April 5, 1955 M. R. FLAMAND 2,705,508

FILLING CARRIER FOR SHUTTLELESS LOOMS

Filed Sept. 17, 1953

Fig. 1

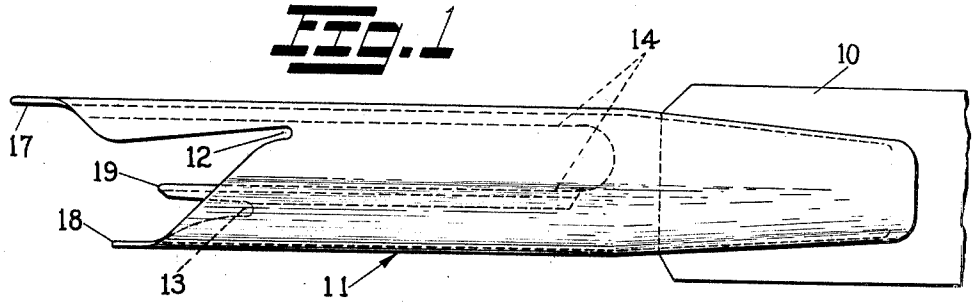


Fig. 2

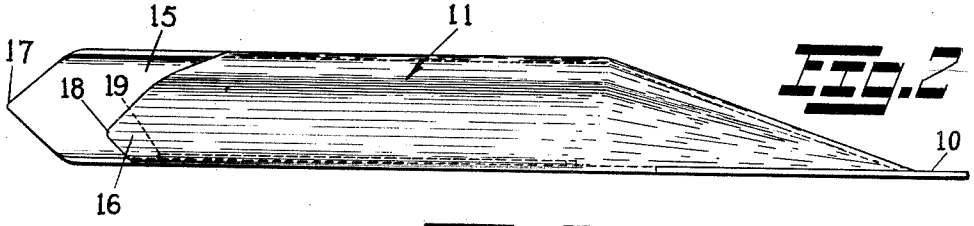


Fig. 3

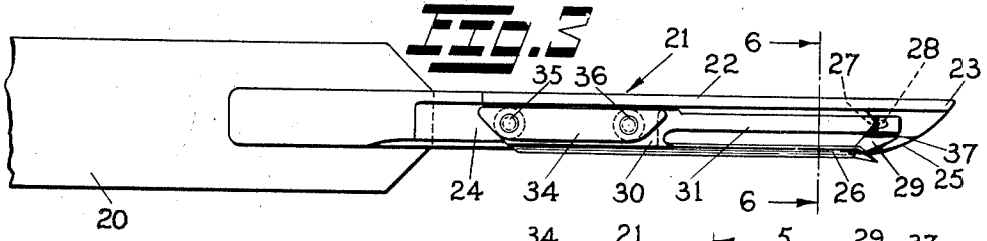


Fig. 4

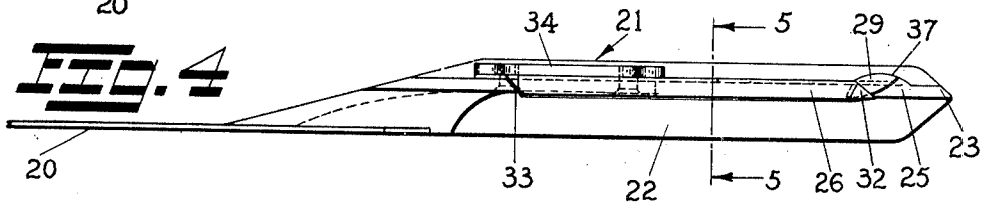


Fig. 5

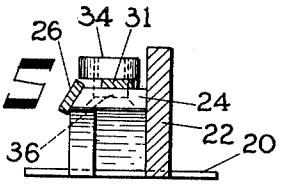


Fig. 7

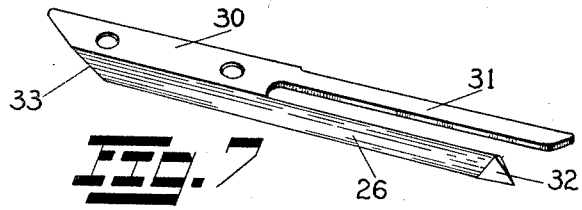
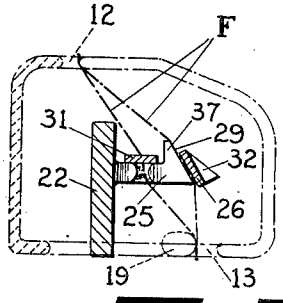


Fig. 6



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FILLING CARRIER FOR SHUTTLELESS LOOMS

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7 Claims. (Cl. 139—122)

This invention pertains to improvements in filling carriers for use in shuttleless looms, that is, looms of a type in which the filling is supplied from a source outside of the shuttle or filling inserting means itself.

