

J. NORTHROP.
FILLING REPLENISHING LOOM.
APPLICATION FILED JUNE 22, 1910.

1,014,844.

Patented Jan. 16, 1912
3 SHEETS—SHEET 1.

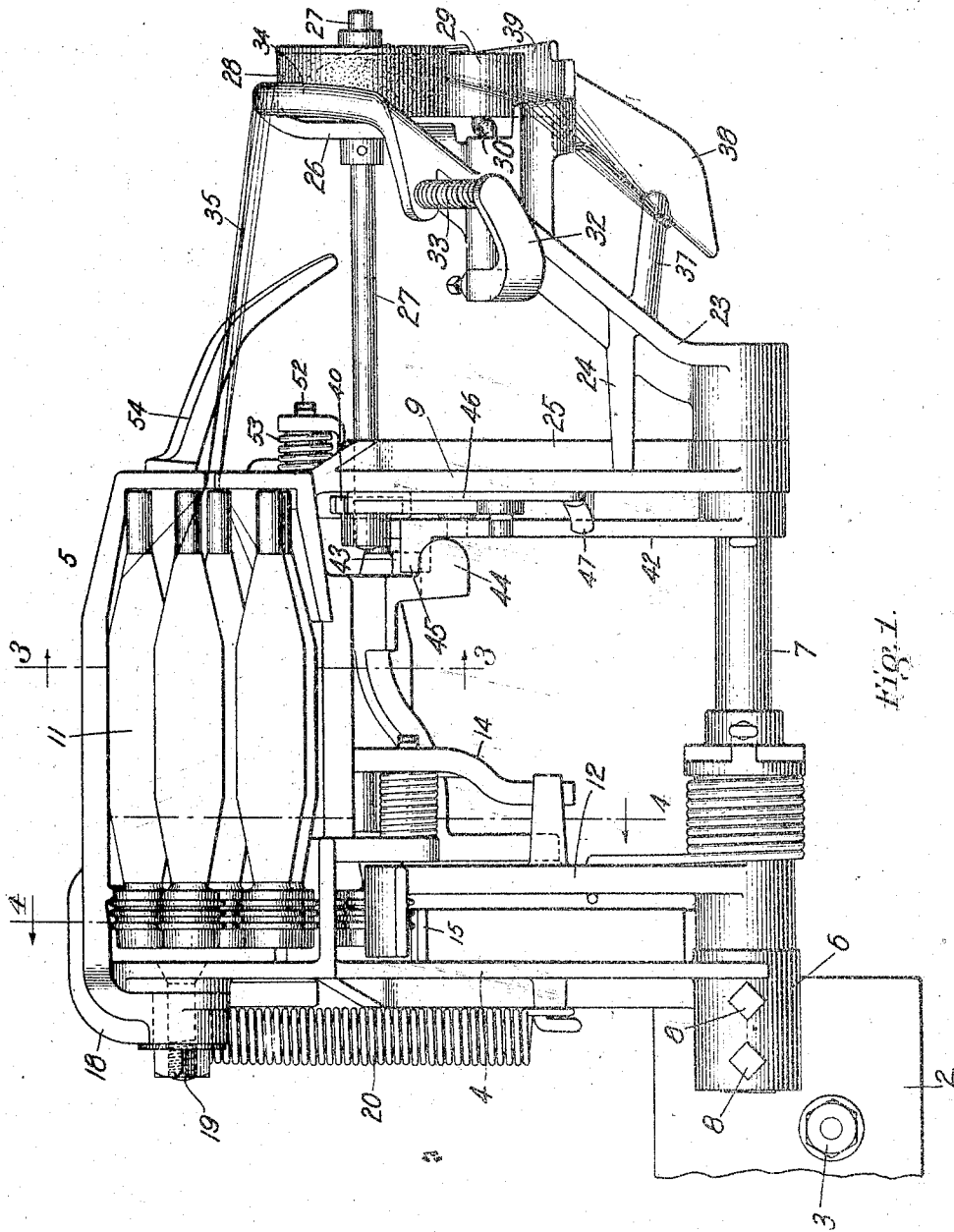


Fig. 1.

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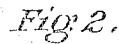
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3 SHEETS—SHEET 2.

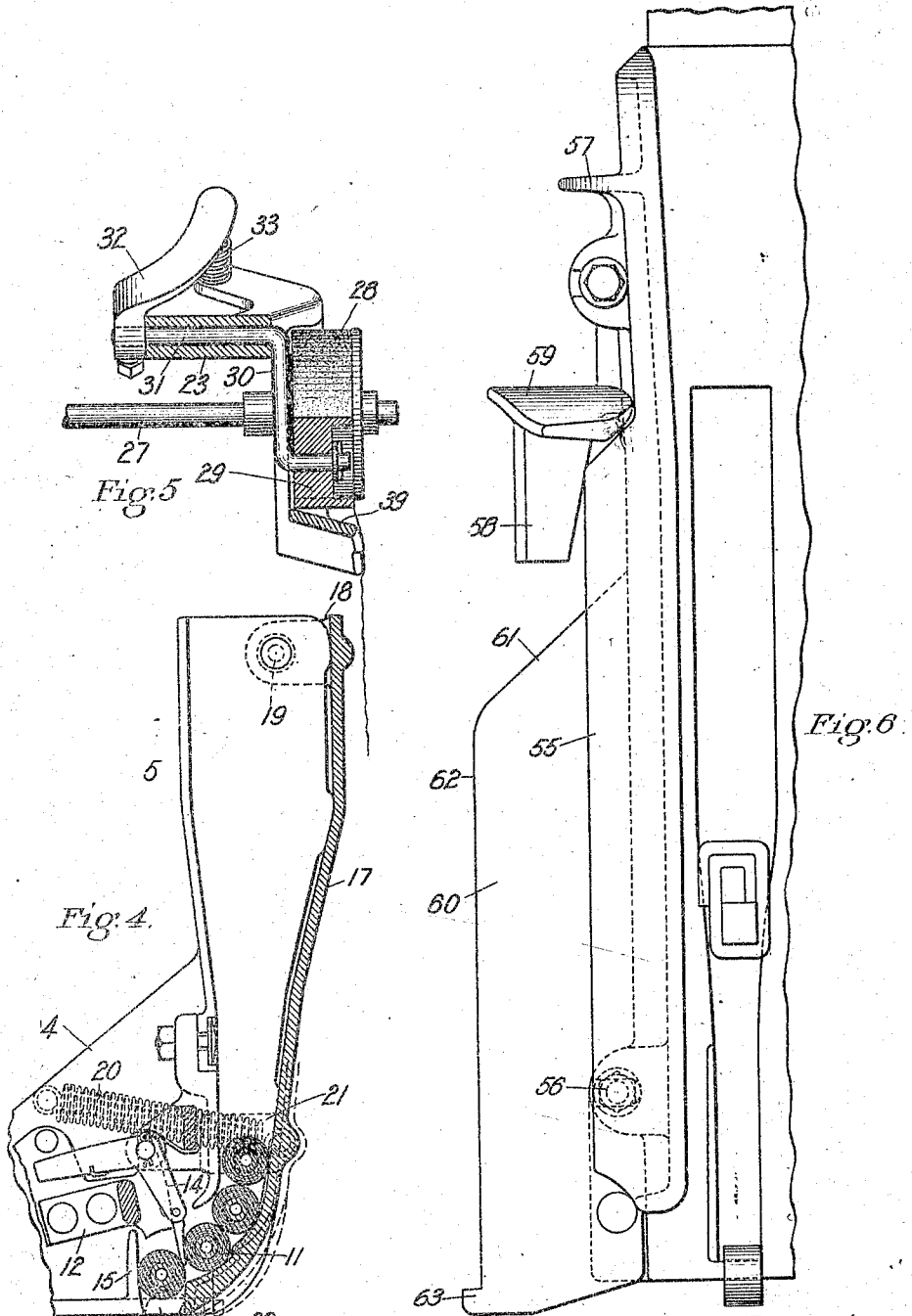


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UNITED STATES PATENT OFFICE.

JONAS NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DRAPER COMPANY, A CORPORATION OF MAINE.

FILLING-REPLENISHING LOOM.

1,014,844.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed June 22, 1910. Serial No. 568,290.

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 letters on the drawings representing like parts.

The invention to be hereinafter described relates to looms and more particularly to looms of the filling replenishing type, wherein at times a fresh supply of filling is furnished automatically. In this type of loom much trouble has been experienced in properly controlling the end of the filling threads leading from the carriers in the supplying means. On the one hand, the ends of the filling threads must be held at some point in order that filling be laid by the shuttle on the first pick after replenishment and the shuttle be threaded automatically. On the other hand these ends are liable to be caught by the lay or some of the operating parts, particularly should they become slack from any cause, and, when finally broken or cut at or near the cloth selvage, they may be carried or thrown into the shed by the shuttle or picker stick. In some cases these thread ends have been led from the filling carriers in the supplying means to a fixed stud about which they have been wound, but regardless of whether means were provided to take care of any slack occurring between the carriers in the supplying means and the stud, these thread ends when severed at or near the selvage would dangle in the path of the lay or picker stick with consequent liability of being carried or thrown into the shed. Another serious objection resulted from the constant accumulation of waste ends about the stud in that it required to be cleaned frequently, and often before the operative would get around to clean the stud, it became so clogged that the new thread ends wound on it when the supplying means was refilled would not remain in proper position, thus causing "misthreads" when the filling carriers were transferred to the shuttle. These troubles have become so serious in some mills, particularly those using coarse filling, that many attempts have been made to overcome them, but without success.

With the above and other matters in view, the present invention has for its general object to provide a loom wherein the filling ends extending from the filling carriers may be properly controlled at all times without liability of catching on any of the loom parts, and when a filling end is finally severed after its carrier has been transferred, it may be automatically retired from connection with the loom and dropped from its holding means. These and other aims and objects of the invention will best be made clear from the following description and accompanying drawing of one form of means for carrying the invention into practical effect, it being understood that in matter of details the invention may take many forms and that other means than those shown may be employed to carry the invention into effect within the true character thereof as defined by the claims.

In the drawings:—Figure 1 is a plan view of one end portion of a loom embodying one form of the invention. Fig. 2 is an end view at the filling replenishing side of a loom containing the present invention, only so much of the loom being shown as is necessary to properly indicate the association of the invention therewith; Fig. 3 is a detail sectional view on the line 3—3. Fig. 1; Fig. 4 is a like sectional view on the line 4—4. Fig. 1; Fig. 5 is a sectional view of the thread take-up and one form of means for retiring a thread after it has been severed from its carrier; and Fig. 6 is a top or plan view of the shuttle box at the filling replenishing side of the loom.

The loom frame 1 may be of any usual or desired character to which is secured the bracket 2 by suitable means, such as the bolt and nut 3, said bracket having in the present form of the invention a web 4 acting as one of the supports for a filling carrier supplying means or hopper 5. Sustained by a bearing 6, Fig. 1, is a rod or stud 7 secured by bolts 8, 8, or other appropriate means, and affording a support for a web 9 which may sustain a part of the hopper 5. The hopper 5 may obviously be supported in any manner desired, the webs 4 and 9 constituting only one of the various means which may be employed.

The hopper 5 is preferably of the character shown, wherein filling carriers may be

sustained in staggered or plural line formation, although features of the present invention may be employed with other types of filling supplying means. At its lower portion the hopper 5 is provided with a throat 10, Fig. 4, through which the filling carrier 11 may be forced by a transferer 12, Figs. 1 and 4. This transferer may be of any desired character, its function being to force a filling carrier 11 through the throat 10 and into a shuttle at desired times. In the present representation, the transferer is shown as mounted on the stud or rod 7, Figs. 1 and 2, and provided with an arm 13, Fig. 2, which, when the filling is to be changed, may be actuated in a manner well understood by those skilled in the art, and substantially as pointed out by my prior application Ser. No. 516,240. If desired also a filling carrier positioner 14, Fig. 4, such as fully described in my said application or otherwise, may be employed to move a filling carrier into position for passage through the throat 10. The throat 10 has a fixed front wall 15, and a movable back wall 16, the normal dimensions of the throat being too small to permit passage of a filling carrier therethrough. In order, however, to permit a carrier to pass through the throat when forced downward by the transferer, the back wall 17 of the hopper is mounted to yield. This yielding action is preferably secured by forming a lug 18 on the back wall of the hopper and pivotally mounting the lug at 19, Figs. 1 and 4, to a fixed part, such as an end wall of the hopper, so that the back wall may swing about a center preferably near its upper portion. The back wall may be normally retained in position as indicated by full lines, Fig. 4, that is in position with the throat 10 closed to the passage of a filling carrier, by means of a spring 20, Figs. 1 and 4, suitable guiding flanges 21 being provided to guide the back wall 17 as it is moved. The lower portion of the back wall 17, Fig. 4, is turned forward and if desired may be provided with a guiding notch to engage a lug or projection 22 on the end frame of the hopper, the construction and arrangement being such that as the transferer forces a filling carrier through the throat 10, the back wall of the hopper may swing about its pivotal mounting against the tension of the spring 20, and be suitably guided in its yielding action toward and from the front wall of the hopper. When filling carriers are in the hopper, it will be apparent that this back and forth movement of the back wall will serve to agitate such carriers sufficiently to insure their proper movement toward transferring position and their passage into single line formation in the lower part of the hopper. As the filling carriers move downward in the hopper toward transferring position, it

is apparent that slack will be produced in the filling ends if the terminal portions thereof are secured or held at a point in a plane near the lower portion of the hopper; and slack may sometimes occur in the individual threads by unwinding from the individual carriers. The present invention, in addition to means for taking up such slack either in the series of filling threads or in any individual threads, contemplates means for separating or retiring any thread end that may become broken or severed, as for instance after a transfer when the filling end is cut or broken at or adjacent the cloth selvage, and as one means to these ends the following has been devised. Mounted on the rod or stud 7, Fig. 1, is a bracket arm or support 23 having a lug or finger 24 which rests upon the ledge 25 of the web 9. The arm 23 has a projecting portion 26 in which is provided a bearing for a shaft 27 extending through the web 9 and carrying at its outer end portion the take-up wheel 28, Figs. 1 and 2. The take-up wheel 28 is preferably provided with a yielding surface which may appropriately be formed of felt, cloth, or other suitable material. In cooperating relation with the take-up wheel 28 is a wheel 29 mounted on an arm 30 which has a portion 31 bearing in the bracket arm 23, Figs. 1, 2 and 5, the portion 31 of said arm being conveniently formed with a finger 32 against which acts the spring 33, the construction being such that the spring 33 normally acts to force the wheel 29 into cooperating relation with the take-up wheel 28. Extending from the bracket arm 23 is the thread guide and separator 34, over which the filling ends 35 pass from the filling carriers 11 in the hopper to the "bite" between the take-up wheel 28 and the wheel 29. The thread guide and separator is curved about the take-up wheel 28 so that the series of thread ends leading from the carriers to the take-up wheel may be held in separated and spread relation, as shown in Fig. 2. From the thread guide and separator 34 the spread and separated threads 35 pass about the take-up wheel 28 between it and the wheel 29 and then pass over another guide 36, Fig. 2.

By the construction thus far described it will be apparent that the threads do not pass between the take-up rolls in a bunched relation but maintain a substantially separated or spread condition, and that this condition may be further maintained by the guide 36. From the guide 36 the thread ends 35 may pass about a guide 37, Figs. 1 and 2, said guide 37 projecting from the arm 23 and being itself connected to an arm 38 projecting from the spreader guide or other stationary support, the construction being such that the threads, after being spread by the guides 34 and 36, are bunched

together at the union between the guide 37 and part 38, said part 38, while forming with the guide 37 a receiving notch at their junction, has its end portion extended downwardly somewhat, as indicated in Fig. 2.

Projecting below the take-up wheel 28 and the wheel 29 is a deflector 39, Figs. 2 and 5, the edge portion of which, see Fig. 5, projects beyond the plane passing through the end faces of the take-up wheel 28 and wheel 29. The deflector 39 may be of any usual or desired character, but is herein represented as extending from or between the lower part of the two guides 34 and 36, though, as will be obvious, it may be variously formed. From the construction described, regardless of the particulars thereof, it will be apparent that, if a filling end becomes broken and hangs downward, as indicated in Figs. 2 and 5, such filling end will pass over the edge of the deflector 39, and as the wheels 28 and 29 rotate, as will hereinafter appear, such deflector will cause the severed end to pass from between the nip of the wheels 28 and 29 and drop downward, where such ends may be finally collected in a suitable receptacle, if desired.

As a means for causing rotation of the take-up roll 28 and perforce its coacting roll 29, the shaft 27 has secured thereto inside of the bracket 9, Figs. 1 and 3, a ratchet wheel 40, the ratchet teeth of which are adapted to be engaged by the end of a pawl 41 carried by the arm 42 loosely mounted upon the rod or stud 7, Fig. 2. This arm 42 may be of the general character set forth in my prior application, Ser. No. 516,240, filed September 4, 1909, wherein the transferer is shown and described as provided with suitable lugs for containing between them a projecting portion of the arm 42, the construction being such that when the transferer moves in transferring a carrier from the hopper to the shuttle, the lower one of these lugs will move downward and permit the arm 42 to drop downward and substantially in the line of the upper surface of the shuttle box, and, as the transferer rises after a transfer, said lug will lift the arm 42 into its upper position again. In the present form of the invention, as best shown by Figs. 1 and 3, the transferer has the lugs 43, 44, between which is disposed the lug 45 of the arm 42, Fig. 1, the action of such parts being substantially as indicated in said prior application. From the construction thus described it will be apparent that when the transferer moves down in transferring a carrier from the hopper to the shuttle, the arm 42 will be lowered and the pawl 41 will move over the ratchet 40 into engagement with the next ratchet tooth, whereupon, by upward movement of said arm 42 as the transferer returns to initial position, the shaft 27 and perforce

the take-up wheels 28 and wheel 29 will be caused to rotate to take up both collectively and individually the slack in the filling ends leading from the filling carriers. In order that the ratchet 40 and the shaft 27 may not be turned in reverse direction, there is provided a holding pawl 46, Fig. 3, which, as the arm 42 and pawl 41 move down to their lowered position, will hold the ratchet 40 from rotative movement but permit such ratchet to rotate contra-clockwise when the arm 42 and pawl 41 return to initial position. Suitable stops 47 and 48 may be provided to limit the movement of the arm 42, and the stud 49 may sustain the pawl 41 from dropping too far to the left when the arm 42 is lowered.

The tip ends of the filling carriers, as indicated in Fig. 3, are supported by a rib 50 formed preferably as a part of the hopper, but when the filling carriers are moved by the transferer, the arm 42, at such time dropping downward, opens the tip throat, substantially as indicated in said prior application, and then the end or tip of the filling carrier is guided into the shuttle by the edge surface of the arm 42, as indicated in Fig. 3, and the coacting surface of the tilting arm 51, pivoted at 52 and normally sustained in position indicated by means of a spring 53.

It is essential at all times that neither the lay nor the picker stick or other moving part catch upon any of the filling threads which extend from the hopper to the take-up or filling end controller, and as a further means to this end the present invention provides an arm 54, Figs. 1 and 2, which will sustain by its upper surface any sagging thread as it approaches the plane of laying movement.

After a filling carrier has been transferred, it is important that the filling end which extends between the take-up wheel and the shuttle before it is cut or broken at the selvage of the cloth be not caught by any part connected to the lay, such as bolt heads and other projections thereon. To this end the front wall of the shuttle box is provided at its upper portion with a guard 55, Fig. 6, extending longitudinally of the shuttle box and preferably overlying the bolt head or other projection 56 or other projecting part of the shuttle box. At its inner portion, that is at the portion nearest the fell of the cloth, the guard 55 has a rim 57 which further serves to protect the filling thread from being caught by a moving part connected to the lay.

As the lay moves back after filling replenishment and the shuttle is picked to the opposite side of the lay, the filling end extending from the shuttle, if not properly guarded, may catch upon the bunter 58, to guard which there is provided a guard piece 59, the

front edge portion of which extends downward, as indicated in Fig. 2, and effectively prevents the filling end from injurious contact with the bunter.

5 After the loom has operated one or more picks following filling replenishment, the filling end, still held between the take-up roll and roll 29, is severed or broken at the selvage, whereupon the severed end drops
10 downward, as indicated in Fig. 2. As the lay moves back and forth, this end portion of the filling end is liable to be caught in the shuttle box or to become entangled there with the shuttle or the picking devices and
15 to be carried into the shed. To guard against this, during the time that the deflector 39 is acting upon this filling end to retire it from between the wheels 28 and 29, there is secured to the lay a plate 60 having
20 an inclined portion 61 adapted to deflect the filling end toward the outer edge 62 of the plate and the shouldered portion 63, Fig. 6, the construction being such that after the filling end has been broken or severed at the
25 selvage, such broken or severed end portion will drop and ride over the incline 61 to the outer edge 62 of the plate 60, where it will gradually move outward as the deflector 39 retires the thread from between the wheels
30 28 and 29, as will be readily understood.

It will be apparent that many changes may be made in the details of the present invention without departing from the general character and spirit thereof, and it is to
5 be understood that the invention is not restricted to the particular means herein shown and described as one embodiment thereof, but that it is definitely set forth in its true scope by the claims.

40 What is claimed is:

1. In a loom, the combination of filling carrier supply means, a transferer to transfer filling carriers from said means, a take-up for taking up the slack in the filling ends,
45 and means acting upon a filling end disconnected from the carrier to cause its disengagement from the take-up.

2. In a loom, the combination of filling carrier supplying means, a transferer to
50 transfer filling carriers from said means, a take-up for taking up the slack in the filling ends, and means for engaging a filling end disconnected from the filling for a carrier and directing it from the action of the
55 take-up.

3. In a filling replenishing loom, the combination of filling carrier supplying means, a transferer for transferring filling carriers from said supplying means, means for holding
60 the end of the filling as the carrier is transferred, and a device acting upon the new filling end to cause its disengagement from said holding means.

4. In a filling replenishing loom, the combination of filling carrier supplying means

for holding a supply of filling carriers, a transferer for transferring filling carriers from said supplying means, a device for holding the end portion of a filling thread when the carrier is transferred, means acting
70 upon the new filling end to cause its disengagement from said device after said end is disconnected from the filling on the carrier, and a guide for the filling end.

5. In a filling replenishing loom, the combination of filling carrier supplying means for holding a supply of filling carriers, a transferer for removing a filling carrier from said supplying means, a take-up for taking up the slack occurring in the filling
80 ends, and means for causing the filling ends to pass to and be acted on by the take-up in spread relation.

6. In a filling replenishing loom, the combination of filling carrier supplying means
85 for holding a supply of filling carriers, a transferer for removing a filling carrier from said supplying means, a take-up for taking up the slack occurring in the filling ends, means for spreading the filling ends
90 that they may pass to the take-up in spread relation, and means acting upon a filling end disconnected from the filling carrier to cause said end to be disengaged from control of the take-up.

