

J. C. BROOKS.

LOOM.

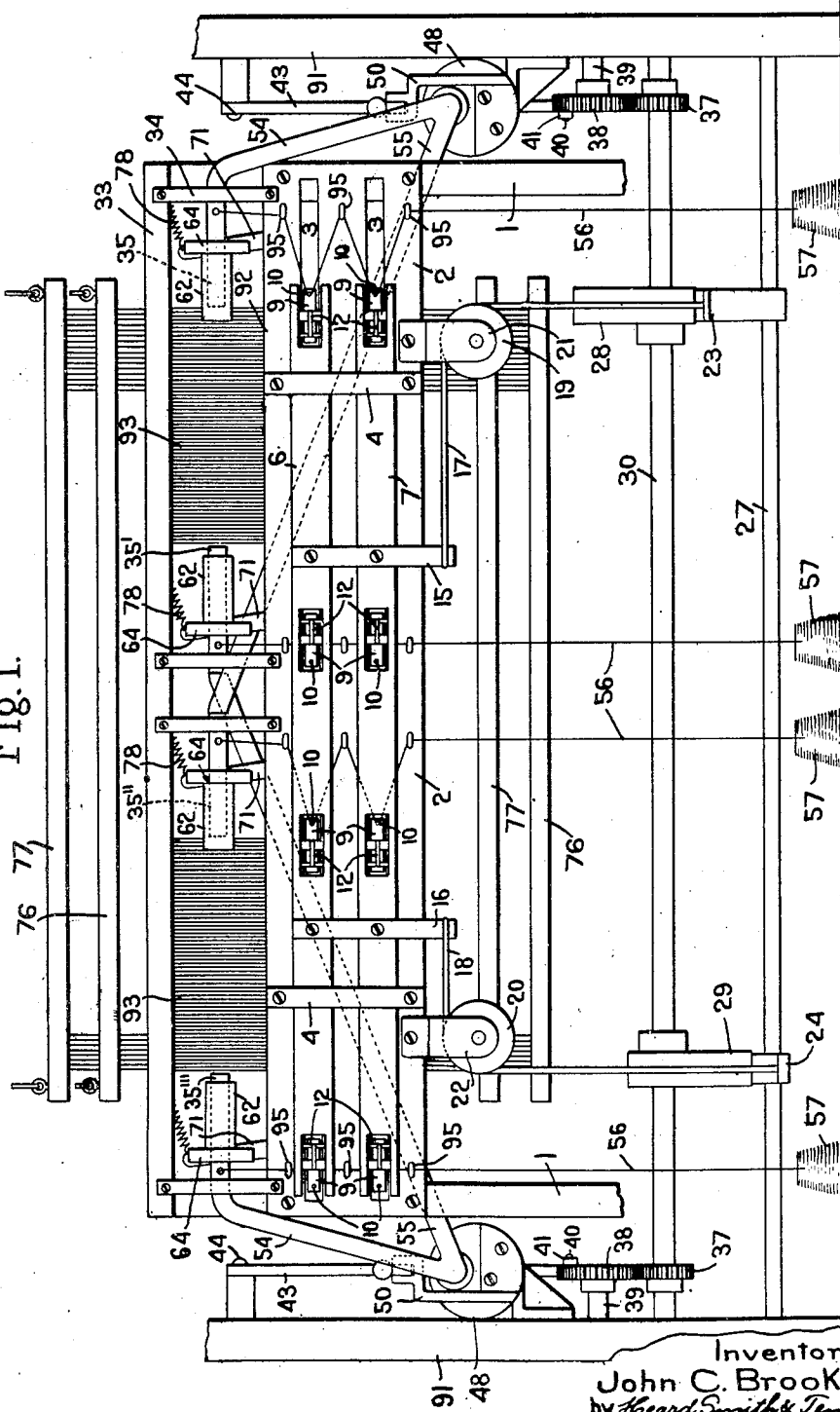
APPLICATION FILED APR. 23, 1919.

1,386,550.

Patented Aug. 2, 1921.

