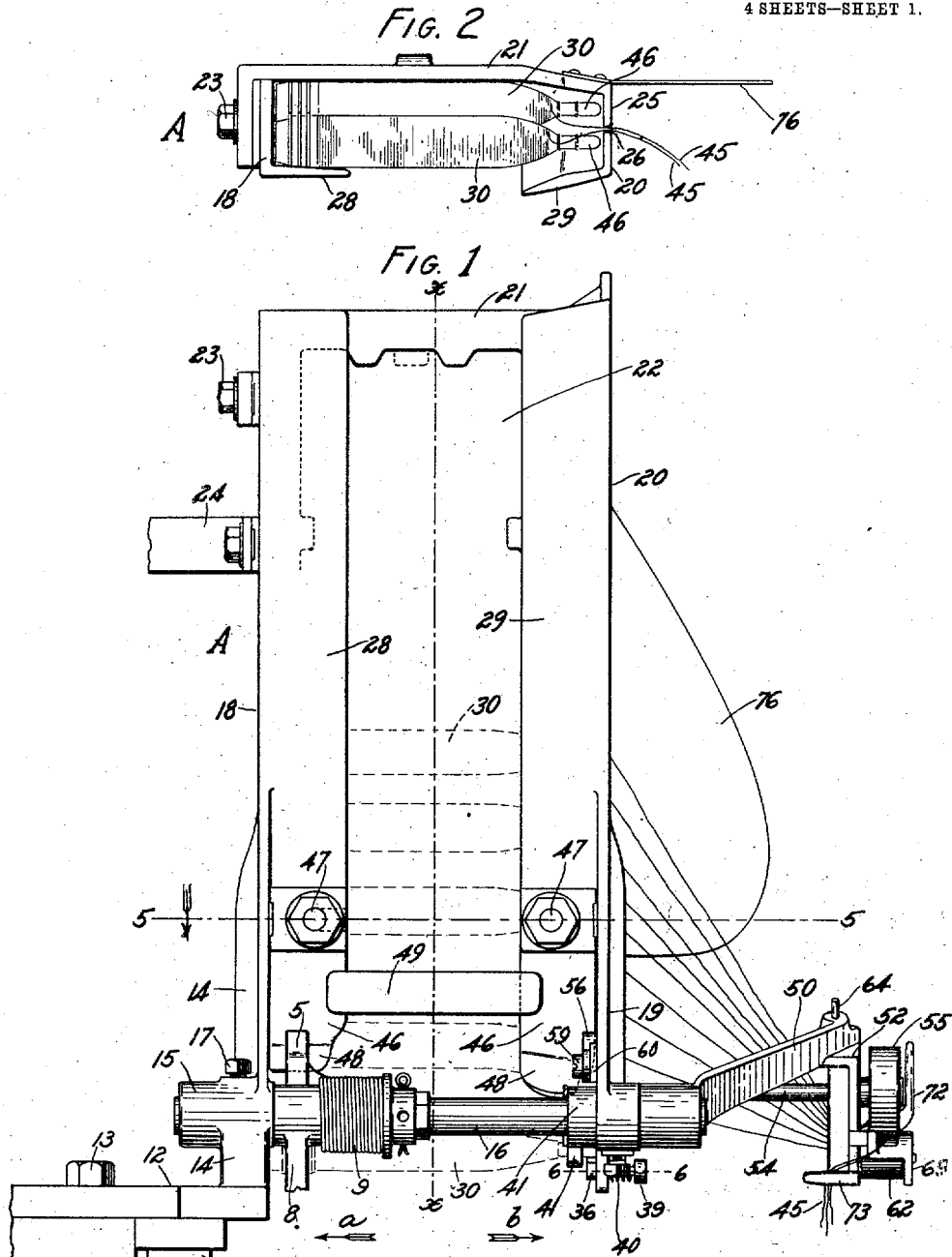


J. NORTROP.
FILLING REPLENISHING LOOM.
APPLICATION FILED JUNE 11, 1909.

956,726.

Patented May 3, 1910.

