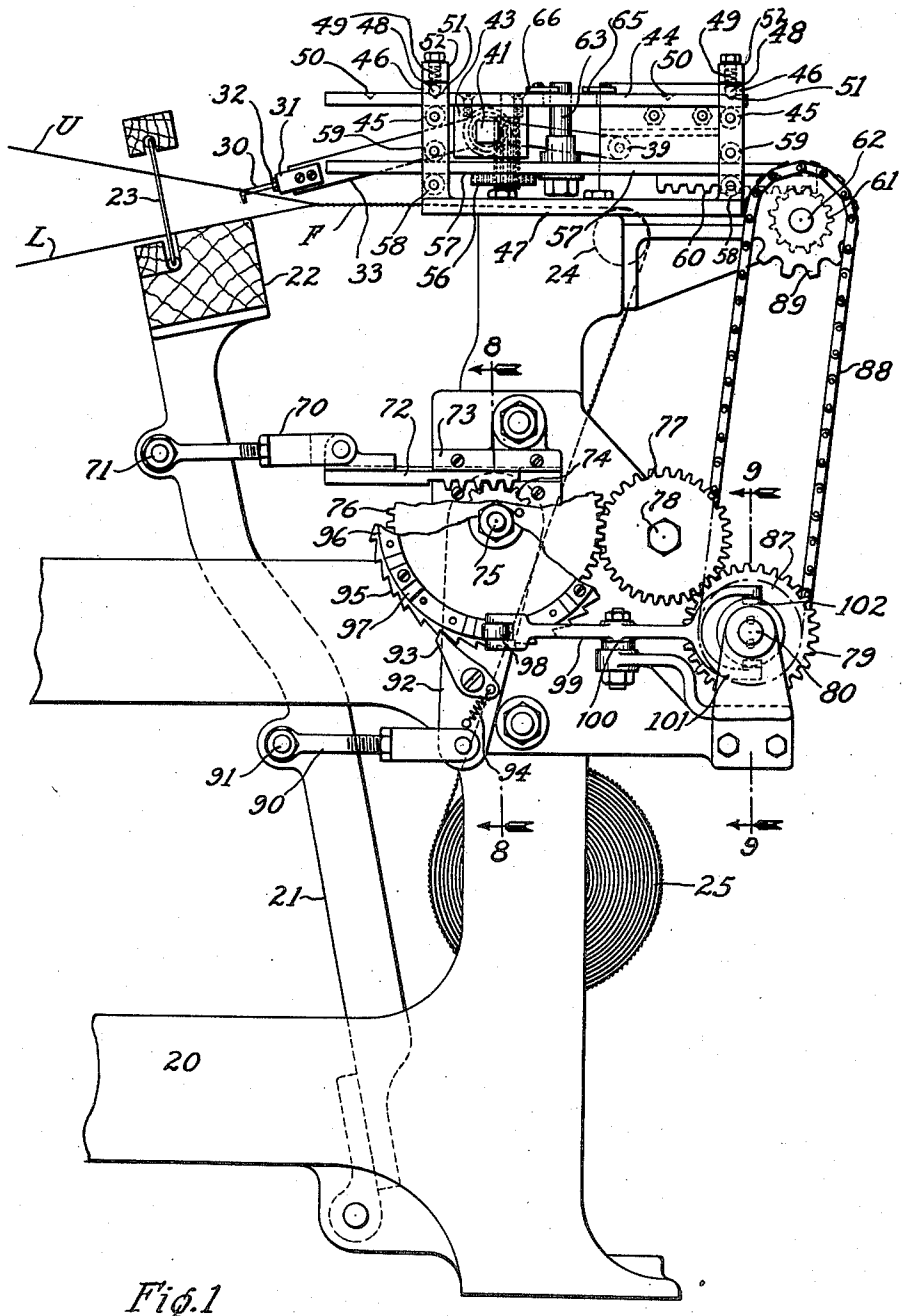


Fig. 1

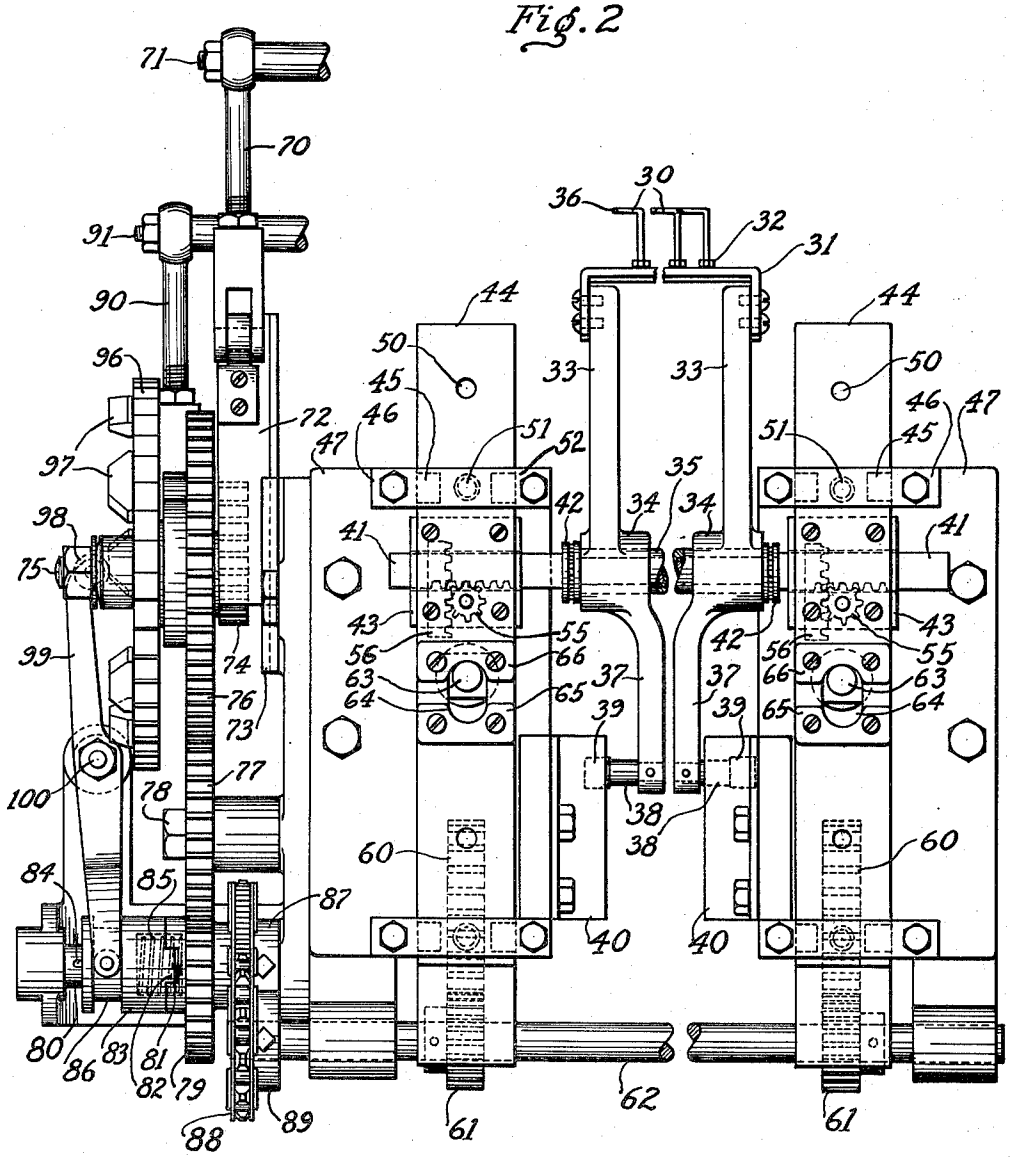
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Fig. 2