3 SHEETS—SHEET 1.

Fig. 1.



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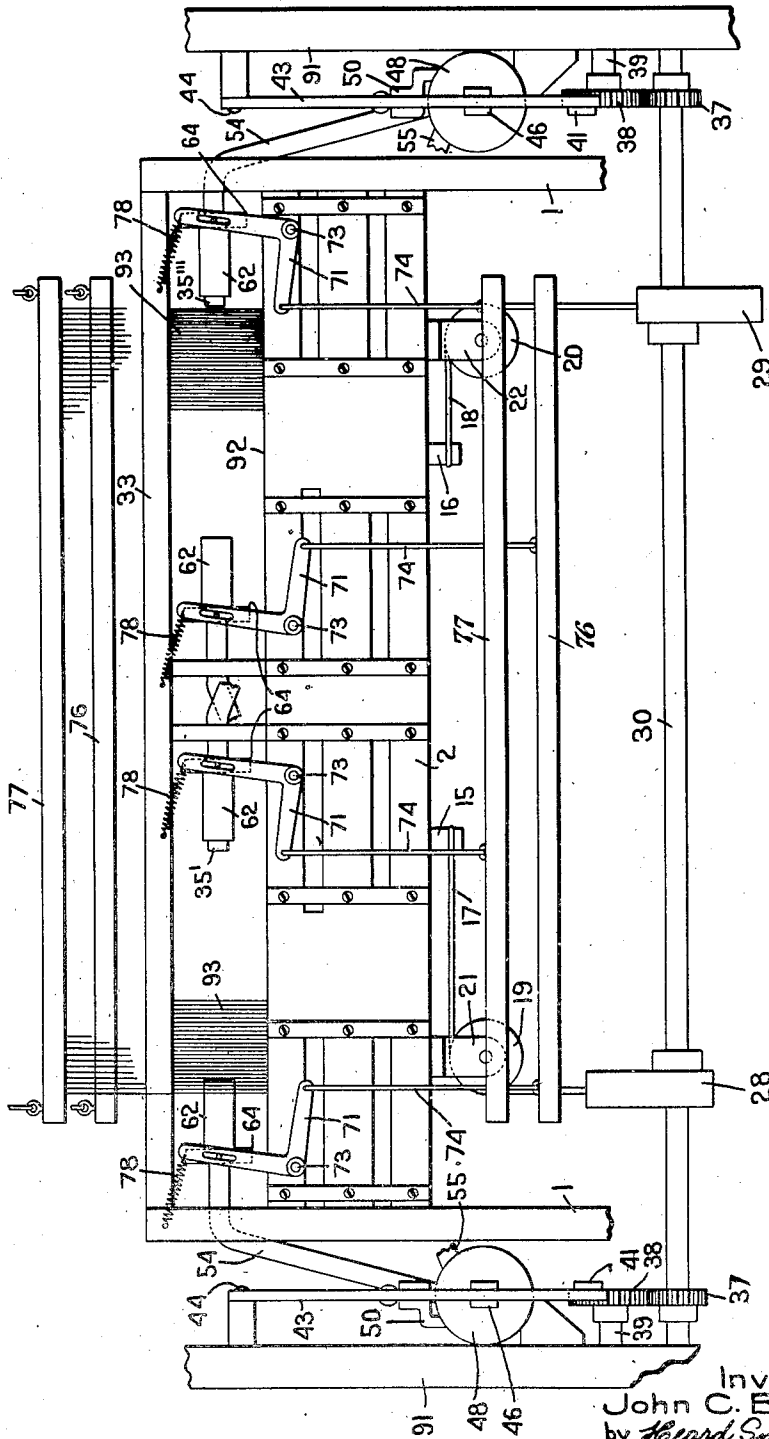
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