

[54] LOOMS

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[51] Int. Cl.²..... **D03D 47/20**

[58] Field of Search..... 139/122 R, 122 N, 123,
139/127 R

[56]

References Cited

UNITED STATES PATENTS

3,159,186	12/1964	Juillard	139/122
3,390,707	7/1968	Scherillo	139/122
3,580,291	5/1971	Piccoli	139/122

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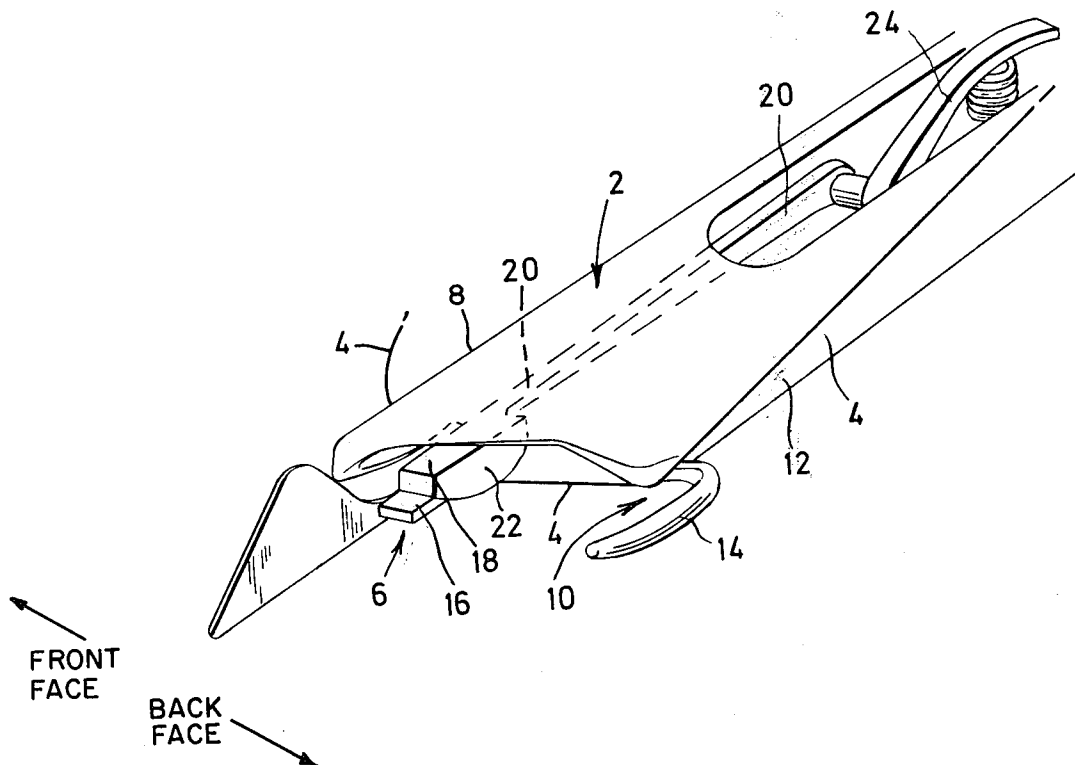
Attorney, Agent, or Firm—Pollock, Philpitt & Vande Sande

