



No. 624,371.

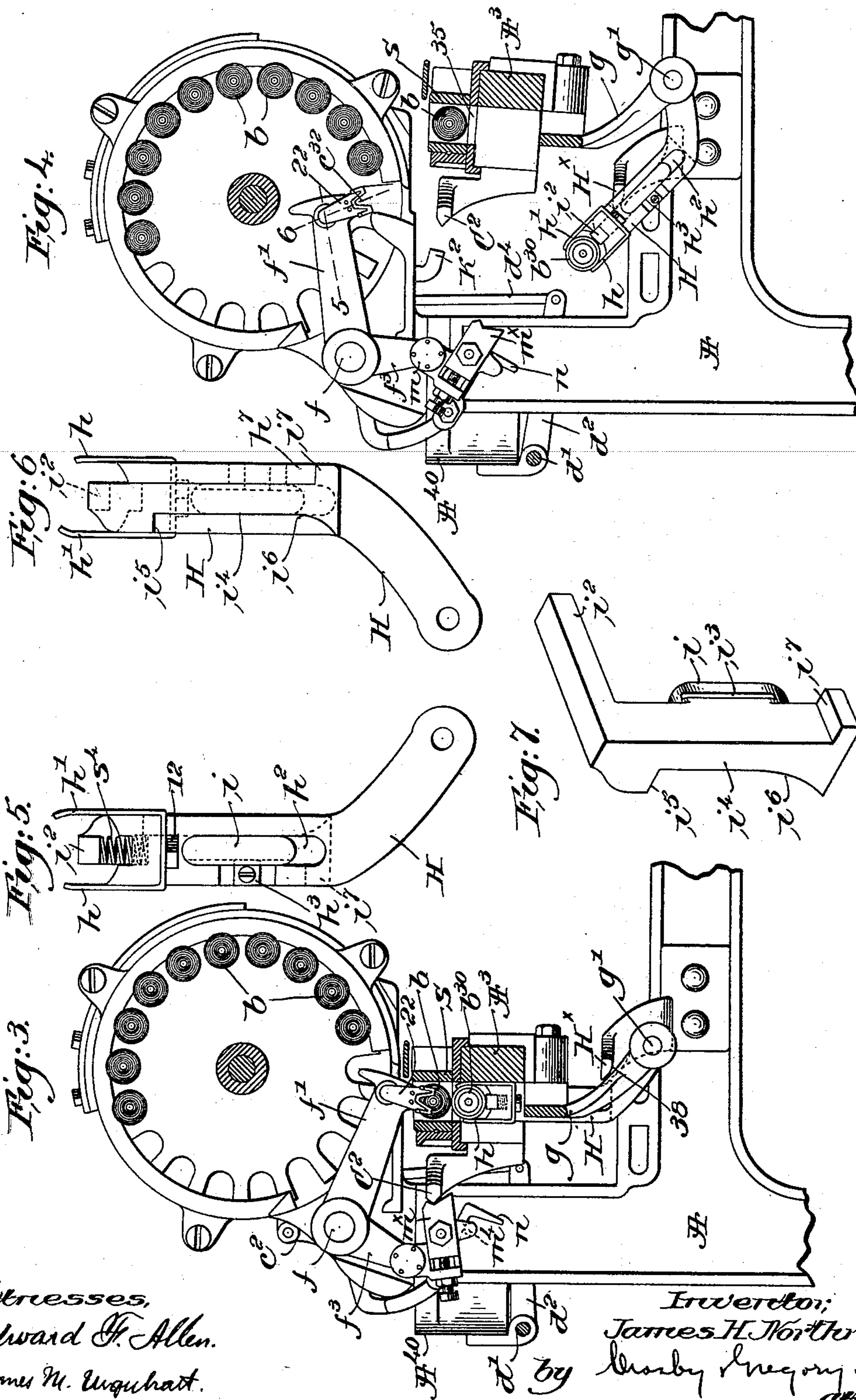
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J. H. NORTHROP.  
LOOM.

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(No Model.)

2 Sheets—Sheet 2.



Witnesses,  
Edward F. Allen.  
James M. Waghart.

Inventor;  
James H. Northrop,  
by  
Marby Gregory,  
attys.



# UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE  
DRAPER COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 624,371, dated May 2, 1899.

Application filed December 19, 1898. Serial No. 699,663. (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 figures on the drawings representing like parts.

