United States Patent [19]

Volpe

[11] **3,842,867**

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[54] **WEFT INSERTING CARRIER**

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[52] **U.S. Cl.** ..... **139/122 N**

[51] **Int. Cl.** **D03d 47/22**

[58] **Field of Search** ..... 139/122 R, 122 N, 127 R

[56] **References Cited**

UNITED STATES PATENTS

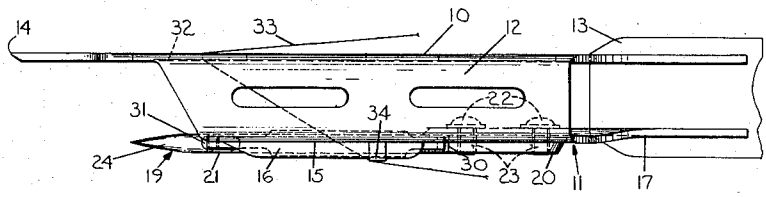
3,137,321	6/1964	Wasylewiez	139/122 N
3,638,686	2/1972	Sole et al.	139/122 N

Primary Examiner—Henry S. Jaudon

[57] **ABSTRACT**

A weft inserting carrier for a shuttleless loom in which weft yarn drawn from a stationary source is inserted as single picks into separate sheds formed by warp threads. The carrier is provided with a weft camming surface and a cooperating weft receiving and clamping device for positioning the weft for reception by a companion carrier adjacent the center of the shed.

