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PILE WARP LETOFF ATTACHMENT FOR LOOMS

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Fig. 1.

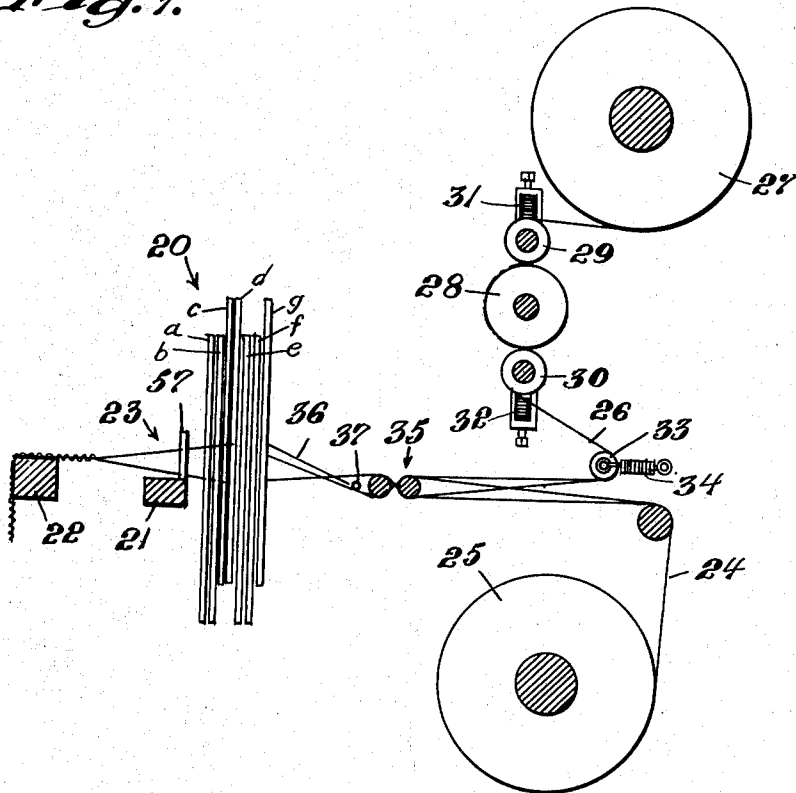
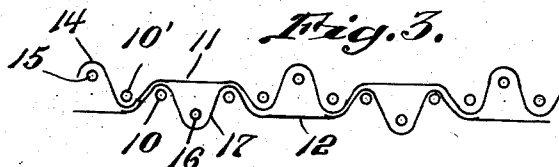
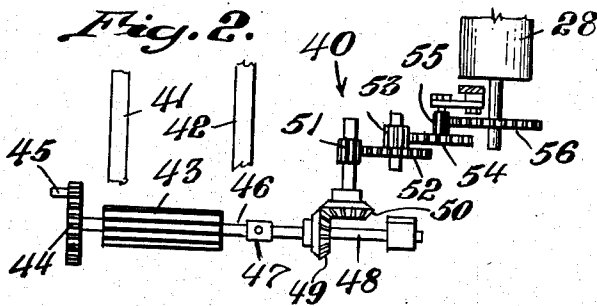


Fig. 2.



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PILE WARP LETOFF ATTACHMENT
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4 Claims. (Cl. 139-104)

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This invention relates to a loom, more particularly to the production of a pile fabric on a loom.

Heretofore in the production of pile fabric, it has been usual to employ a so-called plush loom which is a relatively complicated loom and thus expensive and is more difficult to operate.

One of the objects of this invention is to provide a mechanism for altering a simple, single shuttle loom so that pile fabric may be woven thereon.

More specifically, an object of the invention is to alter the so-called Draper automatic or Crompton single shuttle looms so that pile fabric may be formed on the loom.

Another object of the invention is to utilize a loom having a so-called gem head and providing gearing to positively feed warp threads into the loom from this gem head.

Another object of the invention is to provide a positive feed for warp threads to be used as pile from some part which rotates in time with the harness or shedding mechanism.