This invention relates more particularly to that class of looms provided with automatic filling-supplying mechanism, including an intermittently-operated filling-feeder for supporting a series of filling-carriers by their heads and tips, the feeder holding a filling-carrier in such position when the loom is running properly as to be directly in the path of the pusher or transferrer adapted to automatically transfer such filling-carrier into the shuttle upon failure of the filling or upon exhaustion of the latter to a predetermined extent, such a loom being shown in United States Patent No. 529,940.

My present invention has for one of its objects the production of novel means for engaging the ejected filling-carrier as it is pushed out of the shuttle-box by the incoming fresh filling-carrier, the catcher which receives the ejected filling-carrier being thereafter moved away from the shuttle-box to a suitable discharge-point, whereat the filling-carrier is positively expelled from the catcher.

In United States Patent No. 563,611, dated July 7, 1896, a loom is shown provided with a catcher for an ejected filling-carrier, said catcher comprising pivotally-connected jaws which are opened at the proper time to permit the filling-carrier to drop out and mounted upon the loom-frame, whereas in my present invention the catcher is mounted upon the lay and movable laterally thereto at the proper time to discharge the filling-carrier caught by it, the latter being made operative by or through the action of receiving the filling-carrier ejected from the shuttle-box.

Certain other features of my invention, to be hereinafter described and claimed, concern the peculiar construction of the transferrer for the filling-carrier, whereby the filling-carrier is more completely controlled during its transfer from its filling-feeder to the shuttle.

Figure 1, in front elevation, represents a sufficient portion of a loom provided with automatic filling-supplying mechanism to be understood and with my present invention applied thereto, the filling-supplying mechanism being substantially as shown in United States Patent No. 529,940 referred to. Fig. 2 is a transverse sectional view thereof on the irregular line  $xx$ , Fig. 1, looking toward the left, the lay being shown back and with the various parts in normal position. Fig. 2<sup>a</sup> is an enlarged perspective detail of a portion of the transferrer to be described. Figs. 3 and 4 are sectional views taken on the line  $xx$ , Fig. 1, the lay being shown as fully forward in Fig. 3 and showing the transferrer as having just inserted a fresh filling-carrier into the shuttle, while the ejected filling-carrier is engaged by the catcher, the latter being shown in Fig. 4 in discharging position, the transferrer having returned to its normal position and the lay moved back. Figs. 5 and 6 are enlarged opposite side views of the catcher detached, and Fig. 7 is a perspective view of the expeller and dog connected therewith.

The loom-frame  $A$ , the breast-beam  $A^{40}$ , lay  $A^3$ , having the bottom of one of its shuttle-boxes cut away below the self-threading shuttle  $S$ , the filling-feeder comprising connected rotatable plates suitably shaped to receive the ends of the filling-carriers  $b$ , the weft-thread-supporting plate  $b'$ , the stud  $f$ , the transferrer or pusher  $f'$ , mounted thereon and having the forked depending end  $f^3$  and a lateral projection 21, and the shaft  $d'$ , adapted to be rotated by the movement of the weft-fork in the absence of the filling, are and may be all as represented in said Patent No. 529,940, wherein like letters are used to designate the same parts, which are operated in practice substantially as provided for in said patent.

The shuttle feeler or detector  $k^2$ , connected at its upper end to one of the arms  $c^2$  of a sleeve or hub  $c$ , rotatably mounted on the stud  $f$ , the longitudinally-slotted link  $d^4$ , jointed at its lower end to an arm  $d^2$ , fast on the rock-shaft  $d'$  and connected at its upper end to a second arm on the sleeve or hub  $c$ , (not shown,) and the downturned and later-



ally-bent arm  $c^3$ , provided with a slotted finger  $n$ , the rocker-stud  $m$ , provided with a disk-like head and mounted in the forked end  $f^3$  of the transferrer, the arm  $m^2$ , fast on said stud and carrying a notched dog  $m^x$ , the lateral projection or lug  $m^4$  on the arm  $m^2$ , with which the finger  $n$  at times coöperates, the springs to normally retain the dog in inoperative position, and the bunter  $C^2$  on the lay to engage said dog and operate the transferrer when a filling-carrier is to be transferred from the filling-feeder to the shuttle by the transferrer  $f'$ , provided the shuttle is properly boxed, may be and are all as represented in United States Patent No. 568,455, dated September 29, 1896.

