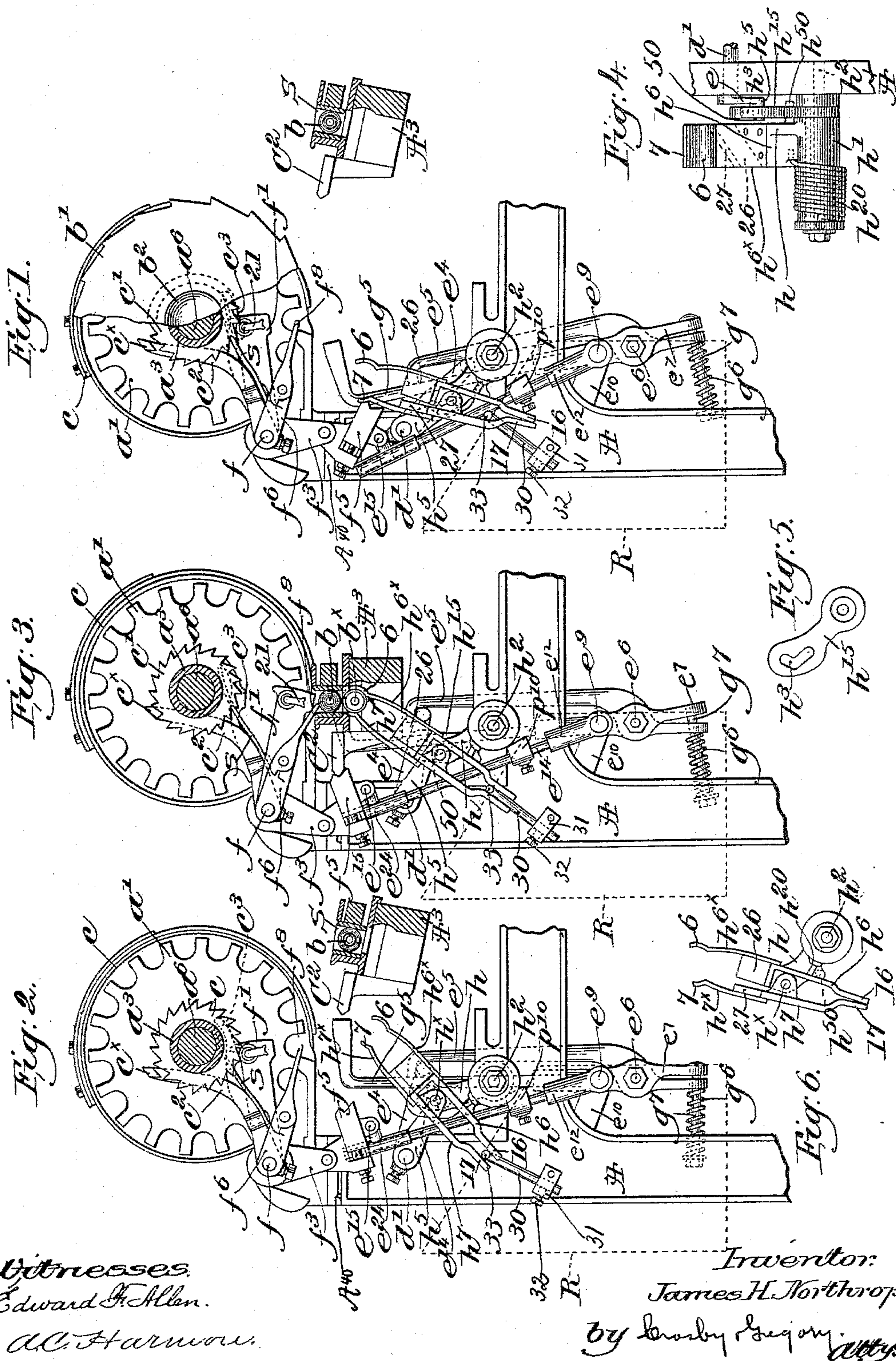


(No Model.)

J. H. NORTHROP.
LOOM.

No. 563,611.

Patented July 7, 1896.



Witnesses:
Edward F. Allen.
A. C. Harmon.

Inventor:
James H. Northrop
by Crosby & Son.

UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
NORTHROP LOOM COMPANY, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 563,611, dated July 7, 1896.