Another object of the invention is to provide a positive feed for warp threads to be used as pile from some part which rotates in time with the harness or shedding mechanism and which feed may be reversed to withdraw the warp threads when necessary.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a diagrammatic view shown generally in elevation illustrating the loom operation which is the subject of this invention;

Figure 2 is a top plan view illustrating gearing which is utilized for connecting a part of the gem head of the loom to a sand roll for positively feeding the pile warp; and

Figure 3 is a diagrammatic view illustrating the pile warp as it is disposed with relation to the filling picks for further illustration of this invention.

In proceeding with this invention, I equip a single shuttle loom with wires which are disposed warpwise of the fabric and which extend through the harness of the loom so as to be manipulated by these harnesses. The shuttle passes either over or under these wires and these wires serve to lift the filling so as to dispose the warp threads in a loop forming a pile either on one side or on both sides of the fabric, as occasion may demand, and I additionally feed a friction roll about which the pile warp is disposed

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from some part which rotates in time with the shedding mechanism so that this pile warp may be drawn from a beam and more easily drawn into the fabric to be disposed in its raised or looped position.

The fabric which I am illustrating is shown diagrammatically in Figure 3 where at 10 there is illustrated filling threads which are in the line of the so-called ground fabric. These filling threads are woven with additional warp threads (not shown) as well as being woven with pile warp threads which are here illustrated at 11 and 12. The pile warp thread 11 is thus woven about the two filling threads 10-10' in the ground of the fabric and is looped as at 14 over the filling thread 15 on the upper side of the ground fabric by reason of the wires in the loom being disposed beneath the filling thread 15 and raising this filling thread so as to draw the warp thread 11 in a loop as at 14 over this raised filling thread. In the same way the filling thread 16 is caused to form the loop 17 by wires above the filling thread 16 being pressed downwardly so as to draw the loop 17 from the warp about this filling thread.

In the diagrammatic showing of the loom in Figure 1, there are a plurality of harnesses designated generally 20. A fragmental portion of the lay is shown at 21 and the breast beam is shown at 22. The shedding occurs as shown at 23 and the different harnesses accommodate base or ground warp threads 24 drawn from the beam 25, while warp threads 26 are drawn from the beam 27 about a friction and sand roll 28 and guided by pressure rolls 29 and 30 which are urged into engagement with the sand roll by springs 31 and 32 which may be adjusted as to pressure. The warp threads 26 are also tensioned about a floating or guide roll 33 which is drawn by springs 34 to apply the desired tension. These warp threads pass about lease rods 35 as indicated. A plurality of wires are designated 36 and are supported at one end as at 37. These each pass through a harness which serves to control the manipulation of the wires. These wires are added to the usual single shuttle loom as is also the friction sand roll 28 and also a mechanism designated generally 40 and shown in Figure 2 which is utilized for driving the sand roll 28. The two arches running parallel with the breast beam are designated 41 and 42 in Figure 2 which serve to support a usual gem head (not shown) which has a harness chain sprocket 43 to operate the shedding mechanism. A hand wheel 44 with handle 45 is on the shaft to which

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the chain sprocket 43 is fixed by means of which the said sprocket may be turned backwards when the condition of loom operation requires such action, as resetting the harness chain after a pick out or for reversing the feed of the sand roll to draw back the warp. I extend the shaft 46 by means of a coupling 47 as at 48 and take off from this shaft by means of bevel gears 49, 50 and the train of gears 51, 52, 53, 54, 55 and 56, all suitably supported on shafts in bearings, motion for driving the friction or sand roll 28. The sprocket 43 is in turn rotated step by step in a well known manner by usual mechanism (not shown) to advance the harness chain to operate the shedding mechanism. The rotation of shaft 46 will through the gear train above described also rotate the sand roller 28 in a step by step fashion to positively advance the pile warp threads in amounts to provide the necessary length to form the loops in the fabric.