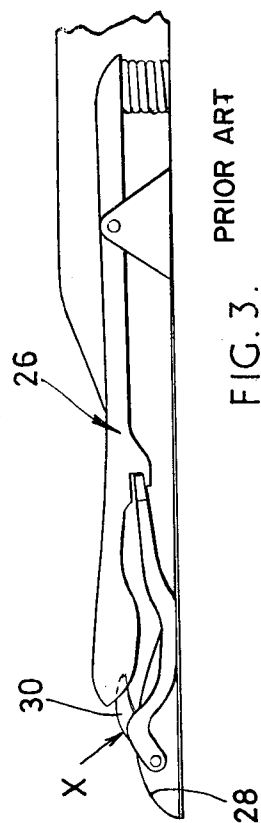
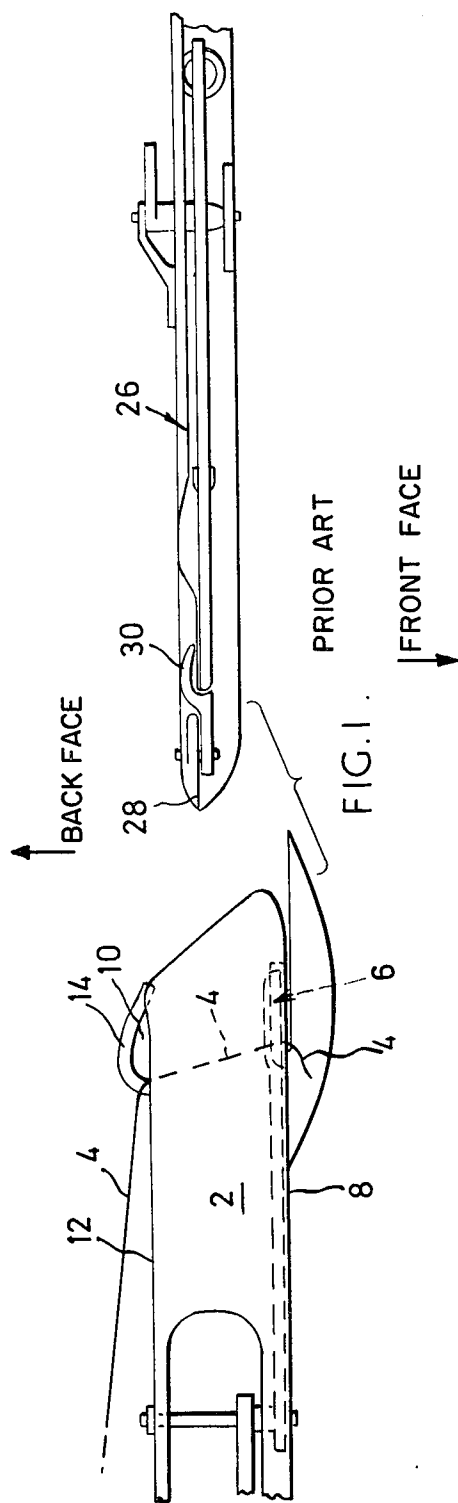
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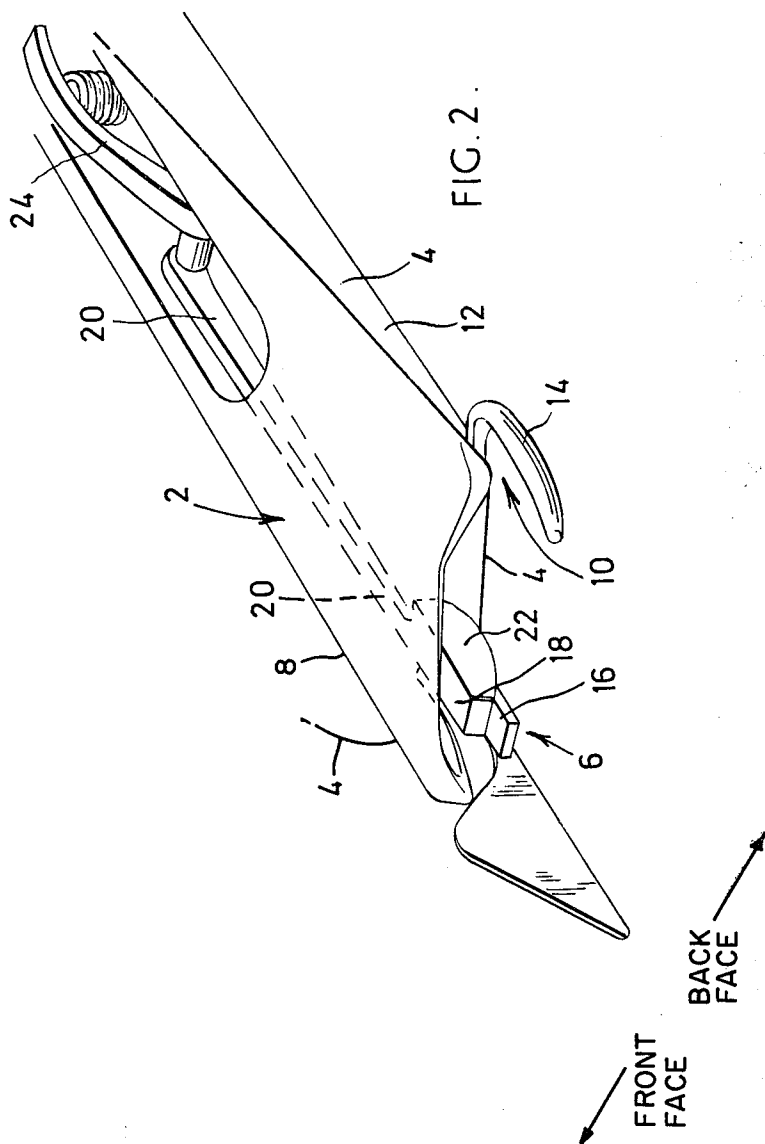
ABSTRACT

