

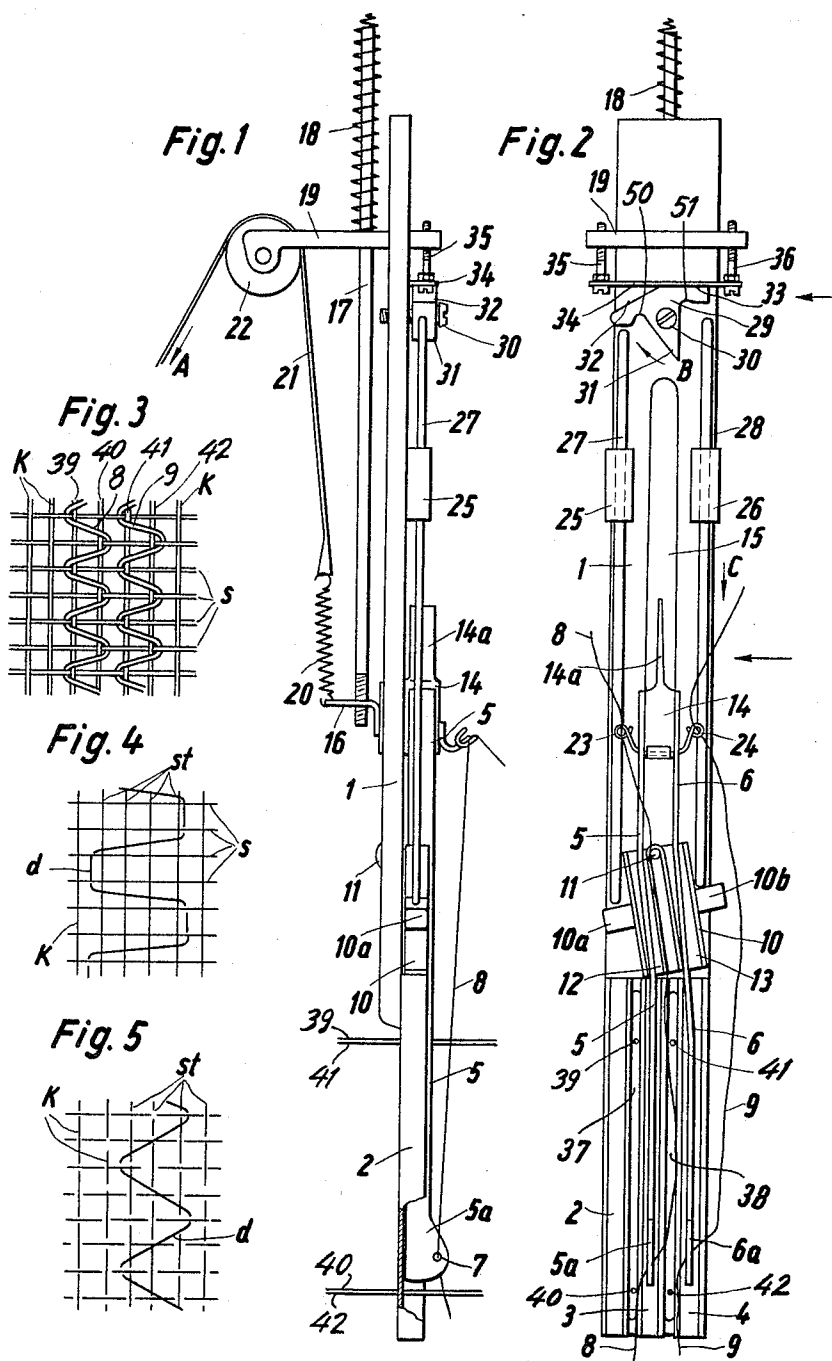
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APPARATUS FOR FORMING SELVEDGES CONTAINING TURNING THREADS

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1

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APPARATUS FOR FORMING SELVEDGES
CONTAINING TURNING THREADSRudolf Rietzler, Ramsdorf, Westphalia, Germany, as-
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The invention relates to apparatus for forming selvedges containing turning threads. It is known in the art to produce selvedges in fabrics which are to be divided in the warp direction, by means of the introduction of so-called turning threads into the fabric during the weaving process. According to a known method a turning thread is introduced into the shed during the weaving in such a manner that it interlaces with the warp threads. The invention relates to apparatus for such processes.

In most previously known apparatus of this kind, a turning thread is interwoven with only a single warp thread (the so-called stationary or standing thread). Such simple turning results in a comparatively weak selvedge.