2 Claims, 5 Drawing Figures



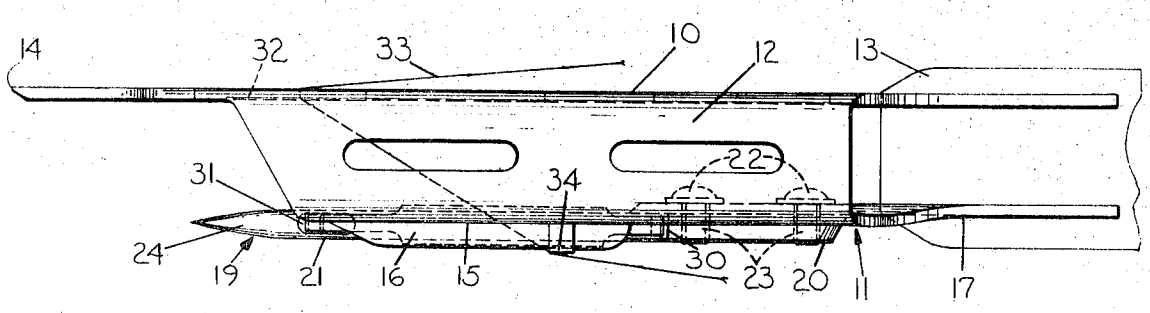


Fig. 1

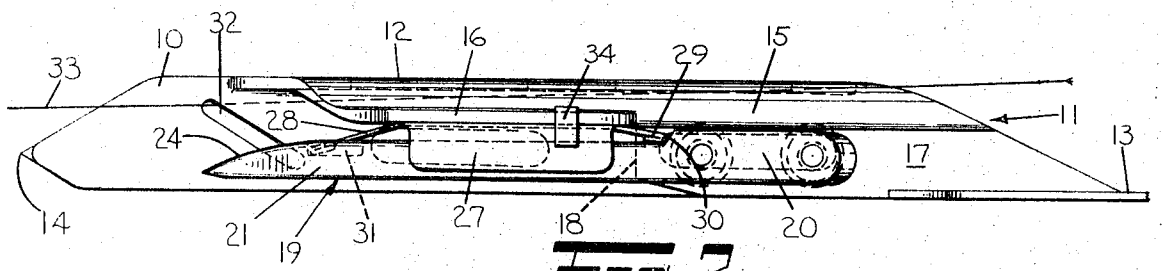


Fig. 2

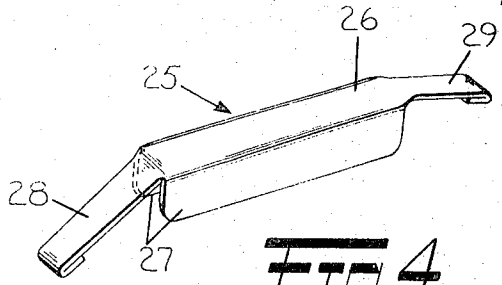


Fig. 4

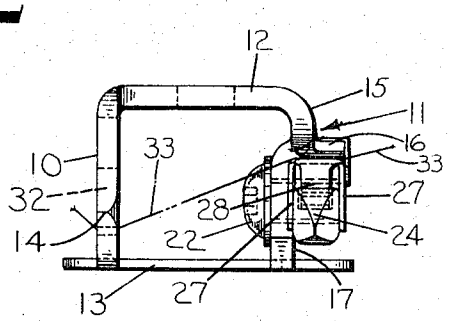


Fig. 3

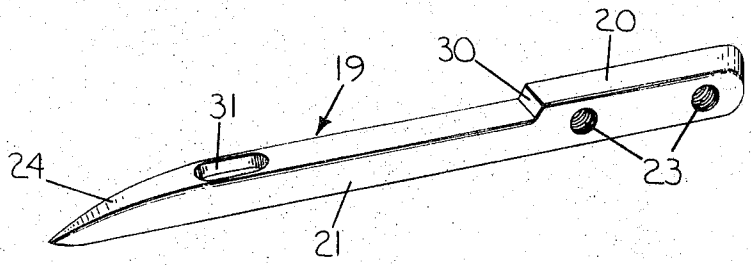


Fig. 5

WEFT INSERTING CARRIER

BACKGROUND OF THE INVENTION

In shuttleless looms which draw weft yarn from a stationary source outside of the loom it is common practice to insert each pick of weft by means of two reciprocating elements. That element which introduces the weft into the warp shed is known as the inserting carrier and that which receives or has transferred to it the introduced weft to be drawn through the remainder of the shed is known as the weft receiving or extending carrier.

The shuttleless loom to which the present invention is applicable is of the single pick insertion type and, as described in U.S. Pat. No. 3,431,951, the weft yarn extends through an eyelet in the rear wall of the inserting carrier and remains threaded therethrough during the performance of said carrier's intended function.

To insert single picks in this type of loom, the weft yarn must be clamped, held and then cut adjacent the shed each time the inserting carrier is withdrawn. In preparation for the next succeeding pick the weft yarn must be manipulated so as to be caught by a clamping element carried in the front wall of the inserting carrier. One form of mechanism for performing this function is shown and described in the United States patent referred to above.

Inserting carriers utilized for inserting single picks of weft have performed their intended function with a degree of success; however, certain adverse occurrences have presented themselves when attempts have been made to increase the operating speed of such looms.

The eyelet in the rear side wall of the carrier through which the weft remains threaded is disposed so that when the weft is presented to the clamping element located in the front side wall, the weft is caused to traverse the distance between the side walls, at a predetermined angle proper for its presentation and transfer to the extending carrier. The location of this eyelet, being disposed relatively close to the lower edge of the rear side wall, subjects the weft to considerable frictional drag as the carrier is withdrawn from the shed. This condition is due to the elevated position of the weft supply and the guiding elements through which it must pass prior to passing through the eyelet. such frictional drag on the weft has been responsible for weft yarn breakage and an increase in operating speed of the loom has substantially aggrevated this condition.

Relative to the clamping element carried by the front wall of the carrier, the tension by which it clamps the weft is very critical for too much tension will not permit the weft to be transferred to the extending carrier, thereby resulting in a loom stop due to lack of filling. With insufficient tension the element will fail to hold the weft during the carrier's insertion stroke resulting in a similar loom stop. the latter condition referred to has also been greatly aggrevated by increased operating speeds for with the sudden acceleration of the carrier the clamping element has been unable to repeatably maintain a clamping hold on the weft.

The weft inserting carrier according to the present invention has overcome the carrier problems referred to above by providing a weft guide in the rear wall of the carrier which permits the weft to move to a position where less frictional drag occurs on the weft as the carrier is being withdrawn from the shed. It also includes

a camming surface adapted to guide the weft downwardly during its presentation to the clamping element so that it will assume the required angle at which it must be presented to the extending carrier.