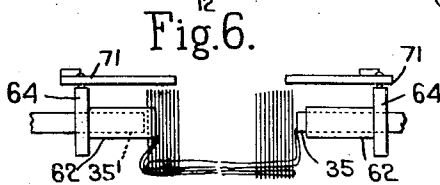
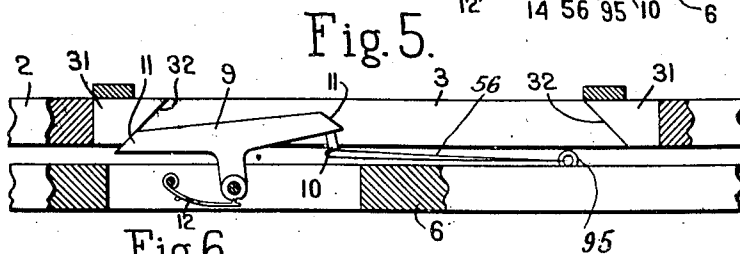
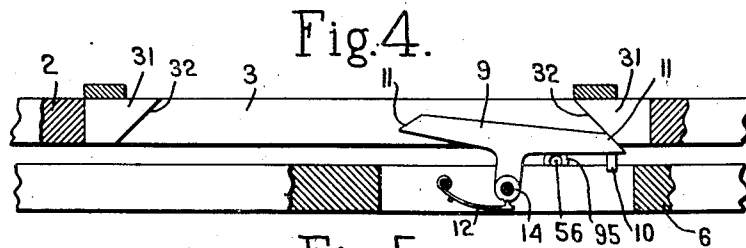
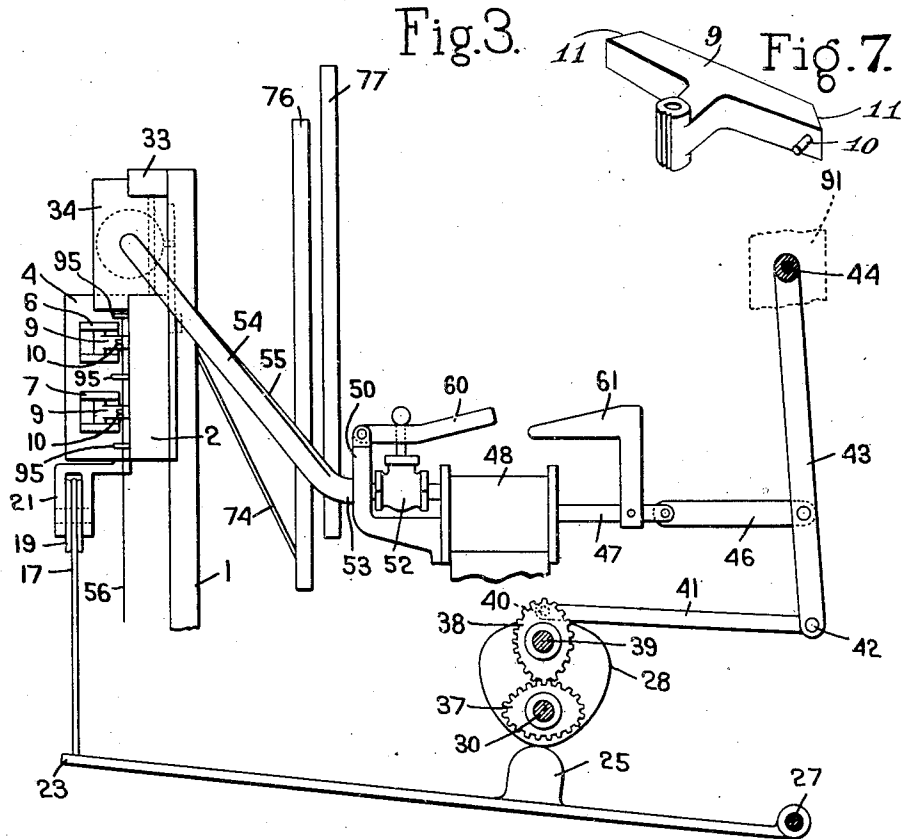
3 SHEETS—SHEET 2.