It is a general object of the invention to improve the construction and operation of filling carriers of the type described and to make possible the employment of much smaller carriers thereby making practicable the functioning of the same within a shed of reduced size.

It is a further object of the invention to devise a carrier which shall be guarded against interference with the warp threads between which it passes and which shall have its thread engaging parts so disposed as to receive the filling at transfer under most favorable conditions and which shall effectively trap the filling and tension it as the same is drawn through the carrier.

Other objects will become apparent from the following disclosure.

In so-called shuttleless looms, that is, those looms in which filling is supplied from an outside source and is not carried to and fro through the shed by the shuttle or carrier itself, it is customary to insert each pick of filling by two reciprocating elements, one of which may hereinafter be referred to as an inserter or inserting member and the other of which receives or has transferred to it that loop of filling projected into the shed by the first member and which may hereinafter be referred to as a filling receiving or filling extending carrier. This latter member is normally provided with a hooked element by which the filling is seized and trapped and through which or past which the filling may move endwise so that the action of the carrier to which the said inserted loop is transferred is one of merely drawing through or extending an end which will have been severed to the precise length to complete the pick. It is customary to provide some sort of tensioning means functioning in cooperation with the hooked member on such filling extending carriers.

According to the invention a filling receiving and extending carrier is so devised as to effect its intended function including the receiving and trapping of the filling even though the cross-sectional dimensions of the carrier are substantially less than those of previously used carriers. This has been accomplished without affecting the certainty with which the device functions.

The inserting carrier presents a stretch of filling at an angle to the vertical which filing is trapped by the carrier second to act on that filling, and according to the invention, the latter carrier is devised to push or cam the filling thus presented aside, while maintaining rather than disturbing its general angular relationship as has been done heretofore. The parts are disposed at about the same angle as the filling and the trapping guard is relatively small and is shielded against unintended interference with the warp by a lug built up above or overlying the end of the trapping guard. The guard and tensioning member are preferably formed from a single piece of strip spring material and punched or cut to proper shape.

The invention will be described hereinafter in greater detail by reference to the accompanying figures of drawing in which:

Fig. 1 is a plan view showing the operating end of a filling inserting carrier for use with a shuttleless loom of the type described.

Fig. 2 is an elevation of that carrier shown in Fig. 1.

Fig. 3 is a plan view of the cooperating filling receiving and extending carrier which functions in conjunction with the inserter of Figs. 1 and 2 and to which the instant invention has been applied.

Fig. 4 is an elevation of the filling extending carrier of Fig. 3.

Fig. 5 is a section taken at line 5—5, Fig. 4.

Fig. 6 is a section taken at line 6—6, Fig. 3.

Fig. 7 is a perspective view of the combined trapping guard and tensioning member.

Now referring to the figures of drawing, the carriers which may be formed as more or less functionally integral portions at the ends of reciprocating members such as the so-called needles or rapiers employed in some looms, or flexible elements such as have been used in others, are caused to function in a manner well known to those conversant with this art, and it is considered sufficient at this point merely to call attention to certain patents which are illustrative of the type of loom concerned. Accordingly, attention is drawn to patents, numbered 1,515,102; 1,883,354; 2,191,376 and 2,604,123.

Preferably flexible carriers or tapes **10** are used to reciprocate the thread carrying members themselves which are caused to enter the shed and to be withdrawn therefrom, passing inwardly to a point somewhere adjacent the center of the shed of the fabric at which the transferring function, i. e., a gripping of the loop by the filling extending carrier and releasing thereof from the inserter, is caused to take place. Fixed in any suitable fashion to the tape **10** is a somewhat boxlike structure generally indicated by numeral **11** and comprising a top, planar portion having a notch **12** which cooperates with an offset notch **13** in the lower portion of the boxlike structure. This lower portion is also cut away to an extent defined by the parallel sides **14**, this recess or cut out portion providing for entry of a cooperating part of the carrier of Figs. 3 and 4 as will later be described. The offset of the notches **12** and **13** from the true vertical is advisable since the thread is held at an incline corresponding thereto as it is picked up incidental to being inserted. Of course, it is to be understood that the filling thread is supported outside or at any convenient point at the end of the loom structure and a stretch thereof is caused to assume a proper position to be engaged by the inserter by filling handling means not necessary of description here.