The weft receiving and clamping means includes a spring biased weft engaging member having increased contact surface for clamping the weft and a variable biasing force along said surface which at the weft's entrance end is relatively light and becomes progressively stronger along the longitudinal length of the surface. This feature permits the weft to be located in the receiving and clamping means in a position to assure adequate holding thereof during its insertion into the shed as well as its release to the extending carrier at time of transfer.

SUMMARY OF THE INVENTION

The weft inserting carrier comprising the invention is provided in the rear side wall thereof with a weft guide means in the form of an angularly disposed slot the sides of which serves as a weft camming surface. As the carrier is withdrawn from the shed the weft moves to the upper end of the guide where said weft is subjected to only a minimum amount of frictional drag. When the weft is presented to the clamping means carried in the front wall of the carrier, it is caused to move downwardly along the camming surface and assume a position which provides the required angle of the weft within the carrier for presentation to the extending carrier. The front wall of the carrier is provided with a guide finger for directing the weft into the clamping member which is in the form of a flat planar weft engaging surface yieldingly urged into contact with the lower side of a laterally extending lip that forms an integral part of said front wall.

The weft engaging surface of this clamping member is provided at each end thereof with integral extensions in the form of leaf spring members. The terminal portions of these spring members bear against the guide finger to urge the weft engaging surface into contact with the lip of the front wall.

The length of the spring member at the weft entrance end of the clamping member is substantially greater than that of the spring member at the opposite end. The difference in length of these spring members provides a relatively light biasing force at the weft entrance end of the clamping member and a greater biasing force at the opposite end. This form of biasing force permits the weft to enter the clamping member with a minimum of resistance and provides sufficient clamping properties intermediate the ends thereof for holding the weft during its insertion and its release to the extending carrier.

It is a general object of the invention to structurally improve the weft engaging portions of the inserting carrier herein described.

A further object of the invention is to devise an inserting carrier which will provide a minimum of frictional resistance to the weft yarn caused to pass therethrough.

These and other objects of the invention will become more fully apparent by reference to the appended claims and as the following detailed description proceeds in reference to the figures of drawing wherein:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of an inserting carrier showing the features of the invention applied thereto;

FIG. 2 is a side elevation of the carrier shown in FIG. 1;

FIG. 3 is an end view as seen looking from the leading end of the carrier or from the left side of FIG. 2;

FIG. 4 is a perspective view of the carrier's weft clamping member; and

FIG. 5 is a perspective view of the carrier's guide finger which supports the weft clamping member.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawing FIG. 3 shows the weft inserting carrier having a sectional configuration conforming generally to that of an inverted U which includes a rear side wall **10** and a front side wall identified generally by numeral **11.** These side walls are connected by a top planar surface **12.**

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 **13** attached thereto which is adapted to reciprocate the carrier to and fro along a portion of the warp shed in a known manner.

The rear side wall **10** of the carrier has a V-shaped leading edge extending from a point **14** which is forwardmost on said carrier. The front side wall **11** as shown in FIGS. **2** and **3** is provided with an upper surface **15** which extends forwardly from the trailing end of the carrier for a substantial portion of the latter's length and includes at its leading end a laterally extending lip **16.** Integral with and offset from the upper surface **15** of the front side wall is a downwardly directed web **17** which forms the lower portion of front wall **11.** Web **17** extends forwardly from the trailing end of the carrier for a distance approximately half the length of the upper surface **15** where it is directed upwardly as at **18** to join with the latter (FIG. **2**).

A weft guide member generally indicated by numeral **19** (FIG. **5**) having a supporting end **20** with an integrally formed finger **21** extending therefrom assembles to the web **17** by means of screws **22.** Screws **22** pass through holes in said web and are threadably received into aligned threaded holes **23** provided in the supporting end **20** of guide **19.** Finger **21** extends in a direction parallel with the rear wall **10** as well as beneath and in spaced relation to the lip **16** and terminates in a sloped weft engaging surface **24.**

A weft clamping member identified generally by numeral **25** in FIG. **4** having a top planar surface **26** with depending aprons **27** on each side thereof assembles on the upper surface of finger **21.** Surface **26** of the clamping member is continually urged into frictional contact with the underside of lip **16** by means of flat springs which form an integral part of and which extend from each end of said surface **26.** The spring at the forward end of surface **26** is identified by numeral **28** and that at the opposite end by numeral **29.** To provide the biasing force referred to above, the end of spring **29** is caused to bear against a step surface **30** (FIG. **5**) formed at the junction of the support end **20** and finger **21** of the weft guide member **19.** The end of spring **28** is seated in a recess or pocket **31** (FIG. **5**) provided in the upper surface of finger **21.** As shown in FIGS. **2** and **3** the depending aprons **27** extend downwardly along the side of the finger **21** and serve to stabilize the weft clamping member **25** in its assembled position.

As more clearly shown in FIG. **2,** the rear side wall **10** of the carrier includes a weft guide means formed as an angularly disposed elongated opening **32** through which weft yarn **33** from a fixed source outside of the loom is continually threaded. The sides of this elongated opening **32** serve as camming surfaces for the weft and are effective in guiding said weft to the uppermost end thereof during withdrawal of the carrier from the shed and to the lower or opposite end when the carrier is caused to move toward the shed to insert a pick of weft.

A weft locating stop **34** having a generally L-shaped configuration is fixed by any suitable means, such as by brazing to the lip **16** and serves to locate the weft when drawn between the clamping member **25** and said lip in a location which provides the desired clamping force on said weft. Additionally, this locating stop **34** serves to prevent the weft from being pulled completely through the clamping area in the event the weft yarn positioner of the type described in the aforementioned U.S. Pat. 3,431,951 fails to cut and release the weft during its insertion into a shed.

To summarize the operation the inserting carrier is caused to enter a shed and present a cut end of weft to an extending carrier which draws the weft through the remainder of the shed to complete a single pick.

To form single picks the weft yarn remains threaded through the angular disposed elongated opening **32.** As the carrier is being withdrawn from the shed the weft as shown in FIG. **2** moves to a second location at the upper end of opening **32** which permits it to pass through the carrier with a minimum of frictional resistance.

When the carrier is withdrawn from the shed the weft yarn positioner is caused to grip the weft and move it to a position toward the front of the loom and at the same time cut and hold that portion which extends through the carrier to its source of supply. As the carrier commences to move toward the shed to insert the next pick the weft extending from the weft yarn positioner is caused to move to a first location at the lowermost position within opening **32** and at the same time contact the sloped weft engaging surface **24** of the guide member **19.** Further movement of the carrier toward the shed causes the weft to be cammed to that position shown in FIG. **1** where it is held by the biasing force of the clamping member **25** against the underside of lip **16.** After the carrier has entered the shed and has traveled a predetermined distance the weft yarn positioner is timed to release the severed end of weft and is carried into the shed for completion of the pick by the extending carrier. FIG. **3** shows the angular position of the weft **33** within the inserting carrier which is necessary for presentation and transfer to the extending carrier. In this position the weft is located in a first location or the lowermost portion of opening **32** and traversing the distance within the carrier it is directed angularly upward to that position where it is gripped by the lip and clamping member **25.**

Although the present invention has been described in connection with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention as those skilled in the art will readily understand. Such modifications and variations are consid-

ered to be within the purview and scope of the invention and the appended claims.

I claim:

1. For a shuttleless loom of the type for inserting single picks of weft yarn into separate sheds formed by warp threads, a weft inserting carrier which comprises front and rear side walls with a top planar surface interconnected therewith, a weft guide means in said rear side wall through which the weft yarn passes, said weft guide means being effective to guide the weft between said first and second locations and a weft receiving and clamping means carried by said front wall for clamping the weft end when the weft is being inserted into the warp shed, said clamping means including a guide finger fixed to said front wall, a laterally extending lip forming a part of the latter, and a weft engaging member carried by said guide finger, biasing means formed integrally with said weft engaging member to urge said member into yieldable contact with said lip in a manner such that the weft is subjected to increasing pressure upon insertion between said member and said lip.

2. The weft inserting carrier according to claim 1 wherein said biasing means includes an integrally formed leaf spring member at each end of said weft engaging member with the length of one spring member being greater than the other to effect a greater biasing force at one end of said engaging member than at the opposite end.

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