Sept. 1, 1925. 1,552,388

A. E. STAFFORD

FILLING REPLENISHING LOOM

Filed Aug. 2, 1924 4 Sheets-Sheet 1

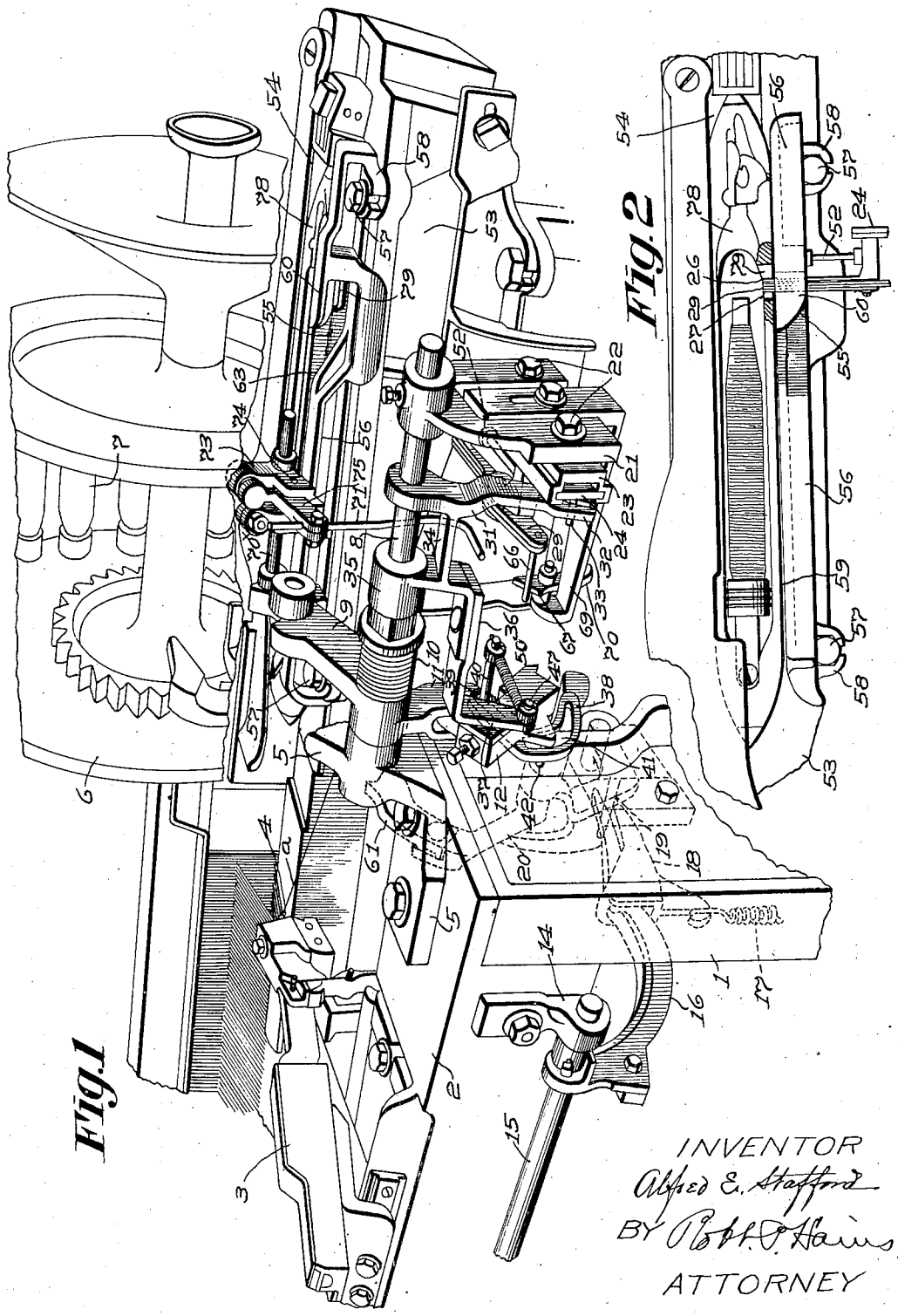


Fig. 1

Fig. 2

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