Application filed April 11, 1896. Serial No. 587,094. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NORTHROP, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention relates to that class of looms wherein a series of filling-carriers are supported independently in an intermittently-operated filling-feeder, substantially as shown in United States Patent No. 529,942, the head and tip of each carrier being held, the feeder, when the loom is running properly standing with a filling-carrier directly in the path of a pusher, which forms part of filling-carrier-transferring mechanism acting to automatically transfer a fresh filling-carrier into the shuttle upon failure of the filling, or upon exhaustion to a predetermined extent of the filling on the carrier then in the shuttle.

In the Northrop looms the mechanism hereinbefore referred to is used in connection with a device whereby, when the shuttle is not in correct position to receive a filling-carrier, the filling-carrier-transferring mechanism will not be actuated, said device consisting, essentially, of a shuttle-feeler, which, when the shuttle is not in proper position, actuates the trip cooperating with the pusher of the transferring mechanism, to put it into such position that it cannot be struck by a bunter to operate the pusher, all substantially as in United States Patent No. 529,943, to which reference may be had. In these patents the fresh filling-carrier acted upon the filling-carrier then in the shuttle, to positively eject it therefrom, the rejected filling-carrier dropping into a suitable chute or receptacle provided to receive it, and the filling-feeder, while held from retrograde movement during the filling changing operation, could move forward a slight distance, sufficient to sometimes carry the thread end of the fresh filling-carrier out of proper position to lead into the shuttle-eye.

My present invention has for its object the production of means whereby the ejected filling-carrier is positively engaged by a suitable catcher and moved away from the shuttle, to

be released thereafter and discharged at a suitable point; and I have also provided a detent for the filling-feeder whereby it is held from movement during transfer of a filling-carrier, the detent being controlled by a part of the transferring mechanism.

Figure 1 is a partial end elevation of a loom provided with a filling-feeder, partially broken out, the transferring mechanism, the shuttle-feeler and its cooperating devices, with the lay in section, my invention being embodied therein, the various parts being shown in normal position when the loom is running properly. Fig. 2 is a similar view of the parts shown in Fig. 1, the transferring mechanism being in position to be acted upon to transfer a fresh filling-carrier into the shuttle when the lay moves forward, the catcher approaching its operative position. Fig. 3 shows the parts at the moment the fresh filling-carrier has been inserted in the shuttle, the catcher grasping the ejected filling-carrier, and the detent acting to prevent forward rotation of the filling-feeder. Fig. 4 is a detached front view of the picker and its support in the position shown in Fig. 2. Fig. 5 is a detail view of a slotted arm, to be described; and Fig. 6 is a detached side view of the catcher, to be described.

The loom-frame A , the lay A^3 , the breast-beam A^{10} , rod or rock-shaft d' , the ear f^3 , depending from the pusher, the dog f^5 , pivoted on said ear, the bunter C^2 , connected to the lay, the arm e^4 , attached to the rock-shaft d' and actuated thereby, and the arm e^5 , mounted upon a stud e^6 , on a stand e^7 , secured to a loosely-mounted rock-shaft e^9 , having bearing in a stand e^{10} , secured to the loom side, may be and are all substantially as shown in United States Patent No. 529,943, wherein like letters are employed to designate like parts, the rock-shaft e^9 at a point outside the loom-frame having an arm e^{12} , in which is suitably secured a rod e^{14} , fitted to slide in a sleeve e^{24} , having a crank-pin or projection e^{15} , entering a hole in the dog f^5 , so that when the dog is lifted into the position shown in Fig. 3 the bunter C^2 on the lay will actuate the transferring mechanism to put a filling-carrier into the shuttle if the latter is in proper position in the shuttle-box, all as in said patent.

The shuttle-feeler g^5 , secured to the stand e^7 ,

when the rock-shaft e^9 is turned by the arm e^4 of the rock-shaft d' , will be moved forward toward the advancing lay at a point near the inner end of the shuttle-box, in the position shown in Figs. 2 and 3, so that if the shuttle is in proper position therein to receive a filling-carrier the feeler will not touch the shuttle, the dog f^5 will be acted upon by the bunter, and the transferring mechanism will be operated, but if the shuttle is not in proper position in the shuttle-box to receive a filling-carrier the shuttle will meet the feeler and the latter is pushed forward with the lay, to lower the dog f^5 , by the intermediate devices, so that the bunter will not meet the dog. The spring g^6 , surrounding the rod g^7 , extended through the lower end of the arm e^5 and stand e^7 , controls yieldingly the arm e^5 , as in the patent referred to.

The plate a' of the filling-feeder, the filling-thread-supporting plate b' , rotatable with the feeder, the filling end holder b^2 , with which the filling on each filling-carrier b is connected, the stud f , the pusher f' mounted thereon, the projection 21, the tip-supporting device f^8 , the stud a^6 upon which is mounted the sleeve a^3 of the feeder, and the cover or guard c may be and are substantially as shown in United States Patent No. 529,942, like letters indicating like parts.