The finger 21, laterally extended from the outer end of the transferrer  $f'$ , is enlarged and downturned at its outer end, as at 22, and slotted, as at 23, Fig. 1, to receive therein the upturned tongue  $c^{30}$  of a cushion, (shown separately in Fig. 2<sup>a</sup>,) made preferably of rubber or other suitable yielding material, said cushion having depending and downwardly-divergent cheeks  $c^{31}$  to leave a deep V-shaped notch or recess  $c^{32}$  between them, with its open end downward, the cheeks being extended laterally beyond the tongue and upturned at each side thereof, as at  $c^{33}$ , to embrace and practically cover the edges and the correspondingly-notched lower portion of the depending end 22 of the finger.

The main portion  $f'$  of the transferrer engages, as is usual, the head end of the filling-carrier, while the tip end of the latter enters the V-shaped notch  $c^{32}$  of the cushion. This construction of the tip-engaging portion of the transferrer not only prevents any side motion of the filling-carrier during its transfer, but positively controls it during such movement.

When a filling-carrier is ejected from the shuttle, its tip will sometimes rise diagonally and fly out of the shuttle between the wall of the latter and the tip-engaging portion of the transferrer, jamming the parts so that the fresh filling-carrier cannot be properly inserted in its place. By the construction herein shown, however, the tip of the fresh filling-carrier enters and is engaged by the sides of the deep V-shaped notch near the bottom thereof before the said filling-carrier fully enters the shuttle, while the extremities of the cushion or part in which the notch is made enter the shuttle between its side walls and interpose an effective obstruction to any improper lifting movement of the tip of the spent filling-carrier, so that the latter cannot possibly fly up sidewise and jam against the shuttle-wall when ejected. Should the tip rise, it will only enter between the sides of the notch, where it can do no harm.

The cushion is so made that its laterally-projecting portions act to incase the metal of the end 22 with rubber or other yielding material at all points which might engage either the

filling-carrier, the thread, or the shuttle, so there is no possibility whatever of the filling-thread being caught between the cushion and the part of the finger to which it is attached. 70

Referring to Fig. 4, the dotted line 5 is shown as drawn through the centers of the stud  $f$  and the finger 21, while the line 6 is drawn centrally through the downturned end 22 of the finger and bisecting its notch to more clearly show that the tip-engaging portion is set at an obtuse angle with the main portion  $f'$  of the transferrer. The utility of this construction will be observed by reference to Fig. 3, wherein the tip-engaging portion 22 is shown in the shuttle, the angle at which it is set relative to the transferrer  $f'$  permitting the tip-engaging portion to enter and recede from the shuttle without touching the sides of the latter, thus effecting a more accurate and free movement of the transferrer when a filling-carrier is moved from the filling-feeder to the shuttle. A bracket  $g$ , secured to and depending from the lay adjacent the slotted shuttle-box, has pivotally mounted upon it on a stud  $g'$  the catcher for the ejected filling-carrier, said catcher being shown separately in Figs. 5 and 6 as an upturned bent arm  $H$  and having attached to its upper end, as by a bolt 12, two upturned preferably resilient or spring-jaws  $h h'$  of such length that when the catcher is in normal position the rearmost jaw  $h'$  will partly enter the slot 35 in the bottom of the shuttle-box, the tips of the jaws being slightly bent in toward each other. 100

The stud  $g'$ , which is rigidly secured to the catcher and rotatably mounted in the bracket  $g$ , has attached to it one end of a strong spring  $s^3$ , Fig. 1, the other end of the spring being secured to the bracket, the normal tendency of the spring holding the catcher in the position shown in Figs. 1 and 2, with the jaws  $h h'$  below the head end of the filling-carrier when the shuttle is in the shuttle-box. 105

The arm  $H$  is longitudinally slotted below the jaws at  $h^2$  to receive the lateral projection  $i$  on an L-shaped casting, (shown separately in Fig. 7,) comprising an expeller and a dog, which, as will be described, controls the movement of the catcher into discharging position to positively expel the filling-carrier from the catcher. 115

The upper arm  $i^2$  of the casting forms the expeller proper, and it is extended at right angles to the catcher  $H$  between the jaws  $h h'$  and is movable up and down between them, a detent  $h^3$ , shown as a thin metal plate attached to the side of the catcher, entering a longitudinal groove  $i^3$  in the projection  $i$ , preventing disengagement of the expeller from the catcher, while permitting its movement relative thereto. 120

A spring  $s^4$  is interposed between the under side of the expeller and the upper end of the catcher to normally retain the expeller in the position shown in Figs. 2 and 5, the expeller at such time being so near the opening be- 125



tween the jaws that it will be engaged and retracted or pushed in by the entrance of a filling-carrier ejected from the shuttle-box.