FILLING REPLENISHING LOOM

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Fig. 3

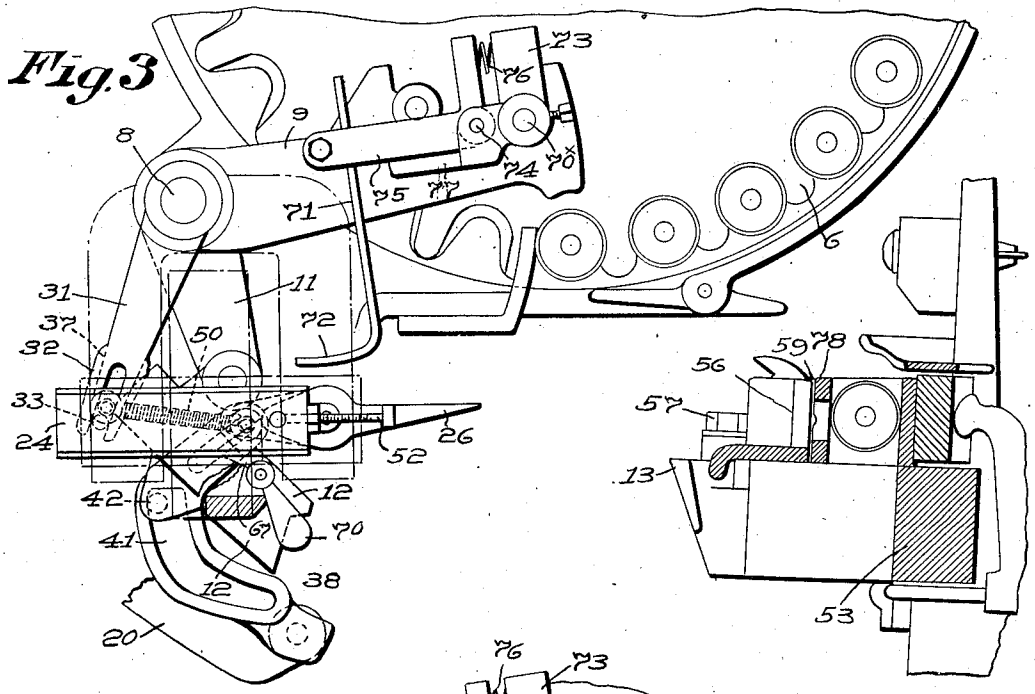
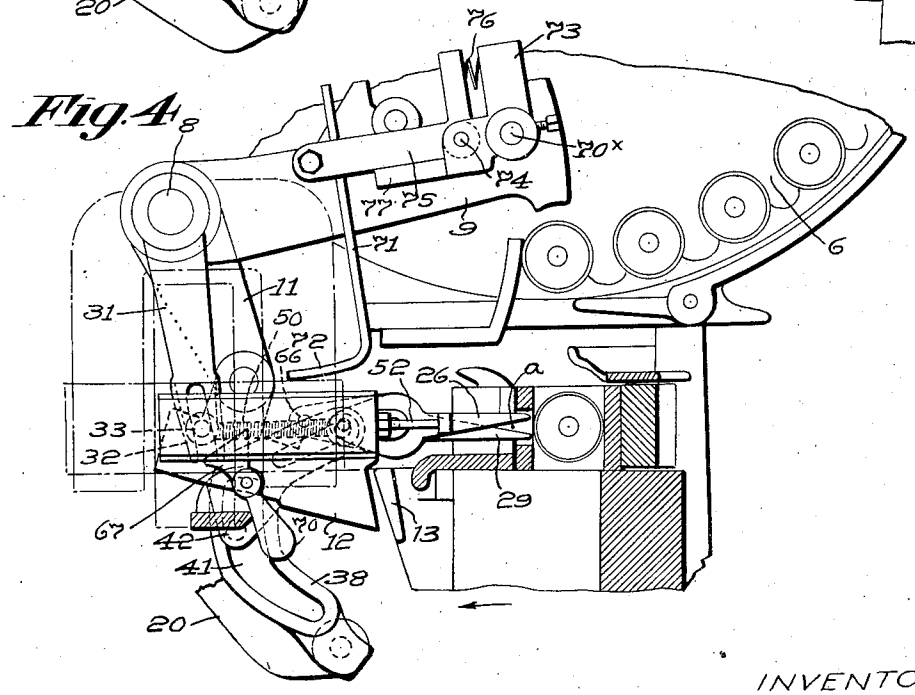