4 SHEETS—SHEET 1.



WITNESSES,

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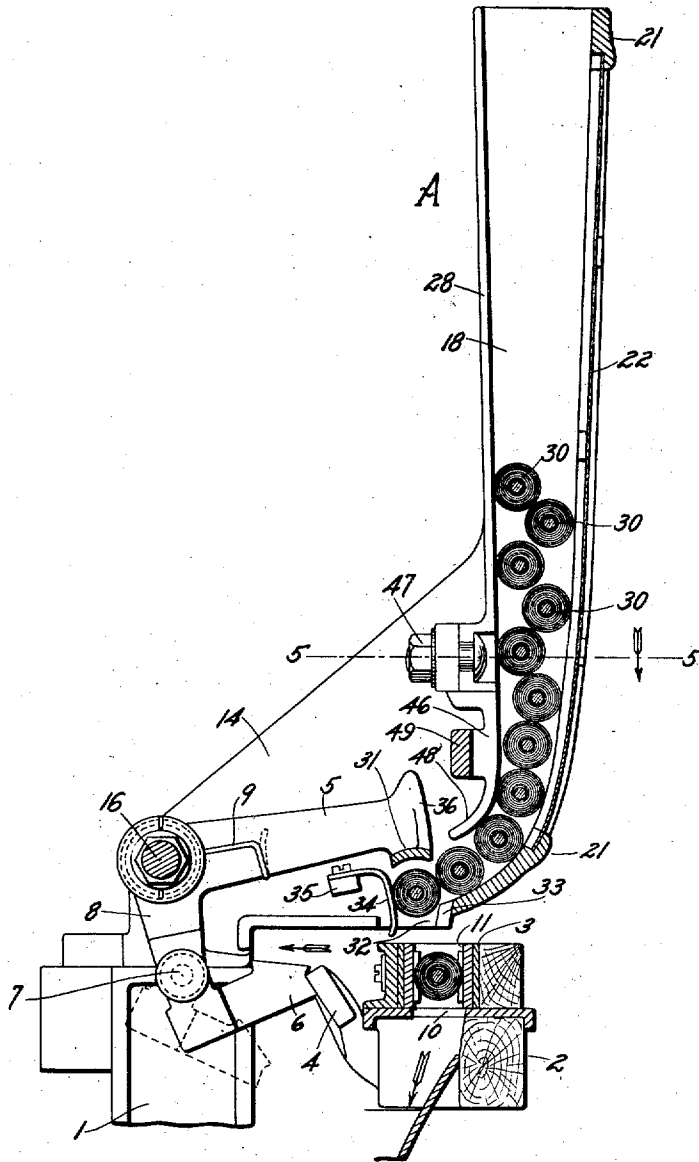
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FIG. 3