In Fig. 1 I have broken out the plate b' , and in Figs. 1, 2, and 3 I have altogether omitted the plate b' , fast on the sleeve a^3 , to avoid confusion, the said sleeve being herein shown as provided with a ratchet-wheel c' , adapted at times to be engaged by a detent c^2 , shown as an upwardly-curved arm loosely mounted on the stud f , and having secured thereon a spring s , which bears against the sleeve a^3 , and when permitted to act draws the lug c^x of the detent into engagement with the ratchet-wheel c' . (See Fig. 3.)

A finger c^3 is rigidly secured to the detent and projects, as shown herein, above the pusher f' , so that when the latter is in inoperative normal position it will act upon the finger c^3 and positively withdraw the detent from the ratchet-wheel, so that the feeder is free to be rotated, the spring s being compressed.

When the pusher descends to transfer a filling-carrier from the feeder to the shuttle S , the spring s will be released, and the pusher moves away from the finger c^3 , so that the spring at once throws the detent into engagement with the ratchet-wheel c' , preventing any forward movement of the feeder. By this detent mechanism the feeder is prevented from rotating forward while the filling-carrier is being inserted in the shuttle, and the thread or filling is thus led in proper position from the disk b' to the shuttle-eye.

As the fresh filling-carrier b is put into the shuttle, Fig. 3, it acts upon the spent filling-carrier b^x and ejects it from the shuttle upon a chute, (marked h in the Patent No. 529,942 referred to,) the chute being so mounted and

actuated that the ejected filling-carrier will be conducted away from the lay, thereby preventing the filling-carrier getting into the working parts of the loom. In this present invention, however, I have provided means for positively engaging or grasping the ejected filling-carrier as it leaves the shuttle, said means thereafter releasing the filling-carrier at the proper time and discharging it into a suitable receptacle.

A stud h^2 , suitably supported at the loom side, has pivotally mounted thereon the hub h' of an arm h , which has cooperating therewith a spiral spring h^{20} , which acts normally to turn toward the lay the upper end of the "catcher," as I shall hereinafter designate the engaging device for the ejected filling-carrier.

I have herein shown the catcher as comprising two jaws h^6 h^7 , provided with flexible extensions h^{6x} h^{7x} , respectively, the outer ends of the latter being slightly and oppositely concaved at 6 and 7. (Clearly shown in Fig. 6.)

The jaw h^6 is secured rigidly to or cast as a part of the arm h , and the jaw h^7 is pivoted to the arm h at h^x , the lower ends of the jaws being bent in toward each other at 16 17 for a purpose to be described. Each jaw is equally inclined at its upper end at the bases of the extensions h^{6x} h^{7x} , as at 26 27, Figs. 4 and 6, so that when the jaws are separated to release a filling-carrier the latter will drop onto the inclined surface and slide from there into a suitable receptacle R . (See dotted lines, Figs. 1 to 3, inclusive.)

A rod 30, adjustably held in a stand 31 on the loom side by a set-screw 32, has its end turned outward at 33 to enter between and act upon the lower ends of the jaws of the catcher, the rod being so located that when the loom is running regularly the end 33 thereof will permit the upper ends of the jaws to open. When, however, a filling-carrier is to be transferred, the rock-shaft d' is rocked to bring the dog f^5 into position to be engaged by the bunter C^2 , and an arm h^5 , fast on said rock-shaft, is raised into the position shown in Fig. 2, such movement of the rock-shaft also bringing the shuttle-feeler g' into operative position.

The arm h^5 has thereon a stud 50, which enters a cam-slot h^3 (see Fig. 5) in an arm h^{15} , loose on the stud h^2 , rocking said arm toward the lay, and thereby permitting the spring h^{20} to turn the arm h in the same direction, a lug h^{50} on said arm h bearing against the outer side of the slotted arm h^{15} . Such movement of arm h swings the catcher bodily toward the lay, and the end 33 of the rod 30 enters between and separates the ends 16 17 of the catcher-jaws, thereby causing their tips 6 and 7 to approach each other, the picker being held in such position that when the lay A^3 comes forward into position shown in Fig. 3 the tips enter the cut-away part of the lay beneath the shuttle-box. At the same time the bunter C^2 strikes the dog f^5 , actuating the pusher f' to transfer a fresh filling-carrier,

as *b*, from the feeder to the shuttle, the spent filling-carrier *b*^x being ejected from the shuttle and directly into the yielding tips of the catcher-jaws.