Also known in the art is apparatus for winding a turning thread about a plurality of standing threads, however, such apparatus is quite complicated. Consequently, as a rule, only apparatus for winding turning-thread loops about only one standing thread has been heretofore employed.

It is an object of the invention to provide simply constructed apparatus by means of which, for each selvedge to be produced, a turning thread is interwoven with the warp threads over more than two stationary threads.

It is a further object of the invention to provide a control device for alternately diverting a pair of elastic healds supported on a reciprocating slide into two pairs of guides such that standing threads which are located between the guides are interwoven with turning threads which are engaged by the healds.

In accordance with a preferred embodiment of the invention, in which selvedges containing turning threads are formed, there is provided slide means for undergoing reciprocal movement and a pair of spaced healds secured to the slide means for undergoing movement therewith. The healds each engage a turning thread which is guided by the respective heald. Three longitudinal guides, constituting two pairs of adjacent guides, are adjacent the slide means and the healds are adapted for alternately passing in the pairs of guides as the healds undergo reciprocal movement.

The apparatus further comprises a control device for alternately diverting the elastic healds into the pairs of guides, which device comprises a pair of pivotally supported members, one of which is a guide member located adjacent the guides and having a pair of guide paths in which the healds are slidably supported. The other of the members is a control member which is pivotally movable between first and second positions.

The control device further comprises means on the slide means for moving the control member between said positions in alternation for each cycle of reciprocal movement of the slide means. The healds are supported on the slide means such that they are free from the guides as the control member is being pivotally moved. The control device further comprises means extending between the members to cause the guide member to undergo pivotal movement in concurrence with the control member between alternate positions in which the guide paths are associated with respective pairs of guides to restrict passage of the healds into the particular pair of guides, whereby standing threads which are located be-

2

tween the guides are interwoven with the turning threads which are engaged by the healds.

An embodiment of the invention is shown in the accompanying drawing, in which:

FIGURE 1 is a side view of the embodiment of the invention;

FIGURE 2 is a front view of the embodiment shown in FIG. 1;

FIGURE 3 is a plan view of a selvedge as produced by the embodiment shown in FIGS. 1 and 2; and

FIGURES 4 and 5 are plan views of selvedges of alternate form which can be produced by the embodiment shown in FIGS. 1 and 2.

Fixed at the lower end of a vertically arranged base plate 1 are three longitudinal guides 2, 3, 4, which serve as guides for two elastic healds 5 and 6. The bottom ends 5a and 6a of the healds 5 and 6 are provided with eyes 7, through which a turning thread 8 or 9 can be drawn. The top ends of the healds 5, 6 are secured to a slide 14 which can be caused to reciprocate vertically in a slot 15 of the base plate 1. The slide 14 is provided with an angle 16, into which is screwed a rod 17, which carries at its top end a compression spring 18, which abuts against and is supported by a transverse member 19 fixed to the base plate 1. In addition there is connected to angle 16 a tension spring 20, to which is connected a tension member 21, which travels over a roller 22 supported on the transverse member 19. The slide 14 supports two eye members 23, 24, for the turning threads 8 and 9.

Directly above the guides 2, 3, 4, there is provided a guide member 10 which is pivotally connected to the base plate 1 by means of a pin 11. The guide member 10 comprises two guides 12 and 13 for the healds 5 and 6. In one position of guide member 10 the lower ends of the guides 12 and 13 are coincident with the upper ends of the guides 3 and 4, as illustrated in FIG. 2. After the guide member 10 has been pivotally moved, the lower ends of the guides 12 and 13 are coincident with upper ends of the guides 2 and 3. The guide member 10 comprises two arms 10a, 10b. Guided at the two side edges of the base plate 1, by means of guides 25, 26, are two rods 27, 28, whose lower ends freely engage the arms 10a and 10b. The top ends of the rods 27, 28, extend towards a pivotally supported control member 29, which can be pivoted about a pin 30. The member 29 comprises a central downwardly extending point-shape portion 31 and, on the opposite side of the pivoting pin 30, two abutting surfaces 32, 33 forming an obtuse angle with respect to each other. The member 29 engages by means of one of said abutting faces (abutting face 33 in FIG. 2) a leaf spring 34 which is secured to the transverse piece 19 by means of screws 35, 36. The slide comprises an inwardly extending thin flexible tongue or blade 14a. The pins 11 and 30 supporting the guide member 10 and control member 29 respectively are located on a longitudinal line approximately midway between rods 27, 28.