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 3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN C. BROOKS, OF PATERSON, NEW JERSEY.

LOOM.

1,386,550.

Specification of Letters Patent.

Patented Aug. 2, 1921.

Application filed April 23, 1919. Serial No. 292,121.

To all whom it may concern:

Be it known that I, JOHN C. BROOKS, a citizen of the United States, residing at Paterson, county of Passaic, State of New Jersey, have invented a new and useful Improvement in Looms, of which the following description, with the following drawings, is a specification, similar characters on the drawings representing similar parts.

The present invention relates particularly to looms of that type which are constructed to deliver the filling into the warp-sheds by means of an air blast acting directly on the filling.

I have shown a loom of this type in my Patent No. 1096283, dated May 12, 1914, and also in an application filed by me October 2, 1918, Se. No. 256,589.

In the device illustrated in the above-mentioned patent a filling measuring lever is employed, which draws off or measures a length of filling suitable for each pick, and the arrangement is such that the filling is under the constant restraint of said lever while it is being blown into the warp-sheds.

In the device illustrated in my above-mentioned application Se. No. 256,589 the filling is drawn off from the source of supply and measured for each pick by means of feeding rolls, and the air blast arrangement is such as to act on the filling as fast as it is drawn off by the said rolls.

While both of these constructions are fully practicable, yet I have found that there are some advantages resulting from using a short quick blast of air, in the nature of a puff, for blowing the filling into the warp-sheds, and when this method of placing the filling is employed it is desirable that the length of filling for each pick should be free from restraint when it is acted on by the air blast so that it can be quickly and instantly blown into position. These features are especially advantageous when wide fabrics are being made and when the loom is operating rapidly.

Accordingly one feature of my present invention contemplates the provision of means for drawing off a length of filling suitable for each pick and then releasing said length so that it is free from restraint while it is being blown into the warp-sheds, and another feature of the invention contemplates the provision of means for producing and delivering a short quick blast of air after the

length of filling thread has been released, thereby to blow said length into the warp-sheds.

I have found from practice that if the length of filling for each pick is perfectly free from restraint a short quick blast of air of low volume and pressure will blow the filling a considerable distance and will operate better for laying the filling than a long blast of air under high pressure.

Where a short quick blast of air of low volume and pressure is used and the weaving is done with a filling thread of continuous length by laying double picks it sometimes happens that the portion of the filling leading from the edge of the cloth to the air blast nozzle will remain loose, thus not binding the selvage sufficiently. To eliminate this my present invention contemplates means to positively insert the first portion of an entering pick of filling, thus preventing any looseness at the selvage. In order to give an understanding of my invention I have illustrated in the drawings a selected embodiment thereof, after which the novel features will be pointed out in the appended claims.

Inasmuch as the invention relates simply to the manner of delivering the filling thread into the warp-sheds I have not deemed it necessary to illustrate a complete loom, but have contented myself with showing a sufficient portion of the loom to enable my invention to be understood.

In the drawings Figure 1 is a front view of a portion of loom having my improvement applied thereto, the breast beam being omitted and said figure showing the front of the lay.

Fig. 2 is a view showing the rear of the lay.

Fig. 3 is a fragmentary view showing the means for producing and delivering the air blast and also the cam for actuating the filling measuring device.

Figs. 4 and 5 are enlarged sectional views of Fig. 1.

Fig. 6 is a more or less diagrammatic view showing the manner of positively inserting the filling into the warp-shed.

Fig. 7 is a perspective view of one of the pulling-off members.

91 indicates a portion of the loom frame, 92 the usual lay which is carried by the usual lay swords 1, 93 is the reed, 33 the reed-cap or hand-rail, and 76, 77 the harness frames. These parts are or may be all as usual in

looms, and form no part of my present invention.

The lay has mounted thereon air blast nozzles through which the filling 56 is delivered into the warp-sheds, said filling being taken from suitable sources of supply 57. In the construction shown I have illustrated a loom capable of weaving two webs simultaneously, and for this purpose the reed 93 is divided into two sections and there are four air blast nozzles, one each side of each web of warp threads. These air blast nozzles are indicated 35, 35', 35'', 35'''. These air blast nozzles are arranged in pairs, with the nozzle of each pair directed toward each other and situated on the opposite sides of a web of warp threads. The means for delivering the air blast to these nozzles will be described later.