Fig. 4



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FILLING REPLENISHING LOOM

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Fig. 5

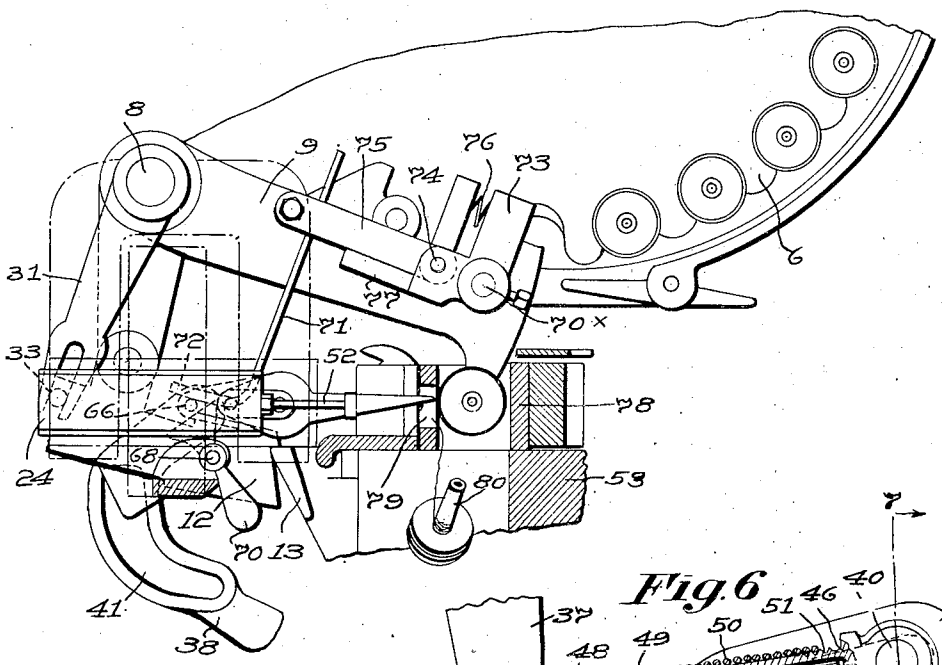


Fig. 6

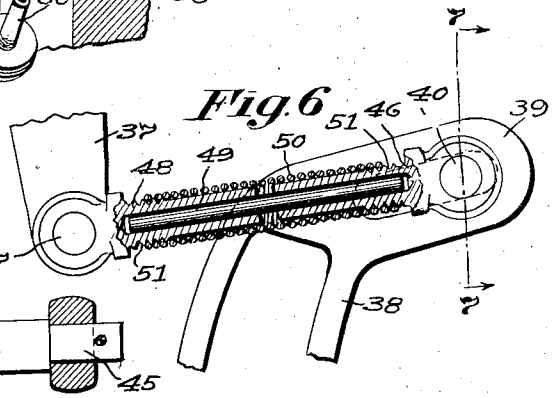


Fig. 7

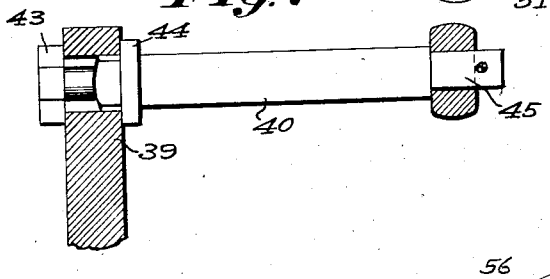
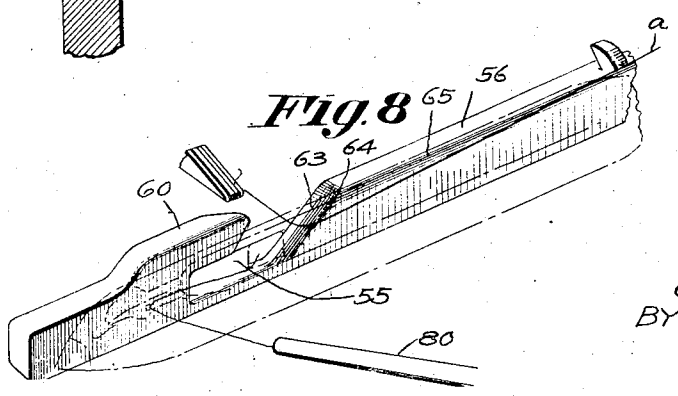


Fig. 8



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FILLING REPLENISHING LOOM

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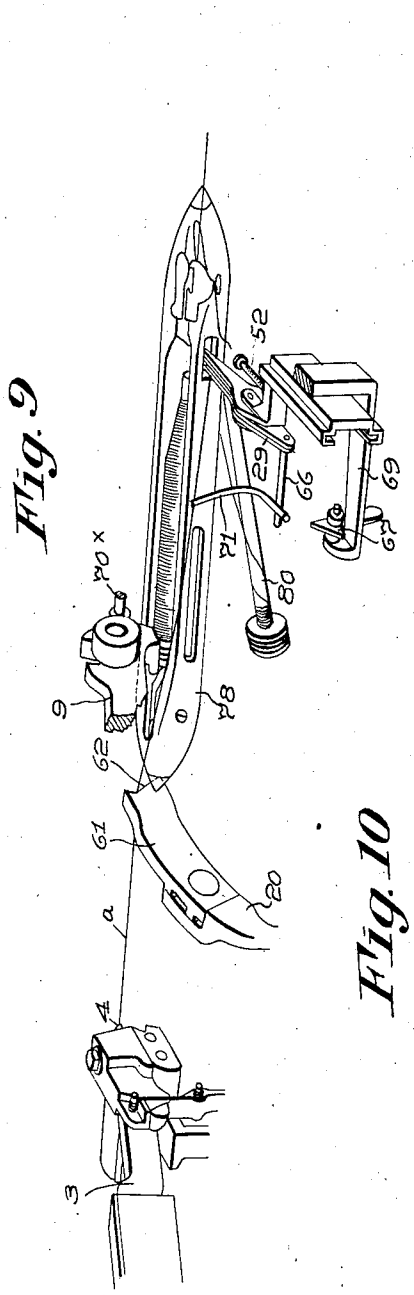


Fig. 9

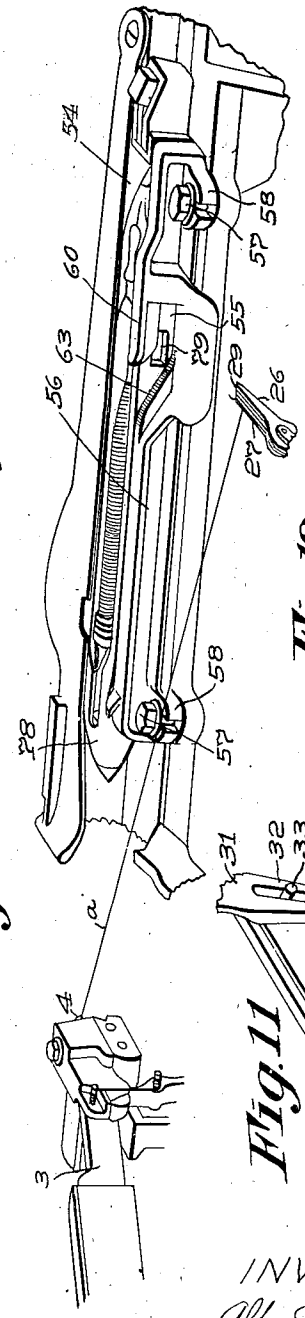


Fig. 10

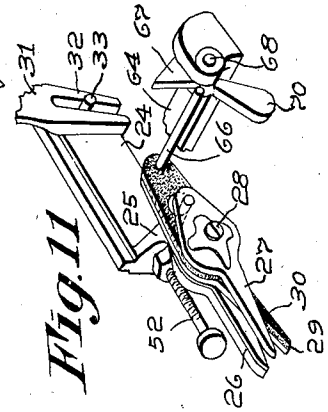


Fig. 11

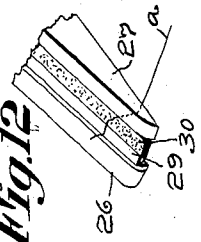


Fig. 12

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Patented Sept. 1, 1925. 1,552,388

UNITED STATES PATENT OFFICE.

ALFRED E. STAFFORD, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

FILLING-REPLENISHING LOOM.