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Fig. 3

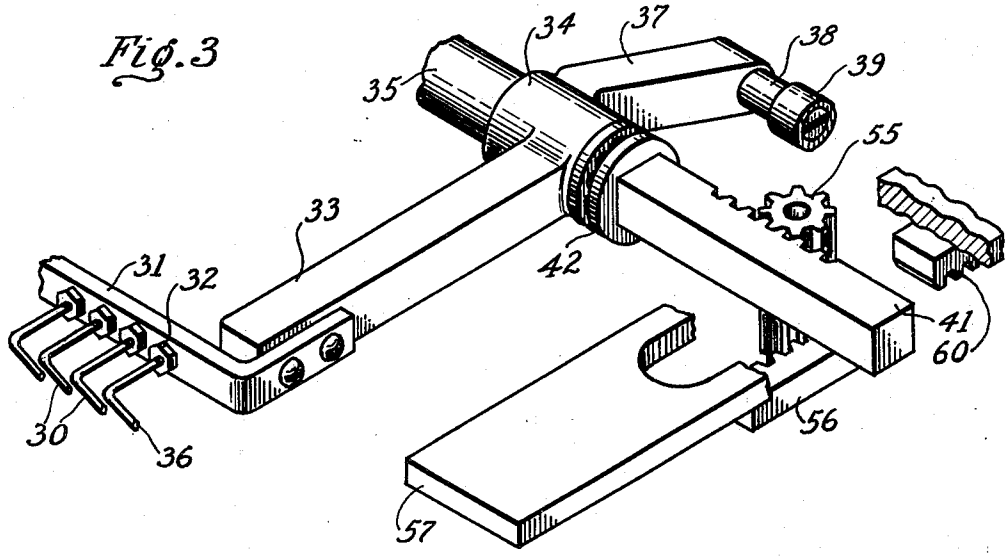
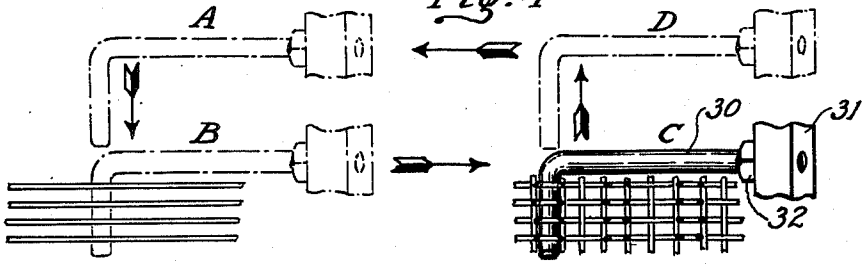


Fig. 4



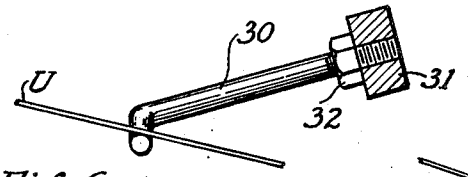


Fig. 6

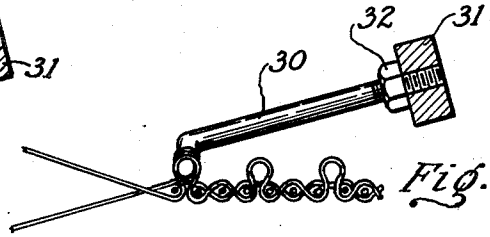


Fig. 5



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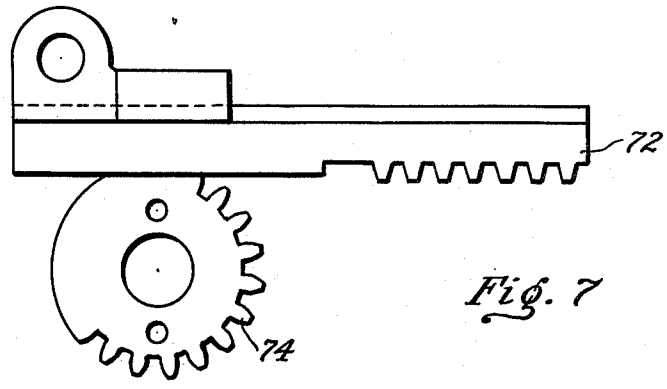