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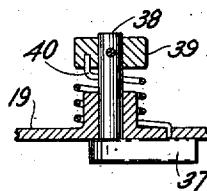
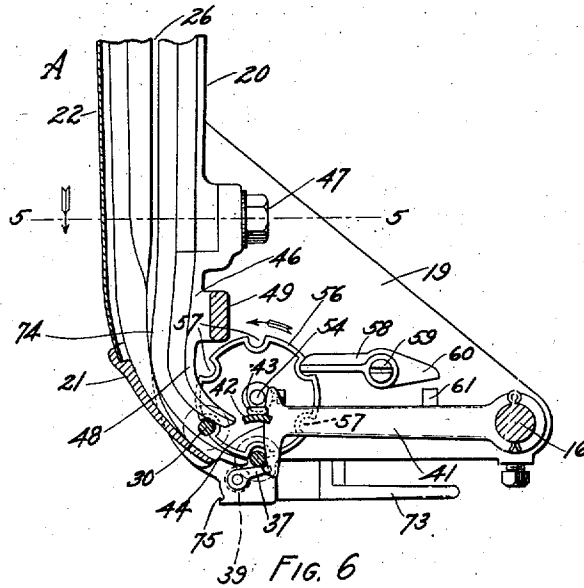
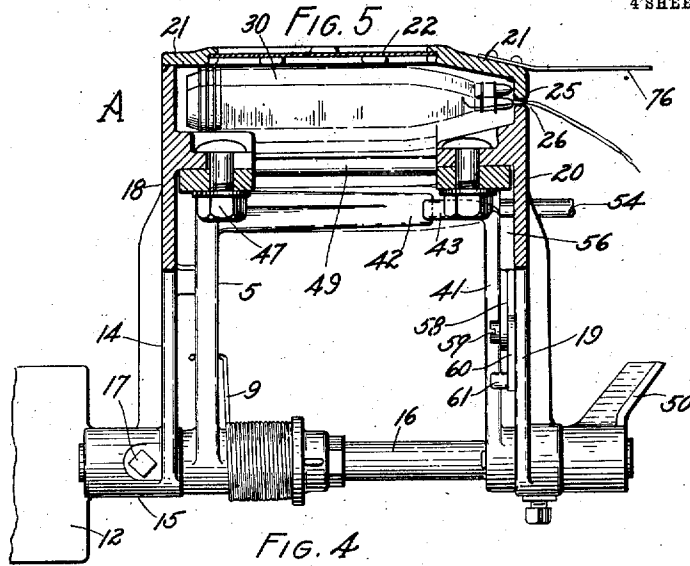
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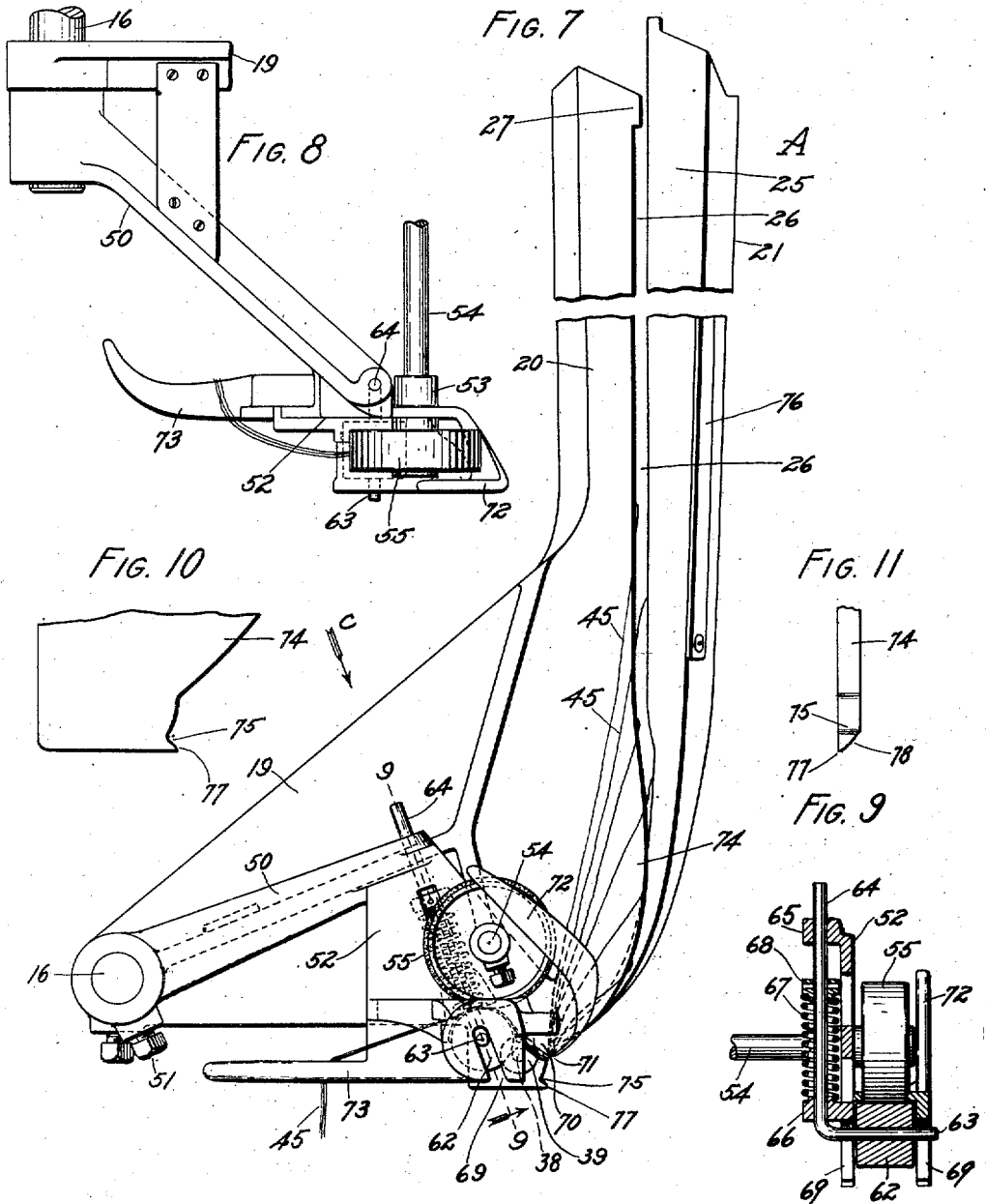
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4 SHEETS—SHEET 4.