5 After the return of the various parts of the transferring mechanism to normal position, and also the shuttle-feeler and devices intermediate it and the rock-shaft *d'*, (shown in Fig. 1,) the depression of arm *h*⁵ positively
10 rocks the slotted arm *h*¹⁵ away from the loom, and by the lug *h*⁵⁰ returns the arm *h* to normal position against the action of spring *h*²⁰. This movement of the arm alters the position of the catcher, carrying the upper ends of
15 the jaws down and to the front, and at the same time the end 33 of the rod 30 passes from between the lower extremities 16 and 17 of the jaws, permitting them to open sufficiently to release the filling-carrier, which
20 latter drops onto the inclined surface 26 27 and slides therefrom into the receptacle R. (Shown in dotted lines.)

My invention is not restricted to the precise construction and arrangement herein
25 shown, for, so far as I am aware, it is broadly new to provide means to positively engage and remove an ejected filling-carrier from the vicinity of the shuttle-box.

30 Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a loom, a lay having its shuttle-box slotted for the passage through it of a filling-carrier, a slotted shuttle, filling-supplying
35 mechanism to automatically insert a filling-carrier into the shuttle while in the shuttle-box, a catcher to positively engage and remove a filling-carrier ejected from the shuttle-box, and means to actuate the catcher, substantially as described.
40

2. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher, and means to put said
45 catcher into position relatively to the lay to engage and remove a filling-carrier ejected from the shuttle-box, substantially as described.

3. In a loom, the lay having an open shuttle-box for the discharge through it of a filling-carrier, means to eject a filling-carrier
50 therefrom, a catcher having jaws to positively engage a filling-carrier, means to move said catcher into position relatively to the lay, to engage and remove a filling-carrier ejected
55 from the shuttle-box, and a jaw-controller for the catcher, substantially as described.

4. The combination with a lay having an open shuttle-box, and means to eject a filling-carrier therefrom, of a pivotally-mounted
60 catcher, means to put the catcher into position relatively to the lay to engage and remove a filling-carrier ejected from the shuttle-box, and a discharging device on the catcher, substantially as described.

65 5. The combination with a lay having a shuttle-box open for the discharge of a filling-carrier, and means to eject a filling-carrier

therefrom, of a catcher having yielding jaws to receive and hold a filling-carrier ejected from the shuttle-box, and means to put said
70 catcher into position relatively to the lay to engage and remove the filling-carrier ejected from the shuttle-box, substantially as described.

6. The combination with a lay having a shuttle-box open for the discharge of a filling-carrier, and means to eject a filling-carrier
75 therefrom, of a catcher comprising a pair of pivotally-mounted jaws, a jaw-controlling device to act upon and move the jaws together
80 to receive a filling-carrier, and means to move the catcher into position to receive the filling-carrier and to thereafter remove it, the jaw-controlling device permitting the jaws to separate when the catcher returns to normal position, substantially as described.
85

7. In a loom, means to eject a filling-carrier from the shuttle-box, a catcher comprising a pair of pivotally-mounted jaws having yielding
90 tips and a laterally-inclined discharging portion between the jaws, means to move the catcher to engage a filling-carrier, and a jaw-controller, separation of the jaws releasing the filling-carrier, to pass the latter to the discharging portion of the catcher, substantially as described.
95

8. In a loom, the lay, a shuttle, slotted for the passage therethrough of a filling-carrier, a rotatable feeder to hold a series of filling-carriers, means to transfer a filling-carrier
100 from the feeder to the shuttle, and a normally-inoperative detent for the feeder, controlled by said transferring means, to prevent the feeder from rotating during the operation of the transferring means, substantially as described.
105

9. In a loom, the lay, a shuttle slotted for the passage therethrough of a filling-carrier; a rotatable feeder to hold a series of filling-carriers, a normally-inoperative detent for
110 the feeder, and a pusher to transfer a filling-carrier from the feeder to the shuttle, operation of the pusher controlling the movement of the detent to hold the feeder from rotation, substantially as described.
115

10. In a loom, the lay, a shuttle slotted for the passage therethrough of a filling-carrier; a rotatable feeder for the filling-carriers, a spring-actuated detent to hold the feeder from rotation at times, and a pusher to transfer a filling-carrier from the feeder to the
120 shuttle, the pusher normally holding the detent from engagement with the feeder, whereby when the pusher is transferring a filling-carrier the feeder will be held from rotation, substantially as described.
125

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES H. NORTHROP.

Witnesses:

S. F. SMITH,

GEO. OTIS DRAPER.