

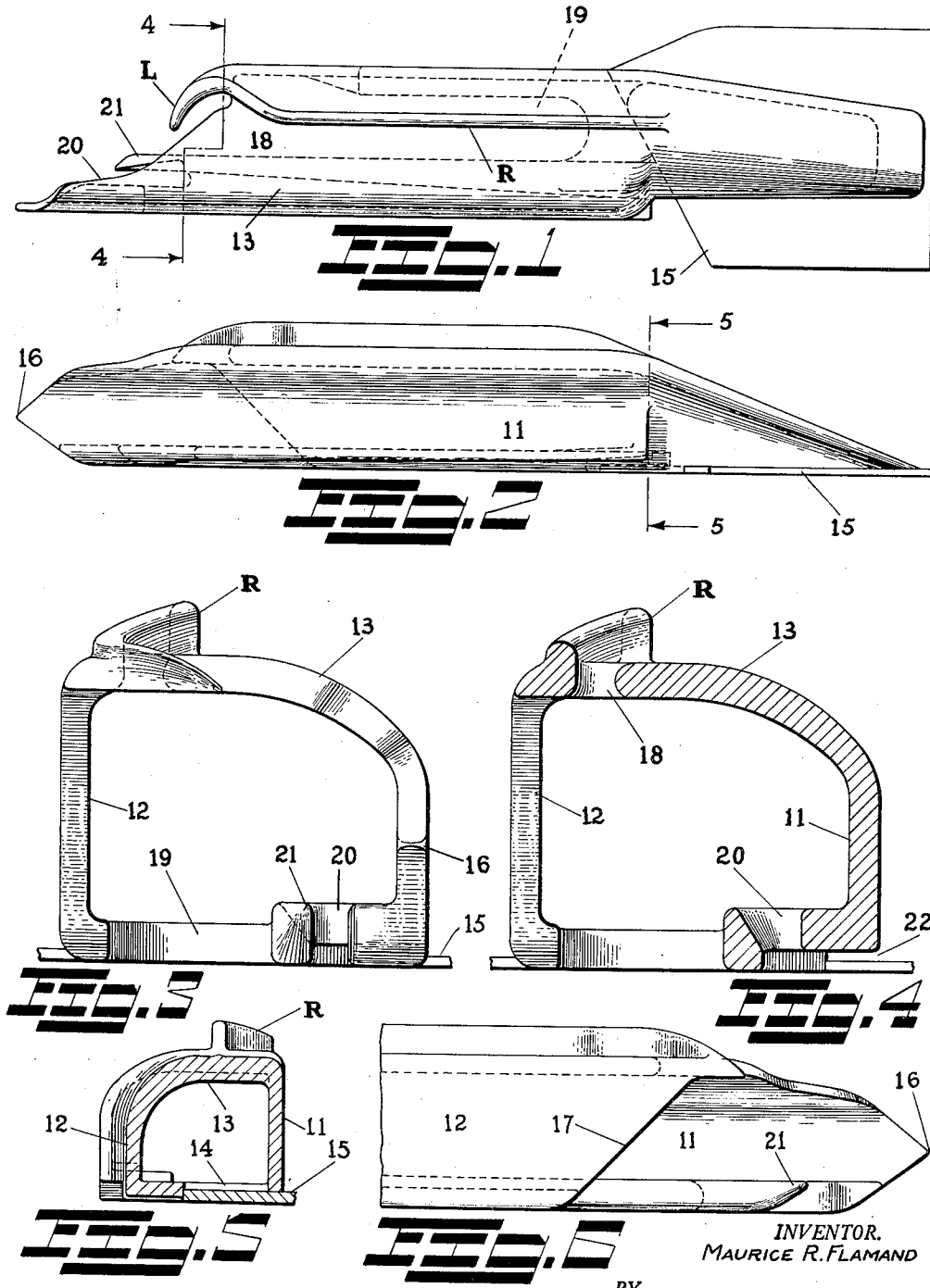
Dec. 26, 1961

M. R. FLAMAND  
FILLING INSERTING CARRIER

3,014,503

Filed March 28, 1960

2 Sheets-Sheet 1



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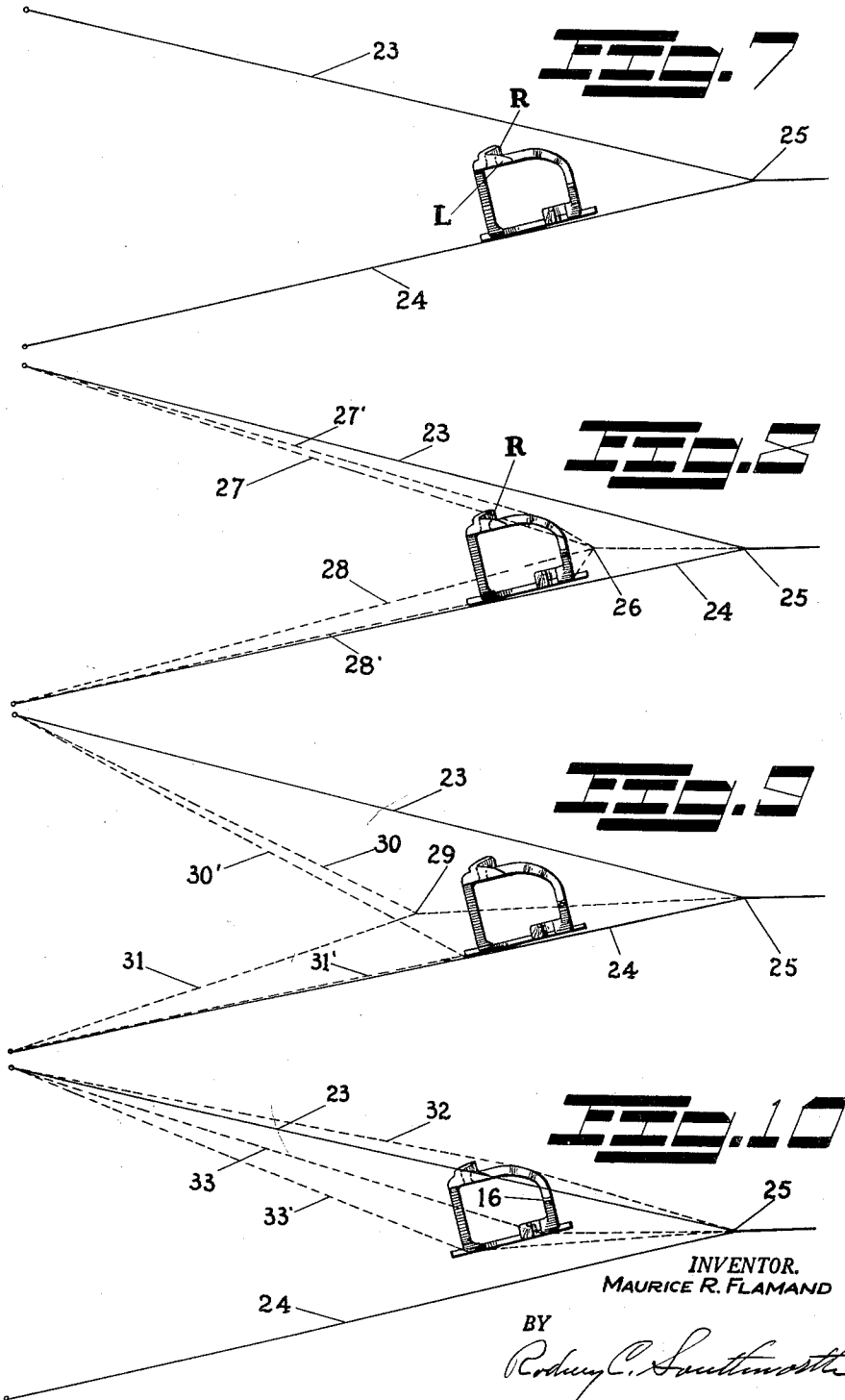
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**FILLING INSERTING CARRIER**

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Filed Mar. 28, 1960, Ser. No. 17,859

7 Claims. (Cl. 139-122)

This invention relates to looms for weaving and, in particular, to a filling inserting carrier for use in shuttleless looms wherein a filling yarn is introduced from a stationary package outside of the shed.

It is the general object of the invention to provide an inserting carrier for shuttleless looms which, should it inadvertently penetrate either layer of warp threads as a filling yarn is being introduced into the shed, would do so without damage to any of those threads, and further, which, in the event that it encounters two or more warp threads which have become entangled or stuck together at any point across the width of the shed so that they fail to assume their proper position with the main warp body, will act to deflect such threads without causing any breakage thereof so that the loom may continue in its operation.

It is a further object to provide a filling inserting carrier of such construction that upon penetration by the carrier of the threads forming the shed during insertion of a filling yarn, such threads are caused to be deflected either above or below the carrier without being caught between the sides thereof so as not to tear any of the threads.

It is a further object to provide a filling inserting carrier which is so constructed as to avoid any possibility of trapping the filling yarn being inserted between that carrier and either layer of warp threads forming the shed as the latter begins to close prior to withdrawal of the carrier therefrom, thereby avoiding undue tension upon or breakage of that filling yarn.

In shuttleless looms, that is, those looms in which filling is supplied from an outside stationary 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 members each of which is introduced into the shed from opposite sides thereof, one of which may hereinafter be referred to as an inserter or an inserting carrier and the other of which receives or has transferred to it that loop of filling projected into the shed by the inserter and which may be referred to as a filling receiving carrier. It is the former of these two carriers with which the present invention is concerned. The latter 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 each of the carriers functions to introduce the filling part way through the shed.

Where large numbers of these looms are in use, it becomes a daily occurrence for the inserting carrier inadvertently to penetrate one of the layers of warp threads due to a sudden increase in tension applied to the filling yarn as it is being introduced into the shed or for other reasons. Where similar carriers of the prior art are in use, there would result the breaking of a large number of warp threads, and sometimes serious damage to the carrier itself and damaging bending of the tape which controls reciprocation thereof. This means, of course, that much production time is lost not to mention expenses incurred in replacing or repairing damaged parts.

Additionally, in weaving certain types of goods where foreign substances or small clusters of yarn are often found in the warp, or due to sizing on the yarns, some of these warp threads may adhere together so that they extend across the shed in the path of the carrier rather

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than assuming their intended place in the upper or lower warp sheets. Here, again, where inserters of the prior art were in use, such threads became caught between the sides of the carrier as it traversed the shed and were broken, thereby stopping operation of the loom until they were repaired.

A further problem is frequently encountered when, as the inserting carrier is being withdrawn and as the shed begins to close, the filling being inserted becomes pinched between that carrier and either the upper or lower layer of warp threads forming the shed whereby the filling becomes unduly tensioned and even breaks at times to result in short picks being inserted or in a loom stop.

According to the present invention, the filling inserting carrier has been designed so that if either of the first-mentioned above two eventualities should occur, that is, if the carrier should penetrate the shed or if it should encounter entangled warp threads, these would merely be deflected above or below the carrier without any breakage of threads and resulting loom stops.

The carrier has been provided with a protective pocket which extends substantially along the entire length of both the upper and lower surfaces thereof, one for each of the two trailing ends of the filling being inserted and in which the filling is guided to make it impossible for either layer of warp threads at any time to pinch the filling against the inserting carrier.

Additional objects and advantages will be apparent from the following detailed description.

In the drawings,  
 FIG. 1 is a plan view of the filling inserting carrier;  
 FIG. 2 is a front elevational view thereof;  
 FIG. 3 is a side view as seen from the leading end of the carrier or from the left side of FIG. 2;  
 FIG. 4 is a sectional view taken on line 4-4 of FIG. 1 and looking in the direction of the arrows;  
 FIG. 5 is a sectional view taken on line 5-5 of FIG. 2 and looking in the direction of the arrows;  
 FIG. 6 is a side elevation of the leading end of the carrier as seen from the rear thereof;  
 FIG. 7 illustrates the normal position of the carrier with respect to the shed as viewed head-on;  
 FIG. 8 illustrates what takes place when the carrier encounters warp threads which are entangled on one side of the carrier;  
 FIG. 9 illustrates what takes place when the carrier encounters warp threads which have become entangled from a point on the opposite side of the carrier; and  
 FIG. 10 illustrates what takes place when the carrier penetrates the upper layer of warp threads in the shed.  
 In the drawings the filling inserting carrier is shown as being generally box-like in structure and comprises a front side wall 11 and rear side wall 12. These are interconnected by an upper portion 13 and lower portion 14. The leading end of the carrier is at the left in FIGS. 1 and 2 and its trailing end is shown as having a flexible tape 15 attached thereto and adapted to reciprocate the carrier to and fro along a portion of the warp shed in a known manner. The front side wall of the carrier has a V-shaped leading edge extending from a point 16 which is forwardmost on the carrier. The rear side wall has a leading edge 17 (FIG. 6) inclined from top to bottom toward the trailing end of the carrier. The top portion 13 has a generally S-shaped leading edge having a notch 18 extending therefrom at an angle with respect to the longitudinal axis of the carrier leaving a lip L extending forwardly of said notch. The bottom portion 14 has an elongated slot 19 offset slightly toward the rear side wall and extending from the leading end of the carrier along a major part of the length of that portion for the reception therinto of the filling receiving carrier (not shown) which may be of a construction similar to that shown in

United States Patent No. 2,705,508. A notch 20 is provided in the bottom portion adjacent the front side wall so that it is vertically offset from the notch 18 and extends inwardly a short distance in a direction parallel to the axis of the carrier, leaving a short stub 21 the forward end of the underside of which has been ground or filed to prevent any possible interference with warp threads thereby as the carrier is proceeding into the shed.