The apparatus operates in the following manner:

When the tension member 21 is pulled in the direction of the arrow A by a dobby or the like during operation of the loom, the slide 14 is moved upwardly. When the slide 14 has reached the topmost position of its motion, the healds 5 and 6 are completely extracted from the guides 3 and 4, so that their bottom ends 5a, 6a are free from the guides 3, 4 and are located in the guides 12 and 13 of the guide piece 10.

As the slide approaches the highest position thereof, elastic tongue or blade 14a strikes against one side or flank of the point-shape portion 31 of the pivoting member 29 and deflects slightly so that as the slide 14 is

3

moved further upwardly the tongue 14a presses against the side of the member 29 and is accommodated in one of two notches 50, 51 adjacent the point-shape portion 31 (in the case shown, notch 50) to cause the member 29 to be pivotally moved in the direction of the arrow B. Pivoting control member 29, consequently, pivots, due to the action of the spring 34, to such an extent that the abutting face 32 abuts against the spring 34. This causes the rod 28 to move in the direction of the arrow C. The rod 28 presses on the arm 10b and pivotally moves the guide member 10 from the position illustrated in FIG. 2 to a position in which the guides 12 and 13 are coincident with the guides 2 and 3.

When the force on tension member 21 in the direction of the arrow A stops, the slide 14 is pushed downwardly to the position shown in FIG. 2, due to the action of the spring 18. This causes the healds 5 and 6 to move into the guides 2 and 3. When the tension member 21 is subsequently pulled once more in the direction of the arrow A, the healds are again pulled out of the guides 2 and 3, the member 29 is again pivotally moved, this time to the position shown in FIG. 2, by the tongue or blade 14a, and upon the return of the slide 14, the healds 5 and 6 are again moved into the guides 3 and 4.

In this manner, the turning threads 8 and 9 are introduced, each time the tension member 21 has been actuated, into the shed of the loom by an offset distance corresponding to the distance between two guides 2, 3 and 4.

FIG. 3 shows, by way of example, a selvage which is produced by means of the arrangement in FIGS. 1 and 2. In this figure the stationary threads are constituted by threads 39, 40, 41 and 42. K are the other warp threads, s are the weft threads, and 8 and 9 are the turning threads. The standing threads 39, 40, 41, 42, which are to be interwoven with the turning threads 8 and 9, are drawn through slots 37, 38, between the longitudinal guides 2 and 3; and 3 and 4 respectively. As the slide 14 is reciprocated under the control of tension member 21, in accordance with the operation of the loom, the threads 8 and 9 are respectively interwoven with standing threads 39 and 40; and 41 and 42 as shown in FIG. 3.

The arrangement according to FIGS. 4 and 5 are different weaves of interwoven turning threads d with the standing threads st. In FIG. 4 it is seen that the turning thread is interwoven with four warp threads over a span of three weft threads, while in FIG. 5 the turning thread is interwoven with three warp threads over a span of three weft threads. Weaves such as shown in FIG. 5 offer the advantage that in spite of great strength caused by a plurality of standing threads, they produce a selvage of slight bulk only, while a considerable selvage thickness is required to bring about the great selvage strength in the weave according to FIG. 4.

Numerous modifications and variations of the disclosed embodiment will become apparent to those skilled in the art without departing from the scope and spirit of the invention as defined by the following claims.

What is claimed is:

1. An apparatus for the forming of selvages containing turning threads, said apparatus comprising: slide means for undergoing reciprocal movement in a longitudinal direction, a pair of spaced healds secured to said slide means for undergoing reciprocal movement therewith, said healds each engaging a turning thread which is guided thereby, means defining three longitudinal guides constituting two pairs of adjacent guides in which said healds are allowed to alternately pass as they undergo said reciprocal movement, there being standing threads located between said longitudinal guides, guide means pivotally supported adjacent said longitudinal guides at a fixed location and defining a pair of guide paths, said guide means being pivotally movable between first and second guiding positions in which said guide paths respectively coincide with alternate pairs of said adjacent guides, and means

4

responsive to said reciprocal movement of the slide means for alternately pivoting said guide means between said guiding positions to cause said healds to alternately pass in the different pairs of said adjacent guides for successive cycles of reciprocal movement of said slide means, whereby said standing threads are interwoven with said turning threads.

2. The apparatus as claimed in claim 1, wherