

[54] **WEFT YARN CONTROL DEVICE**
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 [58] Field of Search.....139/291 C, 302, 303,
 139/116, 7; 26/10.4

[57] **ABSTRACT**

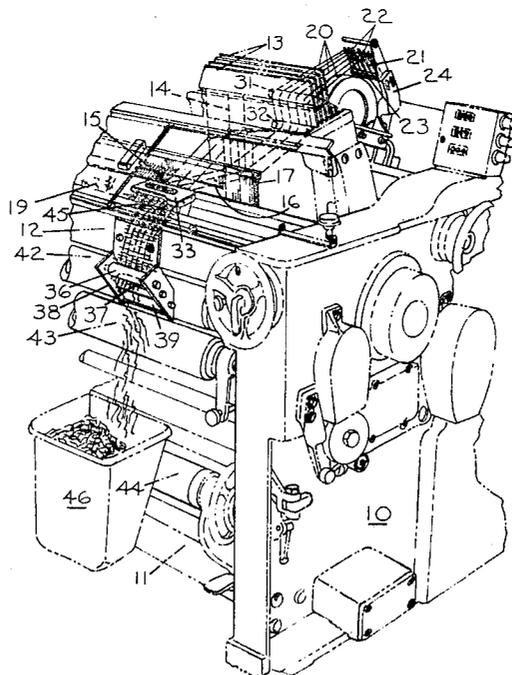
A device for shuttleless looms for receiving and gripping the ends of weft yarns extending from a shed of warp yarns into which they were inserted that permits advancement of the gripped ends in the direction of movement of the fabric as it is formed and after severance of their connections to the edge of the fabric to strip from and dispose of the gripped ends held by the device.

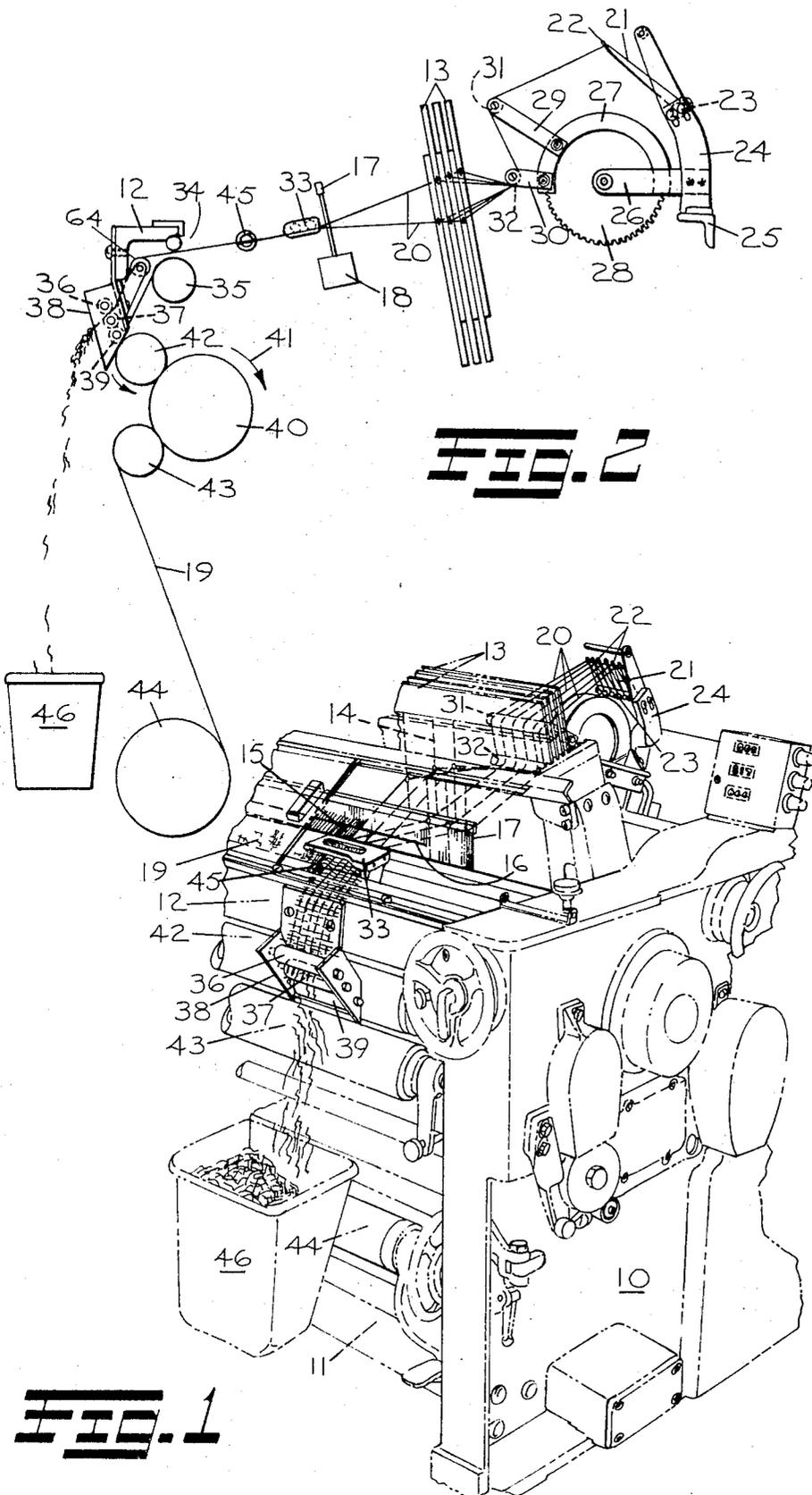
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5 Claims, 4 Drawing Figures





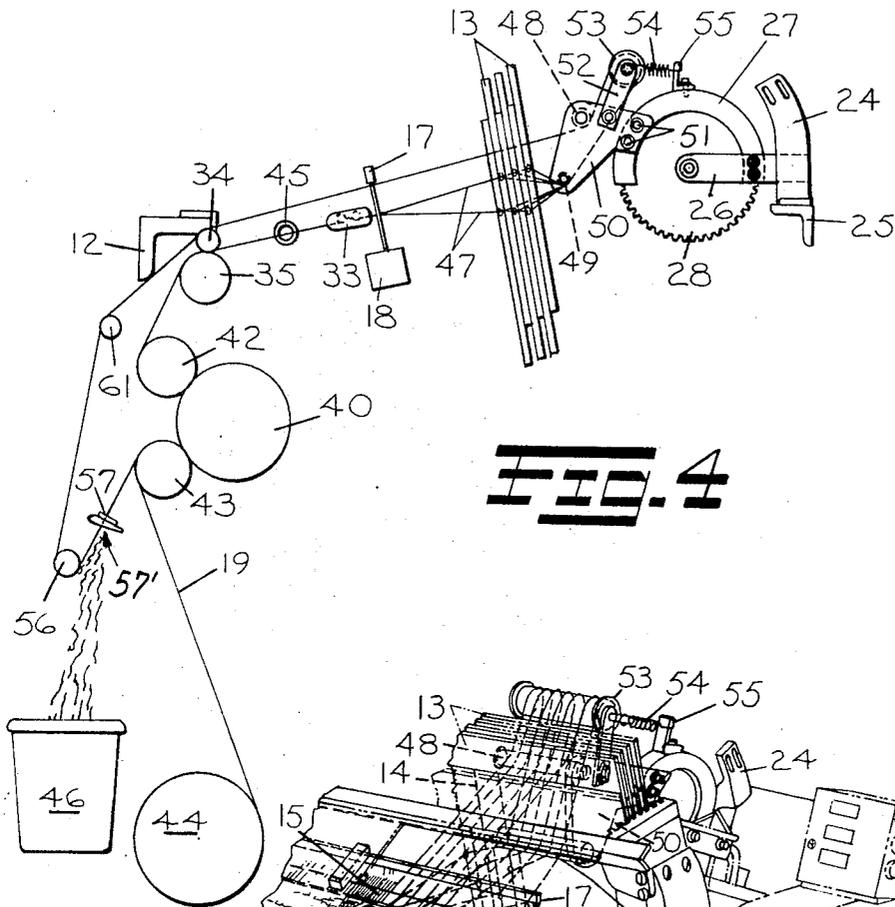


FIG. 4

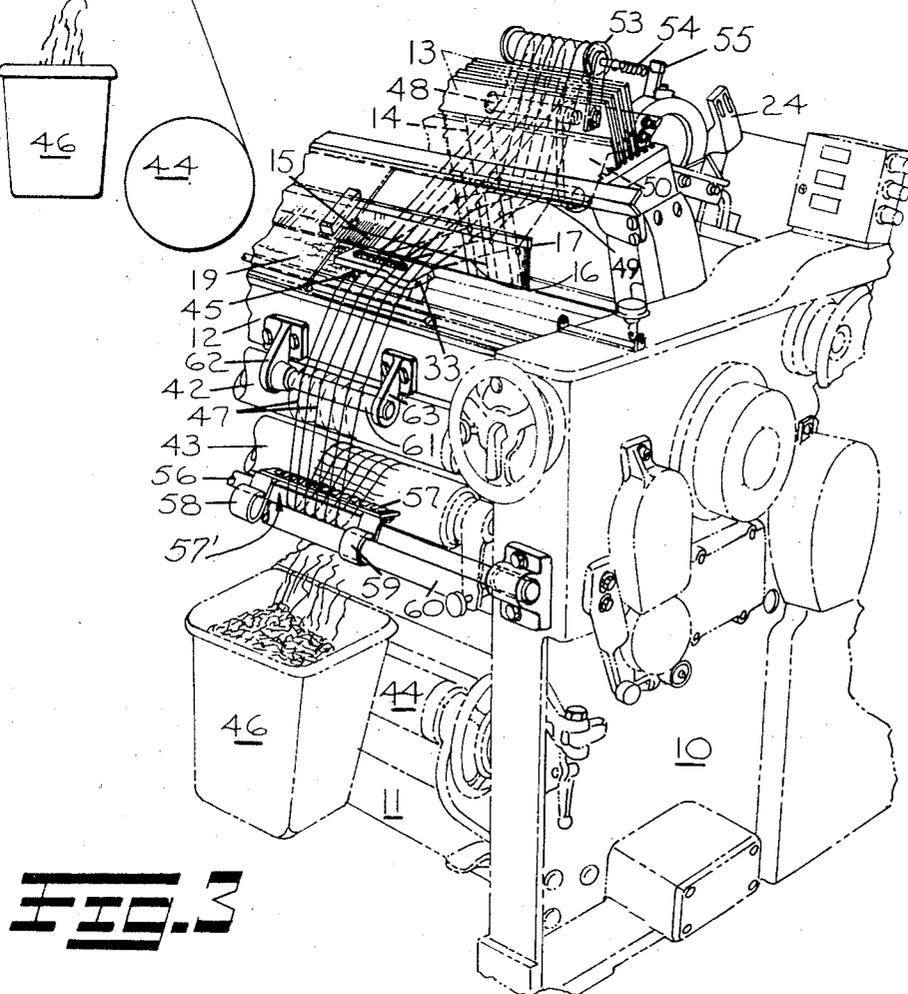


FIG. 3

WEFT YARN CONTROL DEVICE

BACKGROUND OF THE INVENTION

The invention relates to shuttleless looms wherein weft yarn is drawn from a source outside of the loom and inserted as lengths into sheds formed by warp threads. The fabric that is formed on looms of this type have at least one selvage with a fringe like extension.

In looms wherein weft is not interwoven with the warp yarns as in fly shuttle looms to form normal selvages at both sides of the fabric, it is common practice to form a twisted or leno selvage which may be accomplished by feeding and shedding two selvage threads by a means which twists them together and serves as a binding for the fabric edge. U.S. Pat. No. 2,710,631 shows and describes the type of mechanism utilized for binding the edge of this type of fabric.

In addition to the apparatus for forming a leno selvage it was found that a plurality of so-called catch cords operable by the loom heddles and disposed generally parallel with and slightly spaced from the warp yarns improved substantially the control of the weft yarn. The catch cords are disposed and controlled so as to receive and grip the ends of weft yarns after their release by the means for their insertion into a warp shed. By catching and holding the end of weft it is maintained under a desired amount of tension, the possibility of spring back after its release is prevented, whereby the quality and appearance of the fabric is improved.

The known forms of catch cords are those drawn from relatively small spools with the threads thereof passing through and operable by the loom's heddles. These catch cords extend substantially parallel to and are slightly spaced from the edge of the fabric. They operate in timed relation with respect to the release of an inserted weft thread by the inserting means so that the catch cords are caused to shed and grip and hold the weft end. The catch cords are caused to advance with the fabric as it is formed and, by any suitable thread parting device, the weft ends are severed in close proximity to the fabric edge. The fabric is then taken up on a cloth roll in the usual manner and the catch cords with the severed ends of weft are taken up by a separate means and later disposed of.

During the weaving process frequent replacement of the catch cord spools is required while going from a full to exhausted warp yarn beam due to the comparatively smaller size of the catch cord spools which by comparison carry a great deal less yarn. The amount of loom shut down time required to replace the catch cord spools is considered excessive and from an economic standpoint the cost in preparing such spools and the fact that the cords drawn therefrom end as waste material leaves a great deal to be desired relative to a more economical arrangement for performing this function.

The weft yarn control device according to the invention has overcome the undesirable conditions common in known types of catch cord arrangements by providing an improved weft yarn control device which performs the required function of gripping, holding and advancing the ends of weft yarn. This improved weft yarn control forms a permanent part of a shuttleless loom and includes a means for disposing of the severed ends of weft.

SUMMARY OF THE INVENTION

The weft yarn control device of the present invention utilizes a plurality of flexible strand elements such as wire members that extend substantially parallel to the warp yarns and which are operable by the loom's heddles to receive and grip an end of weft yarn inserted into a shed of warp threads. The wire members form a permanent part of the loom and permit the gripped ends of weft to be advanced with and in timed relation to the advancement of the fabric as it is formed. The wire members are slightly spaced from the edge of the fabric and, by any suitable thread cutting device, the connection of each weft end is severed in close proximity with the fabric edge. The severed ends of weft being gripped by the wire members are caused to continue their advance to a position adjacent the front of the loom where they are presented to a stripper arrangement that is effective in removing the weft ends from the wire members.

It is a general object of the invention to provide an improved weft yarn control device of the catch cord type which forms a permanent part of a loom and which does not require periodic replenishment of the catch cords.

A further object is to provide an improved weft yarn control device which compared to known devices is less costly to operate and which in no way detracts from the quality of the fabric formed or the efficacy with which the device performs its intended function.

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

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a portion of a shuttleless loom showing the device according to the invention applied thereto;

FIG. 2 is a schematic showing of the loom and the weft yarn control device in FIG. 1;

FIG. 3 is a view similar to that of FIG. 1 showing a modification of the weft yarn control device; and

FIG. 4 is a schematic showing of the loom and modification of the weft yarn control device in FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Now referring to the figures of the drawings, enough of a shuttleless loom is shown in FIGS. 1 and 3 to serve as a basis for a detailed description of the invention along with the modification applied thereto.

In FIGS. 1 and 3 the forward right hand end of a shuttleless loom is shown and among the various parts thereof there is shown a portion of the right hand loomside at 10. The left hand loomside not shown being in spaced relation to the right is interconnected with the latter by the usual framework elements that include among other parts a front girt 11 and breast beam 12.

The loom's harnesses are shown at 13 and carry the usual heddles 14 through which warp yarns 15 are passed and by which sheds are formed for the reception of inserted lengths of weft yarn 16. The warp yarn is drawn from a warp yarn beam (not shown) carried at the rear of the loom and after passing through the heddles 14 of the harnesses 13 they pass through the so

called dents of a reed 17 that is supported for to and fro movement on a lay beam 18. As is well known to those familiar with the weaving art, the reed is effective in forcing each inserted length of weft forwardly to form fabric identified by numeral 19.

As shown in FIGS. 1 and 2 the preferred form of the weft yarn control device according to the invention includes a plurality of flexible elongated strand members such as stainless steel wires 20 which are disposed in spaced relation to the edge of the fabric and which extend substantially parallel therewith. Individual to each of these wires 20 there is provided a pivotal spring biased lever 21 to which the rearward end of each wire is attached as at 22. These levers 21 are mounted on a common shaft 23 that is carried by a support bracket 24 the latter of which is mounted upon a frame member 25. Adjacent the base of the support bracket 24 a forwardly extending extension 26 is provided and has attached intermediate its ends a forwardly directed housing bracket 27 which in addition to its intended purpose of housing an unrelated gear member 28, serves as a mounting base for a pair of forwardly directed support arms 29 and 30. These support arms 29 and 30 carry guide rollers 31 and 32 respectively on their forward ends and provide supporting surfaces for the wires 20 intermediate their attachment to levers 21 and the individual heddles 14 through which they extend. From the heddles 14 the wires extend through separate dents of the reed 17 and then pass through the loom temple 33 which in a well known manner also serves to grip the edge of the fabric 19 to prevent excessive contraction thereof.

Forwardly of the temple 33 the wires 20 pass beneath a guide roll 34 and over guide roll 64.

The present invention is shown applied to a shuttleless loom of the liquid jet type and the use of a vacuum tube such as 35 serves to withdraw excessive moisture absorbed in the fabric. It should be understood that the instant invention is equally applicable to other looms which utilize catch cord devices for controlling the ends of weft yarns.

At the front of the loom the forward ends of the wires 20 are clamped and fixedly held between a pair of roller members 36 and 37 that are carried in a generally U shaped support bracket 38 that is attached to and depends from the breast beam 12 (FIGS. 1 and 2). A third roller member 39 is carried in the support bracket 38 and being covered with a resilient material and in frictional contact with roller 37 is effective in rotating roller members 36 and 37 in a manner and for a purpose to be more fully explained.

The loom is provided adjacent the front thereof with the usual take-up roll 40 that is rotated in a positive manner from a suitable source of drive on the loom in the direction of the indicating arrow 41 (FIG. 2). A pair of pressure rolls 42 and 43 are in contact with the outer periphery of the take-up roll 40 and with the newly formed fabric being entrained about these three rolls in a conventional manner said fabric 19 is advanced in the direction of a cloth roll 44 upon which it is wound.

As shown in FIGS. 1 and 2 any suitable weft yarn parting device such as a so-called hot wire cutter 45 may be utilized to sever the weft yarns 16 immediately adjacent to the edge of the fabric 19 and the severed

ends being held by the wires 20 are pushed toward the front of the loom by the beat-up action of the reed 17 where they are disposed of by a stripper means in the manner now to be described.

Referring to FIG. 2, pressure roll 42 is in frictional contact with the take-up roll 40 and is rotated in anti-clockwise direction, its contact with roller members 36 and 37 through roller member 39 effects clockwise movement of roller member 36 and anti-clockwise movement of roller member 37. Rotation of roller members 36 and 37 maintains a firm gripping action upon the forward ends of the wires 20. Thus, as the severed ends of weft are incrementally advanced by the beat up action of the reed toward the front of the loom they are caused to pass between said roller members and stripped from the wire members. When the severed ends of weft are stripped from the wires 20 they are collected in any suitable form of receptacle such as that indicated by numeral 46 or may be disposed of by such means as a vacuum tube (not shown).

The modification of the weft yarn control device being shown in FIGS. 3 and 4 utilize a plurality of endless wire members 47 and like wire members 20 are caused to be actuated by the loom's heddles 14 to receive and grip the end of each inserted length of weft yarn. Adjacent the rear of the loom the endless wire members 47 are supported and guided by a pair of stationary rollers 48 and 49 carried on a support bracket 50 that is fixedly attached to the arcuated housing bracket 27 by bolts 51. An upwardly directed arm 52 (FIG. 4) is pivotally attached to the support bracket 50 and is provided at its upper end with a laterally extending roller member 53 about which the endless wire members 47 extend and which forms the rearmost guiding surface for said wire members.

A coil spring 54 having one end attached to the upper end of arm 52 and the opposite end to a retaining finger 55 that is assembled to the upper surface of the arcuated housing bracket 27, provides a biasing force for the roller member 53 which maintains the wire members 47 under tension when actuated by the heddles 14.

The endless wire members 47 extend from the roller member 53 generally forward and beneath the stationary roller 49 thence forwardly and through individual heddles 14 which are effective on shedding the wire members for receiving and gripping the end of each insert weft yarn. From the heddles 14 the wire members 47 extend forwardly through the dents of the reed 17, the temple 33 and then beneath the guide roll 34 and across the upper portion of the vacuum tube in the same manner as the wire members 20 shown in FIG. 2 of the preferred embodiment.

After leaving the upper portion of the vacuum tube 35 the wire members 47 follow the same path as the newly formed fabric 19 by passing about the lower portion of pressure roll 42, rearwardly around the surface of the take-up roll 40 and then over the upper portion of pressure roll 43.

After leaving the surface of the pressure roll 43 the fabric 19 continues moving downwardly where it is taken up and wrapped upon the cloth roll 44. The endless wire member 47 when leaving the surface of the pressure roll 43 extends downwardly and forwardly about a guide bar 56 disposed at the front of the loom.

As described the take-up roll 40 is driven in a positive manner and provides a means for advancing the endless wires 47 along with the severed ends of weft yarn which were cut by the hot wire cutter 45. Intermediate the pressure roll 43 and the guide bar 56 the wire members 47 are caused to move between cutter blades 57 which form the teeth of a comb-like member 57'. This comb-like member is supported adjacent the front of the loom by brackets 58 and 59 that are assembled on a horizontally disposed bar 60 (FIG. 3).

As the endless wire members 47 moved between the cutter blades 57, the ends of weft yarn are again cut intermediate each wire which permits them to fall free of the loom and into the aforementioned receptacle 46.

From the guide bar 56 the endless wire members 47 move upwardly over the forward surface of a guide rod 61 the ends of which are supported in hangar brackets 62 and 63 that are assembled on the forward surface of the breast beam 12 (FIG. 3). The wire members then move upwardly over the upper surface of guide roll 34, through the upper portion of the reed 17 and harnesses 13 then make contact with the lower portion of the stationary roller 48. Continued movement of the endless wire member after leaving roller 48 brings them back into contact with roller 53, which completes the path of travel of said wire members.

To summarize the operation the ends of the wire members 20 of the preferred form of the invention are fixedly held adjacent the front and rear of a loom and are slightly spaced from the warp yarns and fabric.

The loom's heddle through which the wire members extend are effective in shedding the latter so as to receive and grip each end of weft yarn after its insertion into a shed formed of warp yarns.

With each beat-up movement of the reed, the ends of weft being held by the wire members are forced forwardly along with normal advancement of the newly formed fabric. A suitable weft cutting device situated forwardly of the loom's temple severs the weft ends immediately adjacent to the fabric and the severed ends retained by the wire member are continued to be pushed forwardly with each beat-up movement of the reed. The severed ends of weft being held by the wire members are stripped from the latter as they pass between the rotating roller members 36 and 37.

The endless wire members 47 of the modified form of the invention are actuated by the loom's heddles in the same manner as wire members 20. The endless wire members through their engagement with the take-up roll 40 and numerous supporting and guiding elements are caused to travel in a cycled pathway depthwise of the loom. After the ends of the inserted weft yarns have been severed immediately adjacent to the fabric edge,

the severed portions retained by the endless wire members 47 are carried forwardly by the latter and presented to a stripper means comprising a comb member 57. The teeth of this comb member are in the form of cutting blades 57 and as the endless wire members move therethrough each end is again cut intermediate each adjacent wire which permits the severed pieces to fall free of the loom and to be collected into any suitable form of receptacle.

Although the present invention has been described in connection with 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 considered to be within the purview and scope of the invention and the appended claims.

I claim:

1. A weft yarn control device for use with a shuttleless loom having a lay beam and reed, heddles for forming sheds of warp yarns into which weft yarn in the form of cut lengths is inserted, said weft yarn control device comprising flexible elongated means extending substantially parallel to the warp yarns and operable by the loom heddles to receive and grip end of the inserted weft, parting means for cutting the gripped end of weft intermediate said flexible elongated means and warp yarns, and stripper means mounted adjacent the front of the loom for engagement with the weft ends held in said elongated means to remove the ends therefrom.

2. The weft yarn control device according to claim 1 wherein said flexible elongated means comprises a plurality of wire members having end portions secured adjacent the front of the loom to said stripper means.

3. The weft yarn control device according to claim 2 wherein said stripper means includes a pair of juxtaposed rotating roller members between which the end portion of said wire members are held and from which the ends of the weft yarn are stripped from said wire members.

4. The weft yarn control device according to claim 1 wherein said flexible elongated means comprises a plurality of endless wire members with means for effecting their advancement with the weft ends held thereby to said stripper means.

5. The weft yarn control device according to claim 4 wherein said stripper means includes a comb member through which said endless wire members are caused to advance with cutting blade members carried by the teeth thereof for severing each end of weft adjacent each wire member.

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