The inserter has side members **15** and **16** that present points **17** and **18** which facilitate the entry and passage of the carrier through the open shed. The point **19** which completes one of the bounding sides of the notch **13** is caused to assume a somewhat elevated position as illustrated in Fig. 2 by bending the metal upwardly so as to avoid any possibility of this part of the inserter catching on the warp threads over which the lower surface of the carrier passes during its inserting movement.

Now referring to Figs. 3 and 4, a flexible tape **20** similar to the tape **10** carries at its free end a filling gripping and extending member generally indicated by numeral **21** and comprising a vertical side plate **22** which at its forward end terminates in a point **23** similar to one of the points **17** and **18**, and being disposed at substantially the same level. The plate **22** is supplemented by a web **24**, the two forming somewhat of a T-shaped section and being attached by brazing or in any other satisfactory manner to the tape **20**, the end of which is tapered to blend into the general dimensions of the filling gripping and withdrawing member itself.

The end **23** of the side plate **22** is preferably formed to provide an integral hook member **25** which cooperates with trapping guard **26** to permit the entry of the filling but to prevent its release except by being drawn endwise past the interior surface of the hook.

The hook presents a smooth convex exterior along which filling may slide easily and a similar interior surface which is disposed at a lesser angle, but yet at a sufficient angle to trap the filling and guide it toward a somewhat centrally positioned notch **27**. The latter is supplemented by recesses **28** at the upper and lower surfaces of the hook.

The hook is beveled at the face **29** as shown and this beveled surface cooperates with the free end of the trapping guard **26** which is likewise disposed at an angle to lie flatly against the said beveled face **29**.

As shown in Fig. 7, the trapping guard **26** projects as a finger from a wider part **30** of a plate of spring stock from which also extends the tension member **31**. The guard is pointed as at **32** and that end is outwardly bent to form with the exterior of hook **25** a convergent entry space for receiving the filling. The opposite end of the combined guard and tensioning means is beveled as at **33** to obviate any possibility of the warp threads catching on that part. It is to be noted that the horizontal web **24** is well below the top of vertical web **22** so that at the angle which warp threads make at the shed, there can be no contact between the threads and this plate **30**. While there may be contact of the warp with clamping plate **34** into which screws **35** and **36** are threaded, since these screws are passed up from below and when tightened hold the assembly in place, and the plate **34** is also beveled at each end, there can be no catching on a warp thread.

The hook **25** has been provided with a boss or lug **37** rounded at the top and projecting above the main part of the hook **25** at either side of the pointed, bent end **32** of the guard. This lug prevents warp threads from catching under that member.

Referring to Fig. 6, the carrier **21** is shown in section and in full lines while the carrier **11** is shown in dot-and-dash lines, the two being in transferring position. Filling F is held in notches **12** and **13** and is cammed to the side by hook **25** until it enters between guard **26** and the hook and becomes trapped. Upon reverse movement of the carriers the filling is extended across the remainder of the fabric width and at that time, is drawn through notch **27** being guided by recesses **28** and under the end of tension member **31**. Thus it may be seen that as the filling is received by carrier **21**, the angular relationship of parts which engage it corresponds substantially with the slope of the filling and thus the safety or certainty of transfer and the ease with which the filling is trapped are all at a maximum with very small cross-sectional dimensions for the carriers. Once trapped, the filling must assume a path which subjects it to the action of the tension means which imposes a uniform retarding effect upon it as it is extended.

No lint may gather to cause undesired action since tension member **31** especially the end thereof is separated from the back wall or vertical plate **22**. The action of the filling in passing hook **25** and in being drawn through notch **27** and beneath the end of tension member **31** effects a clearing action. No lint gathers at that critical point to prevent proper action of the tension member.