Application filed August 2, 1924. Serial No. 729,670.

To all whom it may concern:

Be it known that I, ALFRED E. STAFFORD, 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.

This invention relates to filling replenishing looms wherein a fresh supply of filling is transferred to the shuttle when that previously in use has become substantially but not entirely exhausted.

When filling replenishment is effected, the spent filling end extending from the cloth selvage or fell to the shuttle eye and thence into the shuttle and to the filling carrier or bobbin to be ejected, must be removed, otherwise it is liable to be carried into the shed and form imperfect cloth. Much attention and great inventive skill have been devoted to the removal of this spent filling end, and various means have been suggested and employed for its removal from the danger zone. The patent to Alonzo E. Rhoades, No. 1,047,448, December 17, 1912, shows and describes a mechanism for this purpose wherein the spent filling end is parted at a point near the shuttle eye and the end leading to the cloth selvage is drawn frontwardly through a slot in the front wall of the shuttle box, and in this patent the usual shuttle feeler has another device for parting the filling near the inner end of the shuttle and carrying the end leading to the cloth selvage frontwardly into the range of action of the temple thread cutter. The patent to Draper and Northrop, No. 920,037, April 27, 1909, is another example of mechanism having for its purpose the removal of the spent filling end and the prevention of imperfect cloth production. In this patent the spent filling end is carried downwardly out of the shuttle box through a slot or opening extending longitudinally beneath the front wall of the shuttle box.

In accordance with the present invention, means are provided for engaging the spent filling between the ends of the shuttle when in replenishing position and removing the end of the filling leading to the cloth selvage over the top of the shuttle box. More specifically stated, the invention provides the front wall of the shuttle box with an opening leading from the top of the wall, and into which the means for removing the filling end leading to the cloth selvage extends when the spent filling end is to be removed, and withdraws the filling end from said opening and frontwardly towards the front of the loom over the top of the wall. This construction not only serves to effectively remove the spent filling end leading towards the cloth selvage, but obviates the necessity of materially weakening the front wall of the shuttle box so that it may act in conjunction with the rear wall or binder to contribute effectively in checking the shuttle when it enters the filling replenishing box.

An important feature of the present invention, therefore, consists in removing the spent filling end leading to the cloth selvage over the top of the front wall of the shuttle box.

Among the difficulties encountered in removing the spent filling end is the liability of the filling end leading to the cloth selvage to be clamped between the front wall of the shuttle box and the side of the shuttle when the latter is in replenishing position, and another important feature of the present invention therefore consists in means cooperating with the filling end removing means for permitting the free removal of the filling end over the top wall of the shuttle box.

A further important feature of the present invention consists in providing the opening leading from the top of the front wall of the shuttle box with an inwardly and upwardly inclined edge whereby, when the spent filling end removing means and lay are relatively moved in a direction of separation, the end of the filling leading towards the cloth selvage will be guided upwardly and over the front wall of the shuttle box.

The above and other novel features of the invention and new combination of parts will best be made clear from the following description and the accompanying drawings of one good practical form of the invention.

In the drawings:

Fig. 1 is a perspective view of the filling replenishing side of the loom having the present invention associated therewith;

Fig. 2 is a plan view of the shuttle box at the replenishing end of the lay, some of the parts being broken away, and showing more particularly the space afforded between the front wall and the side of the shuttle for the removal of the spent filling end over the top wall of the shuttle box;

Fig. 3 is an enlarged detail showing the normal position of parts during weaving;

Fig. 4 is a view similar to that of Fig. 3 showing the position of parts when filling replenishment is to be effected;

Fig. 5 is a view similar to that of Figs. 3 and 4 and showing the position of parts when filling replenishment has been effected or is about completed;

Fig. 6 is an enlarged detail showing the give-way device between the shuttle feeler and spent filling end parting and clamping means;

Fig. 7 is an enlarged sectional view on the line 7—7 of Fig. 6;

Fig. 8 is a detail perspective view, showing more particularly an inside view of the replenishing shuttle box, looking towards the front, and the spent filling end leading towards the cloth selvage as being moved over the top of the front wall of the shutle box;

Fig. 9 is a diagrammatic view showing more particularly the position of the spent filling end and the means acting thereon to free it between the front wall of the shuttle box and the side of the shuttle on replenishment of filling;

Fig. 10 is a view similar to that of Fig. 9 showing the filling end as having been removed over the top wall of the shuttle box and about the cloth selvage as a center after the replenishing operation;

Fig. 11 is a detail of the spent filling parter and clamp, showing the latter in its rearward position with the parter and clamp opened; and

Fig. 12 is a view of the parter and clamp, showing the end of the filling leading to the cloth selvage as held by the clamp.

In accordance with the present invention, when the spent filling end leading to the cloth selvage or fell of the cloth is removed over the top of the front wall of the shuttle box, it is swung around the cloth selvage as a center and held in such position by the clamp, as will more fully appear, for the action of the temple thread cutter.

The loom frame 1 is, or may be, of usual construction, and the breast beam 2 has mounted thereon the usual temple 3 provided with a temple thread cutter or selvage cutter for severing the ends of the filling along the cloth selvage. Mounted on the stand 5 which may be conveniently secured to the breast beam is the hopper 6 for holdign a series of filling carriers or bobbins 7 supplied with filling. The hopper 6 is shown of rotary type, but the invention is not restricted thereto, as any form of filling supplying hopper may be employed, the rotary type being shown merely for the convenience of illustration.

Extending from the hopper stand 5 is an arm or dead shaft 8 on which is mounted the transferrer 9 for transferring a fresh supply of filling to the shuttle, as usual. The transferrer 9 is normally under the influence of a spring 10 for maintaining it in inoperative position, and extending downwardly from the transferrer 9 is the arm 11 having pivotally connected thereto the dog 12, the end of which is adapted to be engaged by a bunter 13 on the lay, as usual, when filling replenishment is called. The transferrer 9, dog 12 and bunter 13 may be of usual construction now well-known in the art, and consequently need no further elucidation.

Mounted in the bearings 14, Fig. 1, one at each side of the loom, is the transverse or rock shaft 15, having secured thereto the rearwardly extending arm 16, as usual, which is normally under the influence of a spring 17, and connected to the arm 16 is the finger 18 which engages a pin 19 connected to the shuttle feeler 20, the construction being such that when replenishment of filling is called by rocking movement of the shaft 15, the shuttle feeler will be moved rearwardly into its position for determining whether or not the shuttle is properly boxed. The means for rocking the transverse or rock shaft 15 when the filling is to be changed has not been illustrated because such means is now well understood in the art and may comprise any usual form of feeler mechanism. The parts so far described, except for the particular construction of the shuttle feeler, may be as usual.

In accordance with the preferred form of the invention, the spent filling end is to be parted at a point between the ends of the shuttle when the latter is in the replenishing box and preferably at a point near the outer end of the shuttle or adjacent the side delivery eye thereof, and the end leading to the cloth selvage is to be engaged and held by a clamp which acts upon replenishment to move the filling end leading to the cloth selvage over the top of the front wall of the shuttle box.

Secured to and extending downwardly from the dead shaft 8 is a frame or bracket 21, Fig. 1, to which is secured by bolts or other securing means 22 the guideway 23 of a sliding carrier 24 to which the thread parter and clamp are connected. In the present instance of the invention, the thread parter and clamp are carried by a lug 25 ex-

tending from the carrier or slide 24, as indicated in Fig. 11. The thread parter and clamp comprises the relatively fixed members 26 and 27 between which is mounted on the pivotal support 28 the movable thread parter and clamp 29, the edge whereof towards the shuttle eye serves to part the spent filling and permit the end leading through the shuttle eye to the filling carrier or bobbin to be ejected to pass backward through the eye and out of the shuttle as the spent filling carrier or bobbin is ejected. The face portion of the thread parter and clamp towards the cloth selvage is preferably formed to clamp the end leading to the cloth selvage and the member 27 and to hold it until the thread parter and clamp are subsequently opened as will be clear.

In the present instance of the invention, the movable member 29 of the thread parter and clamp has a fibrous or fibroid surface 30 between which and the member 27 the end of the filling leading to the cloth selvage may be clamped and held, as indicated in Figs. 10, 11 and 12.

Loosely mounted on the dead shaft 8 is the carrier or slide operating member 31, the lower end portion of which is conveniently bifurcated as at 32 for the reception of a pin 33 extending from the slide 24, and the operating member 31 is connected to the shuttle feeler, so that as the shuttle feeler is moved rearwardly on call for replenishment of filling, the operating member 31 will be correspondingly moved to carry the thread parter and clamp into its rearward operating position to part and clamp the spent filling.

In the present instance of the invention, the operating member 31 is connected by a bridge or lug 34 to a collar 35 loosely mounted on the dead shaft 8, and the collar 35 carries an arm 36 having a downwardly extending end portion 37 conveniently formed for connection with the shuttle feeler.

In the present instance of the invention, the shuttle feeler 20 has a finger 38 secured thereto, and extending from the end portion 39 is a pin 40 by which the upwardly extending arm 37 is connected yieldingly in one direction to the shuttle feeler.

The finger 38 is slotted at 41 to receive the pin 42 extending from the dog 12, whereby when the shuttle feeler is moved in response to the call for filling replenishment, as hereinbefore described, the dog 12 will be raised into the path of the bunter 13 to cause operation of the transferrer to supply a fresh filling carrier to the shuttle and eject the spent filling carrier as the lay beats up.

The yielding connection between the upper end 39 of the finger 38 and the downwardly extending arm 37 connected to the operating member 31 is best illustrated in Figs. 6 and 7. As shown in Figs. 6 and 7, the pin 40 is secured to the upper end portion 39 of the finger 38 by means of a bolt 43 and collar 44 and its outwardly extending end portion at 45 carries a socketed member 46. Extending from the arm 37 is a pin 47 to which is connected a similarly socketed arm 48, and extending into the sockets of the two socketed arms is a pin 49. Surrounding the socketed members 46 and 48 is a spring 50 whose tension may be regulated by means of the screw threads 51 upon the socketed arms 46 and 48, the normal tendency of the spring 50 being one of contraction to hold the parts substantially in the position indicated in Fig. 6, but yielding to permit separating movement of the arm 37 and the upper end 39 of the finger 38. This give-way device is desirable because, as will later appear, the thread parter and clamp may be moved frontwardly by the lay before the shuttle feeler itself moves to its frontward inoperative position.

The spent filling end parter and clamp is under the control of means to properly position the parter and clamp when it is moved rearwardly to part and clamp the spent filling. In the present instance of the invention, as indicated in Fig. 11, the carrier or slide 24 has adjustably mounted thereon the bunter or stop 52 which is adapted to engage a surface on the lay when the parter and clamp is in rearward operating position in order to properly position the parter and clamp for the discharge of its parting and clamping functions.

The lay 53, at the filling replenishing end thereof, is provided with a shuttle box 54 which, in the present instance of the invention, has the usual shuttle binder at the back wall of the shuttle box and the fixed front wall, which is secured to the lay at each end of the front wall.

The front wall of the shuttle box has an opening 55 extending downwardly from the top of the front wall and preferably near the outer end of the shuttle when the latter is in the replenishing box. The front wall 56 is secured to the race surface of the lay by bolts 57 which pass through openings in lugs 58 formed on or projecting from the front wall of the shuttle box, and the opening 55 hereinbefore described, is located between the securing points of the front wall and race surface of the lay, the construction being such that the front wall is not materially weakened and may act in conjunction with the back wall or binder to effectually bring the shuttle to rest when it finally reaches replenishing position in the shuttle box.

As will be clear from Fig. 2, the front wall 56 of the shuttle box is secured to the lay in an inclined position, that is, its inner end—that nearer the cloth selvage—extends

frontwardly so that when the shuttle 54 is finally in the replenishing position in the shuttle box there is a space 59 between the inner surface of the front wall of the shuttle box and the adjacent side of the shuttle, sufficient in extent to permit the spent filling between the thread parter and clamp and inner end of the shuttle to be moved upwardly from between the shuttle and the front wall of the shuttle box as the spent filling clamp removes the filling over the top wall of the shuttle box.

The front wall of the shuttle box may be conveniently formed as a casting, and as the binding effect upon the shuttle is most desired at the front end or breast portion of the shuttle when it is moved to its boxed position, the front wall of the shuttle box may have an extension 60 which will act upon the shuttle as it enters the box to effectively cooperate with the rear wall or binder to bring the shuttle to rest. There is no objection to this binding action of the front wall of the shuttle at this part of the shuttle, because shuttles are usually provided with a groove extending from the side delivery eye lengthwise of the shuttle, and since the thread parter and clamp acts upon the spent filling preferably at a point near the shuttle eye, the small trailing end leading from the shuttle eye to the filling carrier to be ejected will readily pass backward through the eye as the filling carrier or bobbin is removed downwardly from the shuttle.

The shuttle feeler 20 is provided with an end portion 61 the rear edge of which is formed to raise the spent filling *a*, Fig. 9, over the inner end of the shuttle 54 when the shuttle feeler moves to its rearward feeling position upon call for replenishment. In the present instance, the rear end portion of the shuttle feeler has a long incline 62 which, when the shuttle feeler moves rearwardly to detect the position of the shuttle, will lift the spent filling end *a*, Fig. 9, upwardly over the end of the shuttle and out of the space 59 between the front wall of the shuttle box and adjacent side of the shuttle. Thus the shuttle feeler cooperates with the spent filling end removing device to move the filling end upwardly that it may pass over the top of the front wall of the shuttle box as the filling end removing means and lay separate.

As hereinbefore described, the front wall 56 of the shuttle box has an upwardly extending opening 55 for the removal of the spent filling over the top wall of the shuttle box, and in order to facilitate such movement of the spent filling end by the removing means, the inner edge 63 of the opening 55 is inclined upwardly and inwardlly towards the cloth selvage, as indicated in Figs. 1 and 8. To further insure and facilitate the passage of the spent filling end *a* over the top wall of the shuttle box, the inner surface of the inclined edge 63 is rounded as at 64, Fig. 8, and preferably the edge 65 may be rounded to present a smooth easy surface over which the filling end *a* leading to the cloth selvage may travel as it moves upwardly over the front wall of the shuttle box, Fig. 8.

The thread parter and clamp opening and closing means is such that when the thread parter and clamp has parted and clamped the spent filling end adjacent the shuttle eye, the clamp will be moved frontwardly, remove the spent filling end leading to the cloth selvage over the top of the shuttle box and about the cloth selvage as a center and will continue to hold the spent filling end for the action of the temple thread cutter or other cutter adjacent the cloth selvage.

In the present instance, the movable member 29 of the thread parter and clamp, has its front end portion provided with a pin 66, Figs. 1, 9 and 11, which engages a trip 67 as the thread parter and clamp is moved from its front to its rear operative position, to thereby open the thread parter and clamp. In the present instance of the invention, the trip 67 is pivotally supported at 68 on an arm 69 and has a weighted end 70 normally tending to hold the trip in the position indicated in Fig. 11. When the thread parter and clamp is moved rearwardly to perform its spent filling end parting and clamping function, it will thus be open and enter the shuttle box through an opening in the front wall thereof and engage between them the spent filling end leading from the shuttle eye to the cloth selvage. When the filling is being replenished by the transferrer and as the transferrer ejects the old filling carrier from the shuttle, the present invention contemplates means for closing the thread parter and clamp, and such means as shown is actuated by the transferrer.

Extending outwardly from the end of the transferrer is a pin or stud 70^{x} on which is mounted a downwardly extending arm 71, so positioned that when the transferrer 9 is moved downwardly to effect a transfer, the lower end portion 72 of the arm 71 will engage the pin 66 extending from the movable member of the parter and clamp and close the parter and clamp to part and clamp the old filling end.

In the present instance of the invention, the pin 70^{x} has adjustably secured thereto a supporting member 73, Figs. 1 and 5, to which is pivotally connected at 74 the lever 75 which is normally under the influence of a spring 76, holding the arm 75 of the lever on the stop 77, and to the end of the arm 75 of the lever is clamped the downwardly extending arm 71 or thread parter and clamp closing device. The spring 76 while nor-

ıally holding the lever 75 in the position indicated in Fig. 5, will yield, nevertheless, should occasion require, and prevent improper action of the thread parter and clamp.

In order that the thread parter and clamp may surely engage the spent filling end between the members thereof, the shuttle 78 is provided with an opening 79 in its front wall, so that when the thread parter and clamp is moved rearwardly to full operative position, the ends thereof may enter the opening 79 in the shuttle wall and engage the spent filling end between them, as indicated in Fig. 4.