By the use of the additional wires which are used in plush looms and this gearing mechanism shown generally at 40, I may adapt a single shuttle loom into a form which may be utilized for weaving a pile fabric. In making the pile fabric shown in Figure 3, seven harnesses are employed. The harnesses *a* and *b* are for the pile warp threads 11 and 12 taken from the supply 27; harnesses *c*, *d*, and *e* are for the ground warp threads 24 taken from the supply 25; and the harnesses *f* and *g* are for the wires 36. On the first pick of a repeat, the harness *a* is raised and the remaining harnesses are lowered to form a shed in which only the loop warp threads 11 are in the upper portion thereof. The filling thread 15 by means of the usual shuttle (not shown) is passed through the shed and lays the said filling thread over the other warp threads and the wires.

On the second pick, the shedding mechanism will raise harnesses *c*, *d*, and *g* and lower harnesses *a*, *b*, *e*, and *f*. The wire 36 raised by harness *g* and which is associated with the pile warp threads 11 will lift the stretch of the filling thread 15 passed thereover on the said first pick, out of the plane of the ground fabric so as to draw in an additional amount of the said pile warp threads 11 and dispose them in a loop form. Another stretch of filling thread 15 will now be laid in the shed so formed.

On the third pick, harnesses *a*, *b*, *e*, and *g* will be raised and harnesses *c*, *d*, and *f* will be in the lower position to form the shed through which a stretch of filling will be laid.

On the fourth pick, only harness *b* will be in the lower position and the other harnesses in the raised position, thus forming a shed in which only the loop warp threads 12 will be in the lower portion of the shed through which another stretch of filling thread will be laid.

On the fifth pick, harnesses *c*, *d*, and *f* will be in the lower position and the other harnesses in the raised position. The wire 36 associated with the pile warp thread 12 will be in the lower position and will have moved the stretch of filling thread 15 laid in the next prior formed shed, out of the plane of the ground fabric so as to draw in an additional amount of pile warp threads 12 to dispose the same into loop form on the other side of the fabric from that in which the first loop was formed.

On the sixth pick of the loom, harnesses *a*, *b*,

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d, and *e* will be in the lower position and harnesses *c*, *f*, and *g* in the raised position, thus forming a repeat of the said fabric shown in Figure 3.

After the fabric has been made and usually removed from the loom, the stretches of the filling thread raised out of the plane of the ground fabric on both sides thereof, as above described, are removed by any convenient means, such as by cutting the same at one edge of the fabric and manually pulling the said stretch of the filling out from the other edge.

The pile formed from the warps 11 will be in alternate arrangement to the pile formed from the warp 12 on the opposite side of the fabric. This type of fabric is very effective when made of mohair to serve as an insulation for coats and the like.

I claim:

1. In a loom having harness shedding mechanism provided with a harness chain sprocket having a shaft extending therefrom the combination therewith of a friction feed roller about which a pile warp is disposed, and means including a gear train operated from said shaft and transmitting motion to said roller to feed the pile warp into the shed.

2. In a single shuttle loom having harness shedding mechanism provided with a harness chain sprocket having a shaft extending therefrom the combination therewith of a friction feed roller about which a pile warp is disposed, and a train of gears including a pair of miter gears operated from said shaft and transmitting motion to said roller to feed the pile warp into the shed.

3. In a loom having a harness shedding mechanism provided with a harness chain sprocket having a shaft extending therefrom, the combination therewith of a friction feed roller about which a pile warp is disposed, and a train of gears operatively connected to said sprocket shaft for transmitting motion therefrom to said roller to feed the pile warp into the cloth, and a resiliently mounted roller over which said pile warp passes from said feed roller to the shed.

4. In a loom having a harness shedding mechanism provided with a harness chain sprocket, the combination therewith of a friction feed roller about which a pile warp is disposed, a pressure roller on opposite side of said feed roller and spring urged for movement towards said feed roller to provide opposite bites between said feed roller and pressure rollers for engaging the said warp, and a train of gears operatively connected to said sprocket for transmitting motion therefrom to said feed roller to feed the pile warp into the shed.

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