Fig. 7

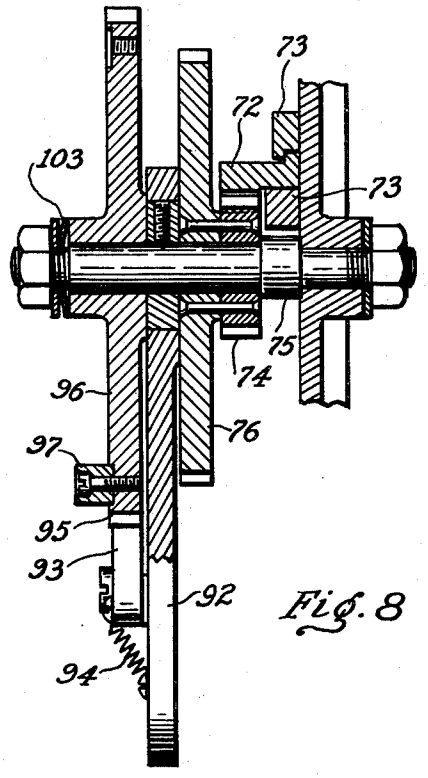


Fig. 8

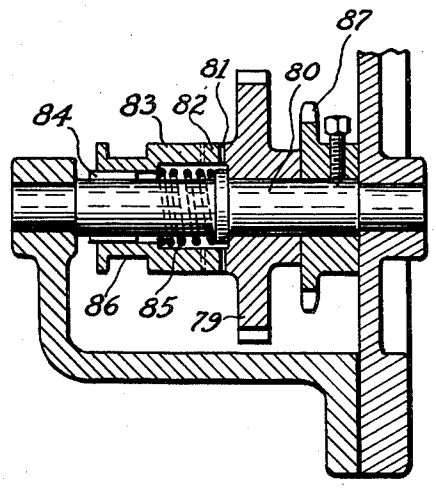


Fig. 9

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2,353,968

LOOM

Emil R. Pedrazzo, West New York, N. J.

Application April 9, 1941, Serial No. 387,599

3 Claims. (Cl. 139—25)

This invention relates to looms, and particularly to a loom attachment for adapting the loom for the manufacture of terry pile fabric.

At the present time it is customary to make terry fabric on looms built especially for this purpose.

This invention has for its salient object to provide a simple and practical attachment for standard looms so constructed and arranged that terry pile fabric can be made on said looms.

Another object of the invention is to provide a loom attachment of the character specified so worked out that terry pile can be formed in the fabric at the desired space or intervals therein.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application, and in which

Fig. 1 is an end elevation of a portion of the loom having an attachment constructed in accordance with the invention;

Fig. 2 is a top plan view of the structure shown in Fig. 1;

Fig. 3 is a perspective view partly broken away and partly in section illustrating the mounting for the hooks which form the loops in the fabric;

Fig. 4 is a diagrammatic plan view illustrating the path of movement of the loop forming hooks during their cycle of operation;

Fig. 5 is an elevational view partly in section and taken at right angles to Fig. 4, showing one of the hooks and the position of the hook in a loop formed thereby;

Fig. 6 is a view similar to Fig. 5 but illustrating the position of the hook as it is moved beneath the upper warp threads of the warp shed to initiate the operation of the formation of the loops;

Fig. 7 is a detail elevational view on an enlarged scale of the rack and pinion connection between the operating mechanism for the loop forming attachment and the lay sword;

Fig. 8 is an enlarged sectional elevation taken substantially on line 8—8 of Fig. 1; and

Fig. 9 is an enlarged sectional elevation taken substantially on line 9—9 of Fig. 1.

The invention briefly described consists of a loom attachment comprising a plurality of members, such as hooks, so mounted and so constructed and arranged that the members can be moved beneath and into engagement with the upper warp threads of the warp shed and can then be moved longitudinally of the warp threads to form loops therein. The invention further comprises control means whereby the operation of the loop forming members can be controlled in such a manner as to form loops at the desired intervals or spaces in the fabric.

Further details of the invention will appear from the following description.

The terry pile attachment can be attached to or mounted on a loom of standard construction and in the drawings there is illustrated a loom frame 20, a lay sword 21 pivotally mounted thereon and operated in any suitable manner, the lay 22 and reed 23 carried by the lay.

The operating mechanism for the standard loom parts has not been illustrated since it forms no part of the present invention.

Harness mechanism of any standard construction forms a shed in the warp in the usual manner and in Fig. 1 the upper warp threads are shown at U and the lower warp threads at L. The fabric F is carried around a roll 24 and is wound on a cloth or fabric roll 25.

The loop forming the mechanism comprises a plurality of members or hooks 30 which are carried by a bar 31 and, as illustrated, are screwed into the bar, the positions of the hooks being determined and fixed by lock nuts 32. The bar 31, as shown particularly in Fig. 2, is secured to the ends of arms 33, 33 formed on sleeves 34, 34 pivotally mounted on a hollow shaft 35.

The hooks 30 may be of any desired dimension to fit the requirements of the material and pattern being formed and, as shown in Fig. 3, the angular ends of the hooks are inclined downwardly and are preferably beveled at their ends, as shown at 36. Furthermore, the arms 33, 33 on the ends of which is mounted the cross bar 31, are also inclined downwardly as shown in Fig. 1. The ends of the hooks 30, as shown in Figs. 2 and 3, slightly overlap, that is, the end of each hook extends beneath the next hook but is slightly spaced therefrom.

It will be understood that the bar 31 and hooks 30 extend across the full width of the warp or fabric, the bar and hooks forming what might be termed a rake.

The sleeves 34, 34 have also formed thereon arms 37, 37 having at the ends thereof studs 38, 38 on the ends of which are mounted rollers 39, 39. These rollers are disposed beneath fixed plates 40, 40 which are horizontally disposed and maintain the levers comprising the arms 33 and 37 in a relatively fixed vertical position during the movement of the arms and rake forwardly and rearwardly in the manner hereinafter described. The plates 40 will be mounted in the desired plane to position the hooks 30 at the

desired elevation relative to the upper shed of the warp threads.

The shaft 35 has mounted in its ends rack bars 41, 41, thrust bearings 42, 42 being provided between the rack bars and the ends of the hollow shaft 35.

The rack bars 41, 41 are slidably mounted in blocks 43, 43 which are secured to and carried by horizontally disposed flat slide bars 44, 44. These bars are slidably mounted on rollers 45 mounted in brackets 46 carried by base plates 47 secured to the top of the front frame member of the loom.

The slide bars 44 are resiliently held in their front and rear positions of adjustment by means of balls 48 which are actuated by springs 49 mounted in plates 52 disposed above the bars 44. The balls 48 are adapted to engage notches 50 and 51 at the two extremes of movement of the slide bar 44. The actuating means for moving the slide bar forwardly and rearwardly will be described later in the specification.

The rack bars 41 are engaged by pinions 55 and when these pinions are actuated the rack bars move the rake supporting arms 33, 33 laterally in the manner hereinafter described to position the hooks 30 beneath the upper warp threads U of the warp shed. This operation will be described later with reference to the diagrammatic showing in Fig. 4.