WITNESSES,

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UNITED STATES PATENT OFFICE.

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FILLING-REPLENISHING LOOM.

956,726.

Specification of Letters Patent.

Patented May 3, 1910.

Application filed June 11, 1909. Serial No. 501,482.

To all whom it may concern:

Be it known that I, JONAS NORTHROP, a citizen of the United States, residing at Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification; like characters on the drawings representing like parts.

The invention to be hereinafter described relates to looms, and more particularly to that type known as filling replenishing looms, wherein, at desired times, a new supply of filling is furnished the weaving instrumentalities.

The aims and objects of the present invention are directed to improved means for controlling the supply of the filling carriers as they are directed to the transferring position and to the means for controlling the filling ends, all of which will best be made clear from the following description of one form or embodiment of means for carrying the invention into practical effect, it being understood that the invention is not circumscribed by such details, except as hereinafter set forth by the claims.

In the drawings: Figure 1 is a front view of the filling carrier supplying means and its associated parts, showing one form or embodiment of the present invention; Fig. 2 is a view looking into the top of the hopper and showing the relation the bobbins assume with respect to each other; Fig. 3 is a vertical section on the line *x-x*, Fig. 1, looking in the direction of the arrow *a*, Fig. 1; Fig. 4 is a like vertical section on the line *x-x*, Fig. 1, looking in the direction of the arrow *b*, Fig. 1, the top part of the hopper being broken away; Fig. 5 is a section on the line 5-5, Figs. 1, 3 and 4; Fig. 6 is a sectional detail of the bobbin tip supporting finger on line 6-6, Fig. 1; Fig. 7 is a side view of the hopper and its associated parts, looking from the right of Fig. 1; Fig. 8 is a view of the filling end controller, looking in the direction of the arrow *c*, Fig. 7; Fig. 9 is a sectional detail on the line 9-9, Fig. 7; and Figs. 10 and 11 are detached detail views in side and edge elevation showing the filling end guide and support for the filling leading from the carrier next to be transferred.

The loom frame 1 having any usual or

desired form of breast beam, the lay 2 having the shuttle box 3 and bunter 4 adapted to actuate any usual or desired character of transferer 5 through the medium of the transferer dog 6, shown as pivoted at 7 to the arm 8 of the transferer, the spring 9 normally acting to maintain the transferer in raised position, and other associated parts acting to effect a replenishment of filling at desired times may be of any usual or preferred construction, it being understood that the present invention is not restricted in any respect to these features.

In the present embodiment of the invention the shuttle box 3 is shown as provided with the usual open bottom 10, through which the filling carrier leaving the shuttle 11, Fig. 3, may pass as the fresh filling carrier is moved into the shuttle by the transferer.

Mounted conveniently on the breast beam or loom frame is a bracket 12, Fig. 1, shown as secured in place by suitable bolt connection 13, and furnishing a support or sustaining element for the filling carrier supplying means or hopper, which, as an entirety, may be identified by A in Figs. 1, 2, 3, 4, 5 and 7.

Rising from the bracket or support 12 is the web or flange 14, Figs. 1, 3 and 5, having a bearing 15 for a stud shaft or arm 16, which may be suitably secured thereto, as by the set screw 17. The web 14 is extended rearward, as shown in Fig. 3, and supports one end wall 18 of the hopper A. Secured to the stud shaft or arm 16 is a web 19, Figs. 1, 4, 5 and 7, similar; it may be, to the web 14 and furnishing a support for the other end wall 20 of the hopper A. The two end walls 18 and 20 of the hopper may be joined together at the rear by any suitable means to form a rigid structure and are preferably so connected by a covering to protect the filling carriers from oil or flying dirt from the moving parts of the loom. In the present form of the invention the joining element is a frame 21, Figs. 1, 2, 3, 4 and 5, extending across the top and bottom and along the rear of the side walls 18 and 20 of the hopper, and furnishing a sustaining frame or seat for a rear cover plate 22, Figs. 1, 3, 4 and 5, which may be of light sheet metal. The frame 21 may be connected to the end wall 18 of the hopper by suitable bolts 23 or the like, and the hopper as a whole be braced,