The lay swords 1 have secured thereto beneath the lay a board or supporting member 2, which has associated therewith means for measuring or drawing off lengths of filling threads and then releasing said lengths. This filling measuring device is shown as in the form of two rods or bars 6 and 7, which are supported for reciprocating movement in suitable brackets 4 that are secured to the supporting board 2. These bars or rods 6 and 7 are situated in front of the supporting board 2, and they carry pulling-off elements 9 which are pivoted thereto at 14 and which operate in slots 3 formed in the supporting board 2. There is a pulling-off element 9 on each rod 6, 7 for each filling thread. These pulling-off elements 9 are provided with hooks 10 adapted to engage the filling thread, and are also formed at their ends with cam surfaces 11. The slots 3 in which the members 9 operate are provided at their ends with blocks 31 having cam surfaces 32 which are adapted to engage the cam surfaces 11 of the pulling-off elements 9 as the bars 6 or 7 reciprocate, and thereby swing said pulling-off elements from the position shown in Fig. 5 to that shown in Fig. 4, and vice versa. The filling threads 56 extend from the supply 57 up through guide eyes 95 carried by the supporting board 2, said filling threads passing between said board and the reciprocating bars 6 and 7. The position of one of these filling threads is indicated in Fig. 4, and it will be observed that in said figure the pulling-off member 9 has been swung into such a position by its engagement with the cam surface 32 that the pin 10 is located behind said filling thread. When therefore the bar 6 moves to the left Fig. 4 into the position shown in Fig. 5 the pin will engage the filling thread and will form a bight in the latter between two of the guide eyes 95, thus drawing off a length of filling from the supply. When the bar 6 reaches the position shown in Fig. 5 one end

11 of the pulling-off member 9 will engage the left-hand cam face 32, thus swinging said member into the position shown in Fig. 5 and withdrawing the pin 10 from engagement with the filling thread, thereby releasing the latter. A spring 12 is employed to yieldingly hold the pulling-off member in either of these two positions. Since each bar 6 and 7 has a pulling-off member for each filling thread it will follow that each time the two bars move to the left a double bight will be formed in the filling thread, as shown in Fig. 1, and the construction is such that the amount of filling thus pulled off from the supply 57 is sufficient to extend twice across the web of warp threads and thereby form a double pick. I will use two filling threads for each fabric, one filling thread being inserted on one side of the fabric and the other on the other side, and the pulling-off members 9 are so constructed that when the bars 6 and 7 move to the left into the position shown in Fig. 1 the right-hand pulling-off member 9 will act on the filling thread at the right-hand side of the web, thereby to draw off the desired length of filling, and when the bars 6 and 7 move to the right the appropriate pulling-off member 9 will act on the filling thread at the left and draw off a length therefrom. It will be understood, of course, that each length of filling thread is released from the pulling-off members as soon as it has been fully pulled off, so that thereafter said length is under no restraint and can be freely blown into the warp-sheds. Any suitable means for reciprocating the bars 6 and 7 may be used. These two bars are connected together by two cleats or braces 15 and 16. The cleat 15 has a flexible connection 17 secured thereto, which passes around a direction pulley 19 pivoted in a bracket 21 secured to the supporting board 2 and connected to a lever 23 that is pivoted to the loom frame at 27. This lever has a follower portion 25 which is acted on by a cam 28 on the usual cam shaft 30.

The bracket 16 has a similar flexible connection 18 secured thereto which passes around a direction pulley 20 supported in a bracket 22, also secured to the supporting board 2, said connection leading to a lever 24 which is acted on by a cam 29 carried by the cam shaft. These cams 28 and 29 are oppositely disposed and act to move the levers 24 and 23 downwardly alternately. By this means the bars 6 and 7 are given their reciprocating motion in timed relation with the other movements of the loom, and it will be observed that on the movement of the bars in one direction the filling thread 56 on one side of the web of warp threads will be pulled off and then released, while during the movement of the bars in the opposite direction the filling thread on the

other side of said web will be pulled off and then released.