The pinions 55, 55 are also engaged by the teeth of rack bars 56, 56 which are carried by slide bars 57, 57 slidably mounted between rollers 58, 59 mounted in the brackets 46.

The slide bars 57 have also secured thereto on the under surfaces thereof racks 60, 60 which are engaged by pinions 61, 61 carried by a shaft 62. This shaft is driven in a manner hereinafter described at predetermined or spaced intervals during the operation of the loom to actuate the loop forming mechanism.

The slide bars 57, 57 have secured thereto and extending upwardly therefrom studs or pins 63, 63 which extend upwardly through slots 64, 64 formed in the upper slide bars 44, 44. Each of these slide bars has secured to the upper surface thereof and adjustably mounted thereon a pair of plates 65, 66. As the lower slide bars 57, 57 are moved forwardly and backwardly the studs or pins 63 extend upwardly therefrom through the slots 64 in the upper slide bars 44 and these pins by their engagement with the plates 65, 66 move the upper slide bars 44, 44 forwardly and rearwardly to their two extreme positions of movement. As the bars 44, 44 are moved in the manner just described the arms 33 and rake carried thereby will be moved forwardly and rearwardly.

In Fig. 4 there are shown four positions of movement of the loop forming members. These positions are designated A, B, C and D. When the hooks are at the position A they are disposed above the upper warp shed and out of engagement therewith. When the loop forming mechanism is operated in the manner hereinafter described, as controlled by the pattern mechanism, the loop forming hooks move from the position A to the position B in which they are disposed beneath the upper warp threads U. As hereinbefore stated, the hooks may be of any desired design or length and, as shown in Fig. 4, each hook engages beneath four warp threads. This construction may, however, be varied as desired. After the hooks have been moved to the position B the slides 44, 44 are moved to the right viewing Fig. 1, thus moving the hooks from the position B to the position C and forming the loops as shown in Fig. 5. After the hooks have been moved to this position the reed moves to the right viewing Fig. 1 to allow the reed to beat up the fabric and thereafter the hooks are withdrawn laterally from the position C to the position D shown in Fig. 4.

During the operation of the formation of the loops the shuttle is so controlled that a pick will be skipped or missed, but the shuttle control mechanism forms no part of the present invention and therefore has not been illustrated.

Operating and Control Mechanism for Loop Forming Attachment

In the form of the invention illustrated the operating mechanism for the loop forming attachment is actuated by the lay sword 21. A link 70 is pivoted at 71 to the lay sword and has pivoted to its other end a rack bar 72 which is slidably mounted in guides 73 secured to the frame of the loom.

The rack bar 72 meshes with a pinion 74 mounted on a spindle 75. Pinion 74 is fixed to a gear 76 which meshes with a gear 77 freely rotatable on a spindle 78. Gear 77 in turn meshes with a gear 79 which is rotatably mounted on a spindle 80 and has formed on one face thereof clutch members 81. The clutch members 81 engage complementary clutch members 82 formed on a clutch sleeve 83 splined at 84 to the spindle 80. A spring 85 is mounted in the sleeve and normally holds the clutch members 81, 82 out of operative engagement with each other. The clutch sleeve 83 has formed therein an annular groove 86.

The spindle or shaft 80 has also secured thereto a sprocket wheel 87 which is engaged by a sprocket chain 88 which drives a sprocket wheel 89 mounted on the shaft 62.