The main portion of the casting at right angles to the expeller forms a "dog"  $i^4$ , as it may be termed, having near its upper end a shoulder or stop  $i^5$  and a cam-surface  $i^6$ , extended from the shoulder to the lower end of the dog, while at its opposite side and at its lower end the dog is provided with a second shoulder  $i^7$ .

The catcher is located at the inner side of the bracket  $g$ , as best shown in Fig. 1, and the dog is on the inner face of the catcher, with its cam-face  $i^6$  turned toward the back of the loom and held normally by the spring  $s^4$  above an actuator (shown as a bunter  $H^x$ ) attached to the loom side A, the said bunter or actuator being preferably rounded on its under side, as at 38.

Referring now to Fig. 3, where the lay is shown as forward and with the bunter  $C^2$  in engagement with the dog  $m^x$ , the transferrer having been thereby actuated in well-known manner to transfer a fresh filling-carrier  $b$  from the filling-feeder into the shuttle S then in the shuttle-box, having a slotted bottom 35, the entrance of the fresh filling-carrier into the shuttle has operated to eject the spent filling-carrier  $b^{30}$  from the shuttle and shuttle-box and into or between the jaws of the catcher, the ejected filling-carrier depressing the expeller  $i^2$ , and thereby the dog  $i^4$ , with the lower end of the cam-surface  $i^6$  below and in the path of the actuator  $H^x$ , as clearly shown in Fig. 3, the center of the ejected filling-carrier being below the tips of the jaws  $h h'$ . Now as the lay moves back the actuator  $H^x$  will engage the dog  $i^4$  and will thereby move the catcher relatively to the lay, swinging it on its fulcrum  $g'$  into discharging position (shown in Fig. 4) just before the lay completes its backward movement, the filling-carrier still being held between the jaws of the catcher. As the lay completes its backward movement, however, the actuator will engage the shoulder  $i^5$  of the dog and will positively move the expeller  $i^2$  toward the outer ends of the jaws, carrying with it the filling-carrier  $b^{30}$ , until its center is past the tips of the jaws, whereupon the latter will tend to spring toward each other to thereby snap the filling-carrier from the catcher and preferably into a suitable box or receptacle  $B^{40}$ . (See dotted lines, Figs. 1 and 2.) The catcher having thus fulfilled its office is ready to be returned to normal position, and as the lay beats up the spring  $s^3$  will maintain the cam-surface of the dog in engagement with the actuator or bunter  $H^x$  until the lay is fully forward, and then the dog will be freed from the actuator, so that the spring  $s^4$  will immediately act to lift the lower end of the dog from the position shown in Fig. 3 sufficiently to clear the actuator on the next

backward-stroke of the lay, the spring  $s^3$  thereafter holding the catcher in normal position, so that the latter moves with the lay until another change of filling is effected, whereupon the action described will be repeated.

The toe or shoulder  $i^7$  on the front face of the dog serves as a stop to limit the movement of the expeller and dog due to the spring  $s^4$ , said shoulder or toe normally engaging the lower end of a projecting part  $h^7$  on the side of the carrier.

It is to be noted that while the catcher-jaws are preferably made resilient, with sufficient spring to snap the filling-carrier from between them, as has been described, in order to thoroughly clear the discharged filling-carrier from the catcher, said jaws are not necessarily constructed to perform such function, as in any event the expeller will positively expel the filling-carrier from the catcher.

It will be obvious from the foregoing description that the engagement of an ejected filling-carrier by the catcher acts to move the dog into operative position to cooperate with the actuator, and the dog thus forms controlling means operative by or through engagement of the catcher with the filling-carrier to control the operation of the actuator.

My invention is not restricted to the precise construction and arrangement of parts herein shown and described, as the same may be modified or rearranged in various particulars without departing from the spirit and scope of my invention. It will also be obvious that the operation of the catcher is not necessarily restricted to the particular or novel form of transferring mechanism herein shown.

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

1. In a loom, a lay having a shuttle-box slotted for the passage therethrough of a filling-carrier, a slotted shuttle, mechanism to automatically insert a filling-carrier into the shuttle while in the shuttle-box, a catcher to receive a filling-carrier ejected from the shuttle, an expeller, and means to actuate the catcher and the expeller, to thereby effect the positive expulsion of the filling-carrier from the catcher.

2. The combination with a lay, and means to eject a filling-carrier from the shuttle-box thereof, of a catcher mounted on the lay in position to engage a filling-carrier ejected from the shuttle-box, a cooperating expeller, and means to move said catcher into discharging position and to actuate the expeller to effect expulsion of the filling-carrier from the catcher.

3. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher mounted on the lay in position to engage a filling-carrier ejected from the shuttle-box, a cooperating expeller,



and means controlled as to its operation by engagement of the catcher with an ejected filling-carrier, to move the catcher into discharging position and to actuate the expeller, thereby effecting expulsion of the filling-carrier from the catcher.

4. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher movable in unison with the lay and normally positioned to engage a filling-carrier ejected from the shuttle-box, an actuator to effect relative movement of the lay and catcher, and cause the latter to assume its discharging position, and means operative by or through engagement of the catcher with a filling-carrier, to control the operation of the actuator.

5. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher to engage an ejected filling-carrier, and means to expel from the catcher the filling-carrier previously engaged by it.

6. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher movable relatively to the lay and adapted to engage an ejected filling-carrier, means to move the catcher into discharging position, and an expeller to positively remove the filling-carrier from the catcher.

7. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher movable in unison with the lay and normally positioned to engage an ejected filling-carrier, an expeller and an operatively-connected dog, mounted on the catcher, and a fixed bunter, engagement of a filling-carrier with the expeller acting to move the dog into position to be engaged by the bunter, whereby the catcher will be first moved into discharging position and thereafter the expeller will be operated to remove the filling-carrier.

8. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher pivotally mounted on the lay and normally in position to receive an ejected filling-carrier, a spring-controlled expeller carried by the catcher, a dog governed by said expeller, and a bunter to engage the dog and swing the catcher relative to the lay into discharging position when the latter engages a filling-carrier, the final movement of the dog effecting expulsion of the filling-carrier by said expeller.

9. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher movable in unison with the lay and normally positioned to engage an ejected filling-carrier, an expeller movable on the catcher and retracted by entrance of an ejected filling-carrier, a dog having a shoulder and a cam-face, and normally held by the expeller in inoperative position, and a

fixed bunter, engagement of the latter and the cam-face of the dog moving the catcher and filling-carrier away from the shuttle-box into discharging position, the engagement of the bunter and the shoulder of the dog thereafter moving the expeller to effect expulsion of the filling-carrier from the catcher.

10. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher carried by the lay and normally positioned to receive an ejected filling-carrier, and means to actuate the catcher and expel the filling-carrier therefrom, operative by or through the engagement of the catcher with a filling-carrier.

11. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher having spring-jaws to receive an ejected filling-carrier, an expeller to force the filling-carrier from between said jaws, means to move the catcher into discharging position, and thereafter to actuate the expeller and positively discharge the filling-carrier from the catcher, entrance of a filling-carrier into the jaws controlling the operation of the catcher.

12. In an apparatus of the class described, a transferrer for the filling-carrier, and a yielding cushion carried by said transferrer, the cushion having a deep, V-shaped notch therein the sides of which at or near its bottom engage the filling-carrier, the extremities of the notched cushion entering the shuttle to prevent improper lifting of the tip of the spent filling-carrier.

13. In an apparatus of the class described, a transferrer for the filling-carrier, adapted to engage the head end of a filling-carrier, a laterally-extended finger on the transferrer and provided with a downturned end having a deep V-shaped notch the bottom of which engages the filling-carrier at or near its tip end, the extremities of the downturned ends of the finger entering the shuttle to prevent improper lifting of the tip of the spent filling-carrier.

14. In an apparatus of the class described, a transferrer for the filling-carrier, and a yielding cushion carried by said transferrer to engage with the filling-carrier, said cushion having an upturned attaching-tongue and depending, downwardly-divergent cheeks extended laterally beyond said tongue and upturned at each side thereof.

15. The combination with a lay and means to eject a filling-carrier from the shuttle-box thereof, of a catcher pivotally mounted on the lay and provided with jaws and a longitudinally-movable expeller between said jaws, a spring to normally maintain the jaws of the catcher in position to receive an ejected filling-carrier, a fixed bunter, a dog on the catcher, movable by depression of the expeller into position to be engaged by the bunter upon the reception of a filling-carrier



by the catcher, the catcher being thereby  
moved into discharging position and the ex-  
peller slid outward to expel the filling-car-  
rier from the jaws, and a spring to return  
5 the expeller to normal position and withdraw  
the dog from engagement with the bunter.

In testimony whereof I have signed my

name to this specification in the presence of  
two subscribing witnesses.

JAMES H. NORTHROP.

Witnesses:

FRANK J. DUTCHER,  
HENRY LAWRENCE.