Thus it can be seen that the present, simple carriers embody features which make them well adapted to function with maximum effectiveness and yet, they are much smaller in cross-section than has heretofore been considered practicable. The inertia forces are cut down and there is less tendency for the rapidly reciprocating carriers and their flexible or other actuating means to deviate from an intended pathway.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. For a loom having reciprocable carriers by which filling from an outside source of supply is inserted within sheds formed by warp threads, a filling extending carrier for receiving a loop of filling from a companion carrier adapted to insert that loop part way through a warp shed, and for extending an end from said filling loop across the remainder of the shed, which comprises a hooked member and trapping guard, said hooked member having an external surface inclined at a substantial angle to the vertical and said trapping guard having an end portion in spring contact with said inclined surface and disposed at substantially the same angle as said surface.

2. In a loom adapted to insert filling from an outside source of supply within sheds formed by warp threads, the combination of reciprocable means including an inserting carrier and a filling extending carrier, said inserting carrier having filling receiving notches offset vertically so that a stretch of filling is retained therein at a substantial angle to the vertical, said extending carrier having a filling engaging hook and a trapping guard, said hook having its external surface adjacent the said guard beveled at substantially the same angle as that at which the filling is retained between the notches of the inserting carrier, and said guard having spring contact with said beveled surface of said hook and being disposed at substantially the same angle as said surface.

3. In a loom adapted to insert filling from an outside source of supply within sheds formed by warp threads, the combination of reciprocable means including an inserting carrier and a filling extending carrier, said inserting carrier having filling receiving notches offset vertically so that a stretch of filling is retained therein at a substantial angle to the vertical, said extending carrier having a filling engaging hook and a trapping guard, said hook having an external surface at its point against which the cooperating end of said guard is resiliently pressed, and a lug forming a part of said hook and overlying its point and the trapping guard end for preventing interference between said parts and warp threads.

4. In a loom adapted to insert filling from an outside source of supply within sheds formed by warp threads, the combination of reciprocable means including an inserting carrier and a filling extending carrier, said inserting carrier having filling receiving notches offset vertically so that a stretch of filling is retained therein at a substantial angle to the vertical, said extending carrier having a filling engaging hook and a cooperating trapping guard and tensioning member, said hook having an external surface adjacent the trapping guard inclined at substantially the same angle as the filling extending between said notches, and said trapping guard having its hook cooperating end, at least, inclined correspondingly.

5. In a loom adapted to insert filling from an outside source of supply within sheds formed by warp threads, the combination of reciprocable means including an inserting carrier and a filling extending carrier, said inserting carrier having filling receiving notches offset vertically so that a stretch of filling is retained therein at a substantial angle to the vertical, said extending carrier having a filling engaging hook and a cooperating trapping guard and tensioning member, said hook having an external surface adjacent the trapping guard inclined at substantially the same angle as the filling extending between said notches, and said trapping guard having its hook cooperating end, at least, inclined correspondingly, said hook further having an inner surface defining a filling confining notch, and said tensioning member having its end overlying said notch and a part of the hook and being in resiliently pressed contact with the latter.

6. In a loom adapted to insert filling from an outside source of supply within sheds formed by warp threads, the combination of reciprocable means including an inserting carrier and a filling extending carrier, said inserting carrier having filling receiving notches offset vertically so that a stretch of filling is retained therein at a substantial angle to the vertical, said extending carrier having a filling engaging hook and a cooperating trapping guard and tensioning member, said hook having an external surface inclined at substantially the same angle as the filling extending between said notches, said trapping guard having its hook cooperating end inclined correspondingly, the said guard and tensioning member forming a part of a unitary means and being in spaced parallel relationship with said tensioning member spaced from that part of said carrier which is adjacent and parallel thereto.

7. For a loom having reciprocable carriers by which filling from an outside source of supply is inserted within sheds formed by warp threads, a filling extending carrier for receiving a loop of filling from a companion carrier adapted to insert that loop part way through a warp shed, and for extending an end from said filling loop across the remainder of the shed, which comprises a hooked member and trapping guard, said hooked member having an external surface inclined at a substantial angle to the

vertical and said trapping guard having an end portion in spring contact with said inclined surface and disposed at substantially the same angle as said surface, and an upwardly projecting lug forming a part of said hooked member and positioned to extend above and to either side of that part of the hook and trapping guard at which contact between the two is effected.

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