In accordance with the present invention, when call for replenishment of filling is indicated, the rock shaft 15 will be turned or rocked to thereby move the shuttle feeler 20 into its rearward shuttle feeling position, and through the connections described, such movement of the shuttle feeler will cause the thread parter and clamp to move rearwardly into operative position, such rearward movement being accompanied by the opening of the thread parter and clamp to release any spent filling end that may be engaged thereby and to receive between them the filling end extending from the shuttle to the cloth selvage. As the thread parter and clamp moves to rearward operative position, it enters the opening 55 in the front wall of the shuttle box and the opening 79 in the shuttle, the spent filling end at such time being in position between the members of the thread parter and clamp, as indicated in Fig. 4. When the transferrer is operated to effect the transfer of the filling, the members of the thread parter and clamp will be actuated to part the spent filling end near the shuttle eye, to permit the end leading from the spent filling carrier 80, Fig. 5, to pass backwardly through the shuttle eye with the spent filling carrier and to clamp the end leading to the cloth selvage, Figs. 5 and 9. At this time, or just previous thereto, the shuttle feeler 20 will have lifted the end of the spent filling *a* over the inner end of the shuttle, as indicated in Fig. 9. As filling replenishment is effected, the thread parter and clamp, now in position to part and clamp the old filling end, will be actuated, and the parts move from the position of Fig. 4 to that of Fig. 5. Filling replenishment having now been effected, the shuttle feeler and thread parter and clamp will return to their frontward position and the latter will withdraw the spent filling end *a* out through the opening 55 and over the top wall of the shuttle box about the cloth selvage as a center, as indicated in Fig. 10. The spent filling end which has thus been drawn over the top of the front wall of the shuttle box will be held by the thread clamp when in frontward position, and position the filling end leading to the cloth selvage for the action of the cutter adjacent the selvage. As the thread parter and clamp moves to its frontward position, the pin 66 will move the trip 67, without, however, opening the thread parter and clamp.

When the thread parter and clamp is moved to rearward operative position, it will be accurately placed in position by means of the bunter 52 which will engage a part carried by the lay, as, for instance, the front wall of the shuttle box, and any further frontward movement of the lay will cause the thread parter and clamp to be moved frontwardly, a movement which is permitted by the give-way device between the shuttle feeler and the thread parter and clamp, as hereinbefore described.

What is claimed is:

1. In a filling replenishing loom, the combination of the lay, a shuttle box at the filling replenishing end thereof, and means for engaging the spent filling leading from the filling carrier to be ejected at a point between the ends of the shuttle and withdrawing it over the top of the shuttle box.

2. In a filling replenishing loom, the combination of the lay, a shuttle box at the filling replenishing end thereof, a clamp for engaging the filling between the ends of the shuttle when in replenishing position and withdrawing it over the top of the shuttle box about the cloth selvage as a center.

3. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay, means for parting the spent filling between the ends of the shuttle when in replenishing position, and means for holding the parted end leading to the cloth selvage and withdrawing it over the top of the shuttle box.

4. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall and an upwardly extending opening between the ends thereof, and means for engaging the spent filling end adjacent said opening and removing it over the top of the shuttle box.

5. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall provided with an opening, the edge of which is inclined upwardly towards the cloth selvage, and means for removing the spent filling end over the top of the front wall of the shuttle box.

6. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall provided with an upwardly extending opening, and a clamp for engaging the spent filling adjacent said opening and removing it from the shuttle box over the top of the front wall thereof.

7. In a filling replenishing loom, the com-

bination of the lay, a shuttle box at the replenishing end thereof having a front wall provided with an upwardly extending opening, and parting and clamping means for parting and clamping the spent filling adjacent said opening and removing the end leading to the cloth selvage over the front wall of the shuttle box.

8. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay having a front wall provided with an opening near the outer end thereof, and means for engaging the spent filling adjacent said opening and removing it from the shuttle box over the front wall thereof.

9. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall provided with an opening leading from the top of the wall, and means for parting and clamping the spent filling adjacent said opening and removing the end leading to the cloth selvage through said opening over the top of the front wall of the shuttle box.

10. In a filling replenishing loom, the combination of the lay, a shuttle box at the replensihing end thereof having a front wall inclined frontwardly of the lay towards the cloth selvage to provide a space between the front wall and shuttle when the latter is boxed, and means for engaging the spent filling between the ends of the shuttle and removing it from between the shuttle and front wall over the top of the shuttle box.

11. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall inclined frontwardly of the lay towards the cloth selvage to provide a space between the front wall and shuttle when the latter is boxed, and parting and clamping means for parting the spent filling between the ends of the shuttle and removing the end of the filling leading to the cloth selvage over the top of the shuttle box.

12. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall inclined frontwardly of the lay towards the cloth selvage to provide a space between the front wall and shuttle when the later is boxed and having an opening between the inner and outer ends thereof, and parting and clamping devices for parting the spent filling adjacent said opening and removing the end leading to the cloth selvage from said opening over the top of the shuttle box about the cloth selvage as a center.

13. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall inclined frontwardly of the lay towards the cloth selvage to provide a space between the front wall and shuttle when the latter is boxed and having an upwardly extending opening adjacent the outer end of the shuttle, and parting and clamping devices for parting the spent filling at a point adjacent the shuttle eye and removing the end leading to the cloth selvage upwardly through said opening over the top of the shuttle box.

14. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall inclined frontwardly of the lay towards the cloth selvage to provide a space between the front wall and shuttle when the latter is boxed, and having an upwardly extending opening adjacent the outer end of the shuttle, an edge of said opening being inclined upwardly towards the inner end of the shuttle box, and parting and clamping devices for parting the spent filling at a point adjacent the shuttle eye and removing the end leading to the cloth selvage upwardly through said opening over the top of the shuttle box.

15. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a wall provided with an opening, parting and clamping devices constructed and arranged to enter said opening to part the spent filling and remove the end leading to the cloth selvage, and means for guiding the end of filling out of the opening over the top of the shuttle box as it is removed by the clamping device.

16. In a loom provided with automatic filling replenishing mechanism, the combination of a shuttle having its side wall recessed at a point adjacent the delivery eye, a shuttle box having a wall provided with an opening extending downwardly from the top of the wall, and means operatively positioned on call for replenishment to engage the spent filling and withdraw it from said opening and over the top of the wall of the shuttle box.

17. A front wall for a shuttle box having a transverse opening therethrough extending out through the upper edge of the wall with the inner edge of said opening inclined upwardly towards the inner end thereof to permit the ready passage of the spent filling end over the top of the shuttle-box wall when swung out through said opening.

18. A front wall for a shuttle box having a notch extending downwardly from its upper edge to a point adjacent the delivery eye of a shuttle when in said box and having the inner edge of the notch inclined upwardly towards the inner end of the wall.

19. A front wall for a shuttle box having a notch extending downwardly from its upper edge to a point adjacent the delivery eye of a shuttle when in said box and having the inner edge of the notch inclined upwardly towards the inner end of the wall

and the rear surface of the inner edge rounded to permit the ready passage of the spent filling end when swung up through said notch and out from behind the wall.

20. An automatic filling replenishing loom comprising a lay, filling replenishing means, means for initiating the action of said filling replenishing means, a shuttle feeler movable under the control of said initiating means, a shuttle box having a front wall at the replenishing end of the lay, a carriage movable toward and from the shuttle box at a point intermediate its ends, filling clamping and parting means mounted on the carriage, means carried by the shuttle feeler for moving the carriage and therewith the filling clamping and parting means into operative position, and a positioning stop mounted on the carriage and contacting with the front wall of the shuttle box upon the movement of the carriage into operative position.

21. An automatic filling replenishing loom comprising a lay, filling replenishing means, means for initiating the action of said filling replenishing means, a shuttle box having a front wall at the replenishing end of the lay, a carriage movable toward and from the shuttle box at a point intermediate its ends, filling clamping and parting means mounted on the carriage, means actuated by or through the initiating means for moving the carriage and therewith the filling clamping and parting means into operative position, and a positioning stop mounted on the carriage and contacting with the front wall of the shuttle box upon the movement of the carriage into operative position whereby the filling clamping and parting means are accurately positioned with respect to the filling to be parted.

22. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay having a front wall provided with an opening extending out through the upper edge thereof, means rendered effective on call for replenishment of filling for lifting the spent filling end over the inner end of the shuttle, and means for engaging the spent filling end adjacent the opening in the front wall of the shuttle box for removing the spent filling end over the top of the shuttle box.

23. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay having a front wall provided with an opening extending out through the upper edge thereof, a shuttle feeler constructed and arranged to lift the spent filling end over the inner end of the shuttle on call for replenishment, and means for engaging the spent filling end adjacent said opening in the wall of the shuttle box for moving the spent filling end over the wall about the cloth selvage as a center.

24. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof, a shuttle feeler movable to operative position on call for replenishment of filling, a spent filling end parter and clamp for operating upon the spent filling at a point between the ends of the shuttle when in replenishing position and a give-way connection between the shuttle feeler and parter and clamp for moving the parter and clamp into operative position by movement of the shuttle feeler.

25. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof, a shuttle feeler movable to operative position on call for replenishment of filling, a spent filling end parter and clamp for operating upon the spent filling at a point between the ends of the shuttle when in replenishing position, a give-way connection between the shuttle feeler and parter and clamp for moving the parter and clamp into operative position by movement of the shuttle feeler and a stop connected to the parter and clamp for engaging a part on the lay to properly position the parter and clamp in operative position.

26. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay having a front wall provided with an opening between the ends thereof, a spent filling end engaging device for entering said opening, a transferrer, means operated by the transferrer for causing the spent filling end engaging device to engage and hold the spent filling, and means for causing said device to withdraw the spent filling end from said opening.

27. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay having a front wall provided with an opening between the ends thereof, a transferrer, a spent filling end parter and clamp mounted for movement towards and from the front of the loom, a finger movable with the transferrer to operate the parter and clamp, and means for moving the parter and clamp towards the front of the loom after they have been actuated by said finger to part and clamp the spent filling to withdraw the end of filling leading to the cloth selvage.

28. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay having a front wall provided with an opening extending downwardly from the top thereof, a thread parter and clamp, means for operating the parter and clamp to part the spent filling adjacent the shuttle eye and clamping the end leading to the cloth selvage and withdrawing the latter end from said opening over the top of the front wall of the shuttle box about the cloth selvage as a center that

it may be positioned for the operation of the selvage thread cutter.

29. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end of the lay, means for parting the spent filling, and means for clamping the spent filling between the ends of the shuttle and removing the end leading to the cloth selvage over the top of the shuttle box.

30. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof having a front wall constructed and arranged to provide a space between it and the shuttle when the latter is boxed for the removal of the spent filling end, and means for engaging the spent filling and withdrawing it over the top of the front wall of the shuttle box.

31. In a filling replenishing loom, the combination of the lay, a shuttle box at the replenishing end thereof, means for parting the spent filling, and means for withdrawing the spent filling from between the shuttle and wall of the shuttle box by moving it over the top of the front wall of the shuttle box.

In testimony whereof, I have signed my name to this specification.

ALFRED E. STAFFORD.