As stated above, means are provided for blowing each length of filling into the warp-shed; just after it has been released, this being done by delivering a blast of air through the appropriate nozzle 35, 35', 35'', 35'''. While any suitable means for developing and delivering the air blast may be employed, I have herein shown a construction in the form of a pump which is actuated by the loom and which operates to develop a charge of compressed air and then to deliver it to the appropriate nozzle at the proper time.

Secured to the loom frame on each side thereof is a pump 48, the cylinder of which has a pipe 53 connected thereto which is branched, the two branches being indicated at 54, 55, leading to two of the nozzles. The branch 54 on one side of the loom leads to the nozzle 35, and the branch 55 leads to the nozzle 35''. The branch 54 on the opposite side of the loom leads to the nozzle 35''', while the branch 55 leads to the nozzle 35'. The piston rod 47 for the piston of each pump is connected by a link 46 to a swinging lever 43 which is pivoted to the loom frame at 44. This swinging lever 43 has a link 41 pivoted thereto at its lower end at 42, said link being also pivotally connected to a crank pin 40 on an elliptical gear 38 which is rotatably mounted on a stud 39 carried by the loom frame. This elliptical gear meshes with another elliptical gear 37 which is fast on the cam shaft 30. A similar connection is provided for actuating the piston in each pump. The cam shaft 30 makes one revolution for every two picks, and therefore each piston will be given its compression stroke once for every two picks. Each pipe 53 has a self-closing valve 52 therein, which can be opened by upward movement of a lever 60 pivoted to a suitable bracket 50. Each piston rod 47 has a cam member 61 fast thereto which is arranged so that it will engage the lever 60 and raise the latter just before the piston reaches the end of its compression stroke. In the operation of each pump, therefore, the piston will be moved forwardly, thus compressing the air therein, and just before the piston reaches the end of its compression stroke the valve 52 will be opened automatically, allowing the compressed air to be delivered through the pipe 53 and its branches 54, 55. The gearing for driving the pumps is so arranged that the pumps work alternately, one pump operating for one pick and the other pump operating for the next pick. Therefore at alternate picks the air blast will be delivered through the nozzles 35, 35'', and at the other picks the air blast will be delivered through the nozzles 35', 35'''. It will be understood, of course, that the

pump-actuating mechanism is so timed that the air blast will be delivered when the lay is on its back stroke.

Where the filling is in the form of a continuous length as herein shown each blast of air will result in blowing a loop of filling into the warp-shed, thus laying a double pick. In order to insure that the filling will be laid tightly at the selvage I propose to employ means for positively introducing the first portion of each filling into the warp-sheds. This is accomplished by employing nozzle extensions which telescope over the air blast nozzles and are adapted to be projected beyond the same. These nozzle extensions are shown at 62, and each is carried by a holder 64 slidably mounted on the nozzle. These holders are connected to elbow levers 71 which are pivoted to the board 2 at 73. The horizontal arms of two of these elbow levers are connected by flexible connections 74 to the lower rail of the harness 76, and the horizontal arms of the other levers 71 are connected to the lower rail of the other harness 77. The upper ends of the levers are connected to the hand-rail 33 by return springs 78. The two levers on one side of each web of warps are connected to one harness frame and the other two levers connected to the other harness frame, and with this arrangement it will be observed that when any harness frame is lowered the levers connected thereto will be turned thereby to move the nozzle extensions forwardly beyond the nozzles. In Fig. 1 the nozzle extensions on the right-hand of each web are shown as projected. When these nozzle extensions are thus projected they are introduced into the warp-shed as shown in Fig. 6, and by this introduction the entering portion of the filling thread is positively introduced into the warp-shed, and said thread is thus laid tightly against the selvage. When therefore the air blast is delivered the loop of filling will be thrown across the warp-shed and the filling will be laid to make a tight selvage.