The clutch is controlled in the following manner: A link 90 is pivoted at 91 to the lay sword 21 and has pivoted to its other end an arm 92 which is pivoted on the shaft 75. Arm 92 has pivotally mounted thereon a pawl 93 which is held by a spring 94 into engagement with ratchet teeth 95 formed on a ratchet wheel 96. The ratchet wheel 96 is rotatably mounted on the spindle 75. This wheel has secured to its outer face a plurality of lugs or cams 97. These lugs or cams are adapted to engage a roller 98 carried by the end of a lever 99 mounted on a fixed pivot 100 and having at its opposite end a yoke 101 on the ends of which are mounted rollers 102 which are disposed in the groove 86 of the clutch member 83. When the roller 98 on the lever 99 engages one of the cams or lugs 97, the clutch control lever is operated to move the clutch member or sleeve 83 into operative engagement with the gear 79 whereby the drive will be transmitted to the shaft 80, sprocket 87, chain 88, sprocket 89 and shaft 62.

The cams or lugs 97 can be spaced at any desired intervals on the ratchet wheel 96 to operate the loop forming mechanism to form loops at the desired spaces or intervals in the fabric being woven.

The gear 74 and parts driven thereby are operated only during a portion of the movement of the rack 72, attention being directed to the construction of the gear 74, as illustrated particularly in Fig. 7, wherein it will be seen that the gear teeth extend only part way around the periphery of the gear, the remaining portion of the gear being a concentric surface. The rack bar

rotates the gear only during the intermeshing engagement of the gear teeth and the teeth of the rack bar. The movement of the rack bar 72 and gear 76 are communicated through the gear 79 and clutch to sprocket 87, chain 88 and gear 61 to rack 60. This movement is, however, dependent on the operation of the clutch by the ratchet wheel 96 and cams 97.

The loop forming mechanism can be rendered inoperative if desired by holding the pawl 93 out of engagement with the teeth of the ratchet wheel 96.

In order to hold the ratchet wheel 96 against movement, except when it is being rotated in a clockwise direction by the pawl 93, any suitable holding means may be provided, such as the spring washer 103 shown in Fig. 8, which engages the outer surface of the hub of the ratchet wheel. A holding pawl of the usual construction could be used if desired.

The operation of the machine can be summarized briefly as follows: The cam lugs 97 are mounted on the ratchet wheel 96 in the desired positions to operate the clutch 81, 82 at the desired intervals to set in operation the loop forming mechanism. The ratchet wheel 96 will be fed one increment of movement for each operation of the pick and lay sword.

When the loop forming attachment is clutched in the loop forming hooks will move through the cycle of operation illustrated at A, B, C and D in Fig. 4, thus engaging the hooks with the upper warp threads U of the warp shed. The loops will thus be formed as shown in Fig. 5.

From the foregoing specification it will be evident that the loop forming attachment for forming a terry pile fabric can be easily and readily attached to any standard loom to form the terry pile loops at the desired spaces or intervals in the fabric. These loops can be varied in design, in size and in density to imitate furs, such as Persian lamb, astrakhan, etc., and if desired the loops may be sheared off to form a pile fabric such as velvet or plush.

It will be understood that the warp beam which holds the warp threads in which the loops are formed will be mounted independently of the warp beam for the other warp threads since provision must be made for the extra material required to form the loops.

Although one specific embodiment of the invention has been particularly shown and described it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. A terry pile loop forming attachment for looms comprising a frame, a carriage slidably mounted thereon, a bar carried by and laterally movable relative to said carriage, and means secured to said bar for engaging individual warp threads of the upper threads of the warp shed, and for forming raised loops therein.

2. A terry pile attachment for looms having a reed, lay and lay sword, said attachment comprising a frame, a carriage slidably mounted thereon, a bar carried by and laterally movable relative to said carriage, means secured to said bar for engaging individual warp threads of the upper threads of the warp shed and for forming raised loops therein, and means connected to and operated by said lay sword for operating said loop forming attachment.

3. A terry pile attachment for looms having a reed, lay and lay sword, said attachment comprising a frame, a carriage slidably mounted thereon, a bar carried by and laterally movable relative to said carriage, means secured to said bar for engaging individual warp threads of the upper threads of the warp shed and for forming raised loops therein, operating means for said loop forming attachment and pattern mechanism operated by the lay sword for controlling the operation of said operating means.

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