In order to prevent the possibility of a filling thread being inserted from being pinched along the lower forward edge of the carrier by warp threads with the result that the filling thread breaks or there is a variance in tension on the filling thread, a recess 22 is provided in the lower portion from a point just forwardly of the throat of the notch 20 along a substantial part of the length thereof. This recess forms a protective pocket for the filling thread to pass through.

Further, to avoid pinching by a closing shed of that part of the filling thread which trails along the upper surface of the carrier, a short rib R is provided which extends a short distance upwardly from the upper surface 13 and along substantially the entire length thereof and along the forward lip L as indicated particularly in FIG. 1. The intersection of forward surface of the rib with the upper surface of the carrier forms a second protective pocket in which the filling thread is guided. As the shed is closing and the carrier is being withdrawn, the upper layer of warp threads engages the upper edge of the rib making it impossible to pinch the filling. This rib also concentrates the forces exerted by that layer on the carrier on a line extending along substantially the midpoint of the upper surface 13, eliminating the tendency as with the prior art structures to tilt the carrier forwardly due to engagement of the upper layer of threads with the rounded forward portion of the upper surface of the carrier.

The operation of the inserting carrier will now be described with reference to FIGS. 7 to 10 wherein the the upper layer of warp threads is indicated by the line 23, the lower layer by the line 24, and the fell line by the intersection of these at the point 25. FIG. 7 illustrates normal operation of the carrier wherein the latter is travelling in a direction toward the viewer along the lower layer of warp threads and wherein all the warps threads are aligned in either the upper or lower layer.

FIG. 8 illustrates what takes place when a pair of warp threads on opposite sides of the shed have become entangled at a point 26 between the carrier and the fell of the cloth. The positions of this pair of threads prior to contact by the carrier is indicated by the dotted lines 27 and 28. As the carrier strikes these threads, due to the novel construction of its leading end, the upper thread 27 will be deflected upwardly to a new position 27' while the lower thread 28 will be deflected downwardly to a new position 28' to permit the carrier to pass through without causing any breakage.

FIG. 9 illustrates what takes place when the entanglement of warp yarns takes place at a point 29 which is located on the opposite side of the carrier. In this instance the entangled warp threads 30 and 31 are both deflected downwardly to pass completely underneath the carrier as indicated by the dotted lines positions 30' and

31'. If the point 29 were high enough, then the entangled threads would pass completely above the carrier instead of under.

In FIG. 10 there is shown what occurs when the carrier is inadvertently deflected upwardly to pass completely through the upper layer of warp threads. The point 16 on the front side wall will be first to contact that layer and will divide the layer into two groups 32 and 33, the former of which must necessarily pass upwardly over the top of the carrier. The lower group 33 will be pushed downwardly due to the incline of the leading edges of the two side walls finally to position 33' to pass completely underneath the carrier.

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 shuttleless loom, a filling inserting carrier which comprises front and rear side walls, notched upper and lower portions interconnected therewith, and a filling protecting pocket extending lengthwise substantially along the entire said upper portion.

2. The filling inserting carrier of claim 1 which includes a further lengthwise extending protective pocket formed between said front side wall and said lower portion.

3. The filling inserting carrier of claim 1 wherein said pocket is defined by said upper portion and a rib extending vertically therefrom.

4. For a shuttleless loom, a filling inserting carrier which comprises front and rear side walls, upper and lower portions interconnected therewith, said upper and lower portions each having a notch therein vertically offset from each other, said front side wall having a V-shaped leading edge, the leading edge of said rear side wall being inclined only toward the trailing end of the carrier, the leading edge of the top portion including a lip termination in an inwardly curved end, and further said V-shaped leading edge extending foremost of said carrier.

5. The filling inserting carrier of claim 4 which includes a recess forming a filling protecting pocket extending lengthwise along the major part of the bottom portion adjacent the front side wall.

6. The filling extending carrier of claim 4 which includes a filling protecting pocket extending lengthwise substantially along the entire said upper portion.

7. The filling extending carrier of claim 6 wherein said pocket is defined by said upper portion and a rib extending vertically therefrom.

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