It will be seen from the above that with my invention I draw off a length of filling and then release said length so that it is entirely free from restraint, after which said length is subjected to a quick short blast of air of low volume which blows the filling into the warp sheds in the form of a loop, thus making a double pick. It will also be seen that by using the nozzle extensions the portion of each filling adjacent the selvage is laid tightly, thus making a firm selvage to the cloth. The releasing of the filling thread from the pulling-off mechanism so that said filling is free from the restraint of the pulling-off mechanism is a decided advantage because where a length of filling thread which has thus been pulled off is free from restraint a short quick blast will

effectively blow the length of filling across the shed and it is not necessary to use a continued air blast.

I have found from practice that a short quick blast of air will effectively blow an unrestrained length of filling across the shed and will lay the filling properly in position.

While I have illustrated herein a selected embodiment of my invention, I do not wish to be limited to the constructional details shown.

I claim:

1. In a loom of the type using an air blast to deliver weft threads into the warp sheds, the combination with shed-forming mechanism, of means to measure off a length of filling for each pick and then to release said length so that the end thereof is free from restraint, and pneumatic means to deliver the measured length to the shed.

2. In a loom of the type described, the combination with shed-forming mechanism, of a filling delivery nozzle, means to draw off from the source of supply a measured length of filling for each pick and then to release said measured length from the drawing-off means, and pneumatic means operative after the length is released to deliver said length through said nozzle and into the shed.

3. In a loom of the type described, the combination with means to draw off a measured length of filling from a source of supply, means to release the measured length so that it is free from the restraint of the drawing-off means, and means to deliver a blast of air transversely of the warp sheds thereby to blow said measured length across the warp sheds.

4. In a loom, the combination with a nozzle through which filling is delivered to the warp sheds from a source of supply, of means acting on the filling between said nozzle and source of supply to draw off a measured length of warp thread and then to release said length from the drawing-off means, and pneumatic means to deliver said measured length from said nozzle after it is thus released.

5. In a loom, the combination with a filling delivery nozzle through which filling is delivered from a source of supply, a device acting on the filling between the nozzle and supply to draw off from the supply a measured length of filling, means to disengage said device from the filling when said measured length has been drawn off, and pneumatic means to deliver said length through the nozzle to the warp sheds.

6. In a loom of the class described, the

combination with a lay, of a filling delivery nozzle mounted thereon and provided intermediate of its ends with an aperture through which filling is delivered, means acting on the filling in the rear of the nozzle to draw off a measured length from the source of supply and then to release said length, and means to deliver a blast of air through said nozzle thereby to blow said measured length across the warp sheds.

7. In a loom, the combination with a filling delivery nozzle, of means to deliver an air blast through said nozzle movable into and out from the warp shed thereby to blow a filling therefrom through the warp sheds, and means to project the nozzles into the warp sheds at the time the filling is delivered therefrom.

8. In a loom, the combination with a filling delivery nozzle, of means to draw off from a source of supply a measured length of filling, and means actuated by the loom to deliver an air blast to said nozzle after the measured length of filling has been drawn off from the source of supply thereby to blow said filling from said nozzle through the warp sheds.

9. In a loom, the combination with a filling delivery nozzle adapted to deliver filling from a source of supply to the warp shed, means to draw off a length of filling from the source of supply, a cylinder connected to said nozzle, a piston in the cylinder, connections between said piston and the loom mechanism by which the piston is actuated to place air under compression in said cylinder, a valve controlling the delivery of air from the cylinder to the nozzle, and means to open said valve as soon as the measured length of filling has been drawn off.

10. In a loom, the combination with shed-forming mechanism, of means to draw off from a source of supply a length of filling sufficient for a double pick and then to release said length so that it is free from restraint, and means to cause a blast of air to act directly on said length thereby to form a loop therein and blow it into the warp sheds.

11. In a loom, the combination with means to draw off a length of filling from a source of supply and then to release said length so that it is free from restraint, of means to cause a blast of air to act directly on said filling and blow the latter into the warp sheds, and means to lay the portion of the filling adjacent the selvage under tension.

JOHN C. BROOKS.

Witnesses:

BEULAH LOCKWOOD,
NELLIE DOWD.