7. In a filling replenishing loom, the combination of a source of filling carrier supply, means for transferring a filling carrier from said supply to the loom, a take-up comprising two surfaces between which the filling
100 ends pass, means for moving one of said surfaces to take up slack in the filling, and means for directing a filling end from between said surfaces when said filling end is disconnected from its carrier.

8. In a filling replenishing loom, the combination of a source of filling carrier supply, means for transferring a filling carrier from said supply to the loom, a take-up comprising two surfaces between which the filling
110 ends pass, and means for directing the filling ends between and for action by said surfaces in spread relation.

9. In a filling replenishing loom, the combination of a source of filling carrier supply, means for transferring a filling carrier from said supply, a take-up for taking up slack occurring in the filling ends, and
115 means acting automatically on a severed filling end to remove said severed end from the loom.

10. In a filling replenishing loom, the combination of a source of filling carrier supply, means for transferring a filling carrier from said supply, a rotary take-up for taking up slack occurring in the filling ends extending from the carriers, and means acting on a severed filling end while it is in control of the take-up to remove it from the
120 loom.

11. In a filling replenishing loom, the combination of filling carrier supplying means, a transferer for transferring a filling carrier from said means, means for holding the filling end as the carrier is transferred, and a bunter guard projecting alongside the bunter to protect the filling leading from said holding means following a transfer.

12. In a filling replenishing loom, the combination of a hopper for containing filling carriers, a transferer for transferring a filling carrier from said hopper, means for holding the filling end as the carrier is transferred to insure filling being laid in the shed when the shuttle is picked, and means for subsequently freeing the filling end from said holding means.

13. In a filling replenishing loom, the combination of a source of filling carrier supply, means for transferring a filling carrier from said supply, means for holding the filling end as the carrier is transferred, and a bunter guard having a guarding portion above the bunter to protect the filling leading from the holding means following a transfer.

14. In a filling replenishing loom, the combination of a source of filling carrier supply, a transferer, a take-up for taking up slack in the filling ends extended from the carriers, and means on opposite sides of the take-up for spreading the filling ends.

15. In a filling replenishing loom, the combination of a source of filling carrier supply, a transferer, a take-up for taking up slack in the filling ends extended from the carriers, means on opposite sides of the take-up for spreading the filling ends, and a deflector for deflecting a severed filling end from control of the take-up.

16. In a filling replenishing loom, the combination of a source of filling carrier supply, a transferer for transferring a filling carrier from said supply, means for holding the filling end leading from the carrier as the carrier is transferred, and means acting automatically to disengage the filling end from the holding means and discharge it from the loom after it has been disconnected from the filling on the carrier.

17. In a filling replenishing loom, the combination of a filling carrier supplying means, a transferer for transferring a filling carrier from said means, means for holding the filling end as the carrier is transferred, and a guard plate extending in front and longitudinally of the shuttle box to engage the depending portion of the filling end after it has been disconnected from the filling on the carrier and while it hangs from said holding means to prevent the filling end from being caught by a moving part of the loom, said guard plate having an inclined portion at one end.

18. In a filling replenishing loom, the combination of a hopper for holding filling carriers, a take-up wheel for acting on the filling ends extended from the carriers, and means acting automatically to disengage a severed filling end from the take-up wheel and discharge it from the loom.

19. In a filling replenishing loom, the combination of a source of filling carrier supply, two wheels between which the filling ends extend from the carriers, means for turning one of said wheels to take up slack in the filling ends, and a deflector to engage a filling end disconnected from its carrier and cause it to pass from control of the said wheels.

20. In a filling replenishing loom, the combination of a hopper for containing filling carriers, a transferer, a take-up wheel for acting on the filling ends extending from the carriers in the hopper, a spreader for separating or spreading the filling ends as they pass to the take-up wheel, means for actuating the take-up wheel, and a deflector for acting upon a filling end disconnected from its carrier and disengaging it from said take-up wheel.

21. In a filling replenishing loom, the combination of a hopper for containing filling carriers, and a transferer, said hopper having a throat and the back wall of the hopper being movable relative to the front wall to open the throat for the passage of the carrier as it is being transferred.

22. In a filling replenishing loom, the combination of a hopper for containing filling carriers and having a front wall and a back wall, a transferer, and yielding means permitting movement of one of said walls relative to the other as the transferer transfers a filling carrier from the hopper.

23. In a filling replenishing loom, the combination of a hopper having a pivotally mounted back wall and a relatively fixed front wall, a spring normally maintaining said back wall in closed relation with the hopper, and a transferer.

24. In a filling replenishing loom, the combination of filling carrier supplying means, a transferer for transferring a filling carrier from said means, means for holding the filling end as the carrier is transferred, and a guard plate extending in front and longitudinally of the shuttle box to engage the depending portion of the filling end after it has been disconnected from the filling carrier and as it hangs from said holding means to prevent the severed filling from being thrown or carried into the shed.

25. In a filling replenishing loom, the combination of filling carrier supplying means, a transferer for transferring a filling carrier from said means, means for holding the filling end as the carrier is transferred, and a guard plate having a part

to deflect the severed portion of a filling end hanging from said holding means to the front of the shuttle box, said plate extending longitudinally of the shuttle box and acting to prevent the filling end being thrown or carried into the shed after it is disconnected from the filling on the carrier.

26. In a filling replenishing loom, the combination of filling carrier supplying means, a transferrer, holding means for the filling end, a shuttle box, and a guard plate extending longitudinally of and projecting forward from the top of the shuttle box at the outer portion thereof to engage a loose filling end hanging from said holding means.

27. In a filling replenishing loom, the combination of filling carrier supplying means, a transferrer, a shuttle box, a guard plate extending longitudinally of and projecting forward from the top of the shuttle box to prevent the unsevered filling from being broken, and a second guard plate extending longitudinally of the shuttle box to prevent the severed filling being thrown or carried into the shed.

28. In a filling replenishing loom, the combination of a hopper for containing filling carriers, a transferrer, a lay having a shuttle box, means for holding the ends of the filling threads extending from the carriers in the hopper, and means extending beneath the filling threads between the hopper and said holding means for sustaining any slack filling thread and preventing its being caught or broken by a moving part of the loom.

29. In a filling replenishing loom, the combination of filling carrier supplying means, a holding device for holding the end portions of the filling leading from the carriers in the supplying means, a shuttle box, a guard extending longitudinally of the shuttle box to engage a filling end hanging from said holding device after the end has been disconnected from the filling on the carrier, and means acting automatically to

remove the hanging filling end from the loom.

30. In a filling replenishing loom, the combination of filling carrier supplying means, a transferrer for transferring carriers from said means, means for holding the filling end that filling may be laid in the shed as the shuttle is picked, and means acting upon a filling end after it has been disconnected from the carrier to remove the filling end from the holding means and discharge it from the loom.

31. In a filling replenishing loom, the combination of filling carrier supplying means, a transferrer for transferring filling carriers from said means, a take-up for taking up the slack in the filling ends, and a device acting in connection therewith for causing a filling end to be removed from the loom after it has been disconnected from the filling on the carrier.

32. In a filling replenishing loom, the combination of filling carrier supplying means, a take-up for taking up slack in the filling ends leading from the supplying means, means for directing the filling ends to the take-up in spread relation, and means for acting on a filling end disconnected from its carrier to discharge it from the loom.

33. In a filling replenishing loom, the combination of a transferrer, a hopper provided with a discharge opening for the passage of filling carriers, and having one of the hopper walls movably supported above the discharge opening, and means for normally holding the hopper walls in relative position to form a receptacle for filling carriers and permitting relative movement of said walls as the transferrer moves a filling carrier from the hopper.

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

JONAS NORTHROP.

Witnesses:

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