if desired, by an arm 24, Fig. 1, secured to a fixed part of the loom frame. The frame 21 has a flange 25, Figs. 2, 5 and 7, turned toward the end wall 20 and which in connection with the end wall 20 forms a support and guide for the tip ends of the filling carriers, as indicated, the flange 25 and wall 20 forming between them a slot 26, Figs. 2, 4, 5 and 7, through which the filling ends extend, the walls of the slot being prevented from coming together and clamping the filling ends by appropriate means, such as the bulb or enlargement 27, Fig. 7, formed on or extending from one of them. The end walls 18 and 20 of the hopper have flanges 28 and 29 respectively, which, with said end walls and rear covering or plate, complete a suitable form of hopper and guide for the filling carriers 30 as they move toward the filling transferring position beneath the end 31 of the transferer 5, Fig. 3. At its lower portion the hopper A is turned or curved so as to guide the filling carriers 30 to proper transferring position, Fig. 3, at which point the hopper adjacent the heads of the bobbins is provided with a throat or passageway 32, the rear wall 33 of which is substantially fixed or stationary, and the front wall of which may be formed yielding in any suitable manner, as by a spring 34 secured to an arm 35 projecting from the flange 14 of the hopper support. It will be noted that the spring 34 forms a stop for the filling carrier next to be transferred, and normally obstructs the throat or passageway 32 so that the bobbin next to be transferred will be sustained in transferring position until the transferer is actuated, at which time the stop 34 will yield and permit the filling carrier to pass through the throat or passageway into the shuttle beneath. As the transferer thus pushes the carrier into the shuttle, its upwardly extending head portion 36 serves to prevent the remaining filling carriers from descending until after the transferer has again returned to normal position, at which time the column of filling carriers in the hopper will move downward until the carrier next to be transferred meets the yielding stop 34. At the tip end the filling carrier next to be transferred is sustained by a yielding finger 37, Figs. 4 and 6, having a stem 38 extending through the web 19 on which is fixed a collar 39, Fig. 6, having one end of a spring 40 secured thereto, the other end of the spring being secured to the web or other fixed part, the construction being such that as the filling carrier is transferred to the shuttle, the finger 37 will yield downward and direct the tip of the filling carrier into the shuttle.

As one form of means for stopping the tip ends of the filling carriers, as they successively move to transferring position and

maintain the column of filling carriers from downward movement during the act of transferring, an arm 41 having a stop head 44, Figs. 4 and 5, is loosely mounted on the stud shaft 16 and caused to move with the transferer by appropriate or suitable means, as, for instance, a lug 42, Fig. 4, extended from the transferer, on which rests a projection 43 extending from the stop head 44.

Regardless of details in the structural formation of the hopper or filling carrier supply, it is desirable for the best results that the filling carriers be prevented from rotative movement on their axes during their travel to transferring position, and it is also of importance that the filling end leading from one carrier be not engaged with the tip end or other portion of another filling carrier during such travel. In filling carrier hoppers constructed as heretofore, much difficulty has been experienced from such rotative movement of the carriers and also from the filling ends becoming engaged with the tips of other carriers or bobbins. With these facts in mind the present invention aims to provide a filling carrier supplying means in the general form and character of a hopper wherein provision is made for overcoming these defective and objectionable conditions. In these respects the present form of the invention embodies a hopper the upper portion of which is made sufficiently wide from front to rear to permit the filling carriers to assume a staggered relation with respect to each other, as indicated in Fig. 3, and the lower portion of which is contracted from front to rear that the carriers, as they approach transferring position, may be arranged in single file. The effect of thus constructing the hopper is that in the portion where the hopper is relatively wide from front to rear the filling carriers 30 will wedge against each other and alternately against the front and rear walls of the hopper, so that in their progression toward the transferring position at the bottom of the hopper they will move as a body without axial rotation of the individual elements or carriers composing it. By this construction also, as shown by Fig. 2, and the alternate disposition of the filling carriers at the front and rear of the hopper, the filling end 45 leading from a filling carrier above will not be directly over the tip portion 46 of the filling carrier next below it, as would be the case if the filling carriers were in single vertical file, and consequently the tip of the lower filling carrier will not catch the loop of filling end leading from the carrier next above it, a condition which would cause a break in the filling of the upper carrier when the lower carrier was transferred or when the carriers assumed single file relation as they move toward transferring position. These characteristics of the present inven-

tion are of great practical importance, and this is the first instance, so far as known, where a hopper for the supply of filling carriers has been devised with an upper portion to cause the carriers to assume a staggered and wedging relation to prevent axial rotation thereof as they move to transferring position, and where engagement of a filling end leading from an upper filling carrier by the tip of a filling carrier below it has been prevented. In the present embodiment of the invention as to these features the hopper is made flaring from the lower to the upper portion, Figs. 3 and 7, so that the filling carriers may alternately wedge between the next adjacent carrier and front and back wall of the hopper, and the lower portion of the hopper A is gradually contracted in width from front to rear to cause the carriers to automatically adjust themselves into single file for presentation singly to transferring position. This gradual contraction of the hopper may be formed by curving the rear protecting cover, and the front of the hopper at this point may be formed of the finger or flange portions 46 detachably connected to the end wall flange portions 28 and 29 by the bolts 47, the flange portions 46 being formed with frontwardly curved lower ends 48 connected by a brace 49 and directed toward the transferring position to complete the front wall of the guiding path for the filling carriers. As the filling carriers move downward in the hopper toward transferring position, it is desirable that the slack that would be caused in the filling ends if the terminal parts were secured to a fixed support be taken up, and for this a filling end controller is provided which will act upon the filling ends in response to the downward movement of the filling carriers in the hopper to take up all slack.

One form of filling end controller is shown, but it will be understood that the invention is not restricted thereto.

Secured to the end of the stud shaft or rod 16 by means such as a set screw 51 is a supporting arm 50, Figs. 1, 5, 7 and 8, which furnishes suitable sustaining means for a bracket or plate 52 and its connected parts. Formed in or connected to the plate 52 is a bearing 53, Fig. 8, for a controller shaft 54 carrying at its outer end a wheel 55, said shaft being extended through a bearing in the web 19 and having secured thereto an actuator 56. The actuator 56 is provided with a series of seats or recesses 57 to receive the tip ends of and be actuated by the filling carriers 30 as they move toward transferring position, as indicated in Fig. 4. The actuator 56 serves to actuate the shaft 54 as the filling carriers move to position of transfer, or in other words to cause the shaft 54, and consequently the wheel 55, to turn in

response to downward movement of the filling carriers and take up slack in the filling ends, as will presently appear. A stop pawl 58 pivoted at 59 serves to prevent backward movement of the actuator 56, and a toe 60 on the pawl avoids excessive uplift of the pawl end by engagement with the stop 61, Figs. 4 and 5.

Disposed below the wheel 55, which may be faced with a fabric or cover of suitable character, is an idle roll 62, Figs. 7 and 9, carried by an arm 63 projecting from the rod 64 which is movable in bearings 65 and 66 and is surrounded by a spring 67 acting against the collar 68 to normally lift the rod 64 and maintain the idle roll 62 in contact with the wheel 55. The arm 63 is or may be guided in suitable slots 69 formed in a portion of the plate 52.

The bracket or plate 52 has an arm 70 projecting rearwardly therefrom to provide a guide recess 71, Fig. 7, for the filling ends which after passing under said guide extend into the nip between the wheel 55 and idle roll 62, the arm 70 being extended backward, upward, and over the side face of the wheel 55 to act as a guide 72 for the filling ends, as the operator passes them under the guide recess 71 and between the wheel 55 and idle roll. Projecting frontwardly of the wheel 55 and roll 62 is a finger or filling end support 73 over which the free ends of the filling pass as they are drawn between the wheel and idle roll.

It will be noticed, Fig. 7, that the front wall of the slot 26, through which the filling ends are passed, has a decided rearward bulge or swell 74 near its lower portion where the filling carriers pass into single file in approaching the transferring position, and that the lower terminal portion of said bulge has a recess or guide 75, see dotted lines Fig. 7 and full lines Fig. 4, the purpose whereof is to insure sufficient filling between the carrier next to be transferred and the point where the filling end is held, as, for instance, the nip of the wheel and roll, so that at the moment of transfer the filling will not be broken. As the filling carriers move toward transferring position, the filling ends leading from the upper carriers in the hopper will furnish more slack to be taken up by the filling end controller than the filling ends leading from the carriers nearer the lower portion of the hopper, as will be obvious, and, by the simple expedient described as one embodiment of this feature of the invention, sufficient length of filling end is maintained between the carrier and the filling end controller to respond to all demands for slack filling at the moment of transfer. It will be noted from Fig. 4 that the filling end leading from the filling carrier, at the time being in position to be next transferred, passes backward somewhat

to the recess or guide 75 and then to the nip between the wheel 55 and roll 62, or in other words it is given a circuitous path between the bobbin or carrier and the point where the filling end is held, so that while sufficient filling for the transfer is insured it may still be held taut between the carrier and filling end controller. As shown in Fig. 1, the filling ends leading from the filling carriers in the hopper to the end controller or take-up pass in front of a guard plate or wing 76, whereby the suction or air disturbance due to moving parts of the loom will be prevented from disturbing or acting injuriously upon the filling ends.

As best shown by the detail views, Figs. 10 and 11, the guide 75 has projecting below it and to the rear, a supporting toe 77 which serves to support the filling end between the carrier next to be transferred and the point where the end of the filling is held, and in order that the filling end may readily slide off the supporting toe as the carrier is transferred, its upper surface is preferably inclined and the inner side edges thereof are cut away or rounded, as at 78.

It will be noted that the slack in the filling ends will be taken up by and in response to the movement of the filling carriers as they pass successively along the hopper to the transferring position, and that the relation of the filling carriers in the hopper is such that they wedge together, preventing individual rotative movement, and that the filling ends lead alternately from the front and rear of the hopper so that interference of the carrier tips with the filling and consequent breakage of filling ends is entirely avoided.

Obviously the invention is not limited to the particulars and details described, as changes in form, character, and relation of parts may be made within the spirit of the invention which is definitely pointed out by the claims.

What is claimed is:

1. In a filling replenishing loom, a filling carrier supply hopper having a lower portion to contain filling carriers in single line formation, and an enlarged upper portion to contain filling carriers in staggered relation and cause the filling carriers to wedge between each other and an adjacent wall of the hopper.

2. In a filling replenishing loom, a filling carrier supply hopper formed with a compartment having a lower portion to contain filling carriers in single line formation, and an upper portion to contain filling carriers in plural line formation.

3. In a filling replenishing loom, a filling carrier supply hopper formed with a single compartment having a lower portion to deliver filling carriers singly to transferring position, and an upper portion to contain

filling carriers in plural line formation with the carriers disposed in staggered relation.

4. In a filling replenishing loom, a filling carrier supply hopper having a lower portion to deliver filling carriers singly to transferring position, and an enlarged upper portion to contain filling carriers in plural line formation, said enlarged upper portion gradually contracting downward into the lower portion to arrange the filling carriers in single line formation as they move toward transferring position.

5. In a filling replenishing loom, a filling carrier supply hopper provided with an enlarged upper portion to contain filling carriers in staggered relation, and having a slot for the passage of the filling ends.

6. In a filling replenishing loom, a filling carrier supply hopper having a lower portion to contain filling carriers in single line formation, and an upper portion to contain filling carriers in plural line formation and staggered relation, the end wall of said hopper having a slot for the passage of filling ends.

7. In a filling replenishing loom, a filling carrier supply hopper having a slot for the passage of the filling ends, means for taking up slack filling as a carrier moves to transferring position, and means to provide sufficient length of filling end between the take up and filling carrier to prevent breakage during transfer.

8. In a filling replenishing loom, a filling carrier supply hopper having a slot for the passage of the filling ends, means for taking up the slack filling as the carriers move downward in the hopper, and means for maintaining a length of filling between a carrier and the point where the filling end is held to provide sufficient length of filling end to prevent breakage during transfer.

9. In a filling replenishing loom, a filling carrier supply hopper provided with an enlarged upper portion to contain filling carriers in staggered relation, and having a slot for the passage of the filling ends, one of the walls of said slot having a projecting portion about which the filling from a carrier passes as it moves to transferring position.

10. In a filling replenishing loom, a filling carrier supply hopper having a slot for the passage of the filling ends, means for providing a length of filling between a carrier as it moves to transferring position and the point where the filling end is held to provide sufficient filling end to prevent breakage during transfer, and a guide adjacent the transferring position for the filling leading from the filling carrier for the time being in transferring position.

11. In a filling replenishing loom, a supply hopper having a slot for the passage of the filling ends, one wall of said slot having

a bulge or enlargement at its lower portion over which the filling end of the carrier next to be transferred moves as the said carrier passes to transferring position.

5 12. In a filling replenishing loom, a supply hopper having a slot for the passage of the filling ends, one wall of said slot having a bulge or enlargement at its lower portion over which the filling end of the carrier next
10 to be transferred moves as the said carrier passes to transferring position, said wall having a guiding recess adjacent the transferring position through which the filling end from the carrier next to be transferred
15 passes.

13. In a filling replenishing loom, a hopper for containing filling carriers and provided with a slot for the passage of the filling ends, a wall of said slot having a guiding recess for the filling leading from the bobbin next to be transferred, said guiding recess being disposed to one side of the carrier transferring position.

14. In a filling replenishing loom, a hopper for containing filling carriers and provided with a slot for the passage of the filling ends, a wall of said slot having a guiding recess for the filling leading from the bobbin next to be transferred, said guiding
30 recess being disposed to one side of the carrier transferring position, and means for holding the end of the filling.

15. In a filling replenishing loom, a filling carrier supply hopper, comprising end walls,
35 a rear covering extending between the rear portions of said walls and having a lower portion turned frontwardly toward transferring position, and a guard plate extended from one end of the hopper to protect the
40 filling ends passing therefrom.

16. In a filling replenishing loom, the combination of a filling supply hopper having provisions for guiding filling carriers to transferring position and a throat for the
45 passage of a filling carrier as it is transferred, a filling end controller for taking up the filling ends as the carriers move toward transferring position, and an actuator for said controller engaged and moved by the
50 tips of the filling carriers as they move to transferring position.

17. In a filling replenishing loom, a hopper provided with an upper portion for containing filling carriers in double line formation
55 and a lower portion for containing carriers in single line formation, said hopper

having a slot for the passage of filling ends leading alternately from carriers at the rear and front of the hopper, and a filling end controller for taking up the filling ends as
60 the carriers move downward in the hopper.

18. In a filling replenishing loom, the combination of a hopper for containing a supply of filling carriers, a rotary take-up for the filling ends as the carriers move in the hopper, an actuator for said take-up operative
65 upon each replenishing action of the loom, and means for preventing reverse rotation of the rotary take-up.

19. In a filling replenishing loom, the combination of a hopper for containing a supply of filling carriers, a rotary take-up for the filling ends as the carriers move in the hopper, an actuator for said rotary take-up, and means to prevent reverse rotation of the
70 rotary take-up.

20. In a filling replenishing loom, a supply hopper having a slot for the passage of the filling ends, one wall of said slot having a bulge or enlargement at its lower portion
80 over which the filling end of the carrier next to be transferred moves as the said carrier passes to transferring position, and a supporting toe for the filling end leading from the filling carrier when in transferring position.
85

21. In a filling replenishing loom, a supply hopper having a slot for the passage of filling ends, a wall of said slot having a guiding recess for the filling leading from
90 the carrier next to be transferred.

22. In a filling replenishing loom, a supply hopper having a slot for the passage of filling ends, a wall of said slot having a guiding recess for the filling leading from
95 the carrier next to be transferred, and a supporting toe below said guiding recess.

23. In a filling replenishing loom, a supply hopper having a slot for the passage of filling ends, a wall of said slot having a
100 guiding recess for the filling leading from the carrier next to be transferred, and a supporting toe formed to permit the filling to slide therefrom as the carrier is transferred.

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

JONAS NORTHROP.

Witnesses:

EVERETT L. WOOD,
WENDELL WILLIAMS.