A weft yarn inserter for a shuttleless loom of the transfer type characterized in that means are provided on at least one side of the inserter to carry weft thread approximately on a level with, or lower than, a plane containing the bottom edges of the inserter.

6 Claims, 7 Drawing Figures







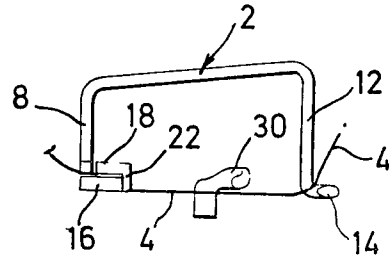


FIG. 4a

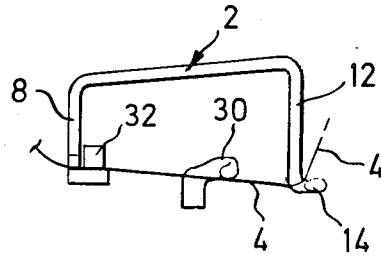


FIG. 4b

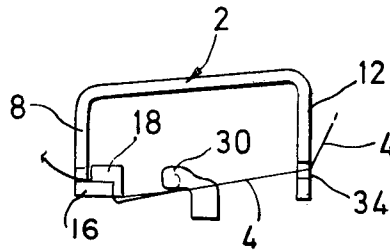


FIG. 4c

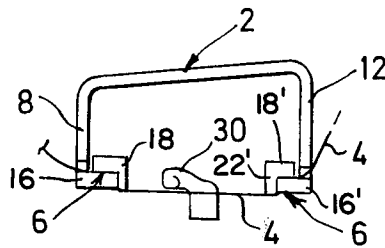


FIG. 4d

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LOOMS

This invention relates to shuttleless looms of the transfer type i.e. looms in which the weft thread or tape is carried through the warp shed by means of two spears or rapiers each being reciprocated into and out from the shed from opposite sides of the loom respectively one spear gripping the weft thread to carry the weft into the shed, the thread being then transferred at the centre of the shed to the other spear which is then driven outwardly to carry the thread through the remainder of the shed.

A particularly suitable weft inserter or spear (hereinafter referred to as an inserter of the type described) is described in the specification of our co-pending application Ser. No. 392,906 now U.S. Pat. No. 3,857,419. This comprises two levers one carrying a hook at its outer end and being pivotally mounted on the leading end of the inserter at a point adjacent the hook, the other lever being pivotally mounted between its ends and having its leading end movably connected to the trailing end of the first lever. A yarn clamp surface is preferably provided adjacent the hook so that yarn can be trapped between the hook and the clamp surface and the position of the pivot of the first hooked lever enables the yarn to be clamped tightly and positively. Pivotal movement of the second lever, the pivot point of which is preferably nearer the trailing end than the leading end, caused for example by a small downward movement of the trailing end, provides a positive and relatively large movement of the first lever to enable the hook to be moved to a position to catch the yarn and subsequently to a position to clamp the yarn.

Such an inserter may be modified in the manner described in our co-pending application Ser. No. 422,505 by providing the leading end of the said second lever of the inserter with a nose which extends beyond the point of connection of the two levers and which has surfaces located alongside and above the hook to act to deflect warp yarns from the hook on withdrawal of the inserter from a shed.

As the nose extension of the lever lies within the confines of the inserter it does not require the use of a bridge member to lift it above the tape supports, so the shed height can be reduced.

If the inserter described in Application Ser. No. 422,505 hereafter called the 'right' inserter pulls out from the shed, weft ends which it has received, at the centre of the loom from a second or 'left' inserter which carries the weft into the shed, then it is desirable that the 'left' inserter should present the weft ends to the 'right' inserter at a low level to enable proper transfer of the weft to take place.

This is achieved by the use of an inserter in accordance with this invention which is provided with means on at least one side of the inserter to carry weft thread approximately on a level with or lower than a plane containing the bottom edges of the inserter.

Such means may comprise, at one or both sides of the inserter, a clamp having a downwardly projecting lip over which clamped weft thread may pass and the lower surface of which is on a level with or lower than, the bottom edge of the inserter at the said side or sides. Alternatively a standard or lipped clamp may be provided at one side and at the other side, an arm projecting out from the inserter level with, or lower than, the bottom edge of that side of the inserter, to form a guide

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slot into which weft may be inserted during pick-up outside the shed.

With such a 'left' inserter, the weft may be held at a lower level than hitherto thus allowing the yarn to strike and ride over the nose of the right inserter before being deflected into its hook. This considerably aids in obtaining more positive transfer of the weft.

The 'left' inserter may have several forms. If the hook on the 'right' inserter extends to one side (the "back") then the left inserter may have a lipped clamp on its 'front' face and an arm guide at the "back" side. Alternatively, it may have a standard clamp at its front face and yarn sloping down to an arm guide at the back face.

If the hook on the 'right' inserter extends towards the front side, then the 'left' inserter may have a lipped clamp on the front face to hold the weft down at that side and either an arm guide at the back or be formed with a slot in the back face allowing the yarn to slope up slightly from the front to the back face.

It will be appreciated that the invention also extends to a shuttleless loom having an inserter in accordance with the invention.

The invention will now be further described by way of example, with reference to the accompanying sketch drawings, in which:-

FIG. 1 is a plan of an inserter in accordance with this invention and an inserter in accordance with the invention of application Ser. No. 422,505.

FIG. 2 is a perspective view of a 'left' inserter in accordance with the invention;

FIG. 3 is a side elevation of a corresponding 'right' inserter; and

FIG. 4 is a diagram illustrating various combinations of clamps and arm guide of a 'left' inserter in accordance with the invention.

FIG. 1 is a plan view showing a "left hand" inserter 2 in accordance with the teachings of this invention and a "right hand" inserter 26 in accordance with the disclosure of application Ser. No. 422,505. The arrows on FIG. 1 define, respectively, the front face and back face of the inserters. The inserter 2 is shown carrying a weft end 4 which it has picked up outside the shed. This inserter is of shallow inverted channel section with a front face 8 and back face 12. The inserter includes a clamp 6 holding the weft 4 at the front face 8 and a slot 10 provided between the bottom edge of the back face 12 and an outwardly projecting curved guide arm 14. FIG. 2 is a perspective view of the left hand inserter in accordance with the teachings of this invention and the arrows indicate respectively front face and back face.

The clamp 6 comprises a fixed clamp plate 16 and a movable clamp member 18 carried at the end of a pivoted lever 20 and provided with a downwardly extending lip 22 which fits snugly against the inner surface of the plate 16 and causes the weft to be held at the bottom edge of the front face of the inserter.

The movable clamp member 18 is lifted to open the clamp when an arm 24, connected to the lever 20 is depressed. The weft can then be carried through the remainder of the shed by the right hand inserter generally indicated at 26 (as described in the specification of application No. 422,505).

The weft is transferred when the two inserters meet and the right hand inserter 26 travels within the confines of the left with the weft thread engaging the rounded nose 28 of the right inserter and sliding over the nose to be caught by the hook 30 which is in its

upper 'open' position. The hook is then pivoted down to clamp the weft and as the two inserters move apart, the weft end is withdrawn from the clamp 6.

Due to the fact that the weft is carried by the left inserter at a low level it strikes the nose 28 of the right inserter rather than the hook at a higher position, e.g. that marked X in FIG. 3 which would occur with known 'left' weft inserters. As the yarn strikes the nose it is more positively guided as compared with merely striking the hook and better yarn engagement and weft transfer is achieved. Alternative arrangements of a weft inserter in accordance with the invention will now be described with reference to FIG. 4.

FIGS. 4A through 4D show end views of the "left hand" inserter illustrating the relationship between the clamp (and its components 16 and 18) and either the guide arm 14, the alternative slot 34 or additional clamps 6 with respect to the hook 30 of the "right hand" inserter when the weft is being transferred from the "left hand" inserter to the "right hand" inserter. The representation of the lever 20 and arm 24 are omitted for the sake of clarity.

FIG. 4(a) shows the left inserter of the form shown in FIGS. 1 and 2. FIG. 4(b) shows an arrangement in which the lipped clamp 6 is replaced with a standard clamp 32 which holds the weft at a higher level than the lipped clamp. However, if the hook 30 of the 'right' inserter faces towards the back face, the weft which slopes down towards the guide arm 14 is at a sufficiently low level opposite the hook for good transfer to take place.

In FIGS. 4(c) and 4(d) the hook 30 of the 'right' inserter 26 is shown extending towards the front face and in this case the guide arm 14 may either be replaced by a slot 34 in the back face of the inserter (FIG. 4c) or by a second lipped clamp 6 comprising fixed clamp plate 16' and moveable clamp member 18' with a downwardly extending lip 22' (FIG. 4d). Moveable member 18' may be carried at the end of a pivoted lever (not shown) similar to the pivoted lever 20 adjacent the front face of the inserter (see FIG. 2). This latter arrangement also being suitable if the hook faces towards the back face.

In each case a clamp is located at the front face of the

left inserter to ensure a positive gripping of the weft at that side during pick-up from the supply package outside the shed.

The general operation of the loom incorporating the inserters shown in FIG. 1 is described in more detail in the specification of co-pending application Ser. No. 392,906.

I claim:

1. A weft yarn inserter for a shuttleless loom of the transfer type, said inserter having a body of substantially channel shape including a pair of sides characterized in that means are provided on at least one of said sides of said body to carry weft thread approximately on a level with or lower than a plane containing the bottom edges of the inserter side at the thread carrying end whereby weft thread is carried between said sides transverse to the direction of intended movement of said inserter.

2. A weft yarn inserter as claimed in claim 1 in which said means to carry weft thread comprise a clamp having a downwardly projecting lip over which clamped weft thread may pass, the lower surface of said lip being on a level with or lower than the bottom edge of the inserter at said side.

3. A weft yarn inserter as claimed in claim 2 which includes a clamp having a downwardly projecting lip provided at both sides of said inserter.

4. A weft yarn inserter as claimed in claim 2 having said lip clamp at one side and, at the other side, an arm projecting out from said inserter level with or lower than the bottom edge of said other side to form a guide slot into which weft thread may be inserted.

5. A weft yarn inserter as claimed in claim 2 having a lip clamp only at one side of said inserter, the other side of said inserter being formed with a slot to receive weft yarn.

6. An inserter claimed in claim 2 further including a pivoted lever, said clamp including a movable portion secured to said pivoted lever, said clamp further including means biasing said clamp to a closed position, said lever adapted to cooperate with said part of a loom to open said clamp when said inserter reaches an appropriate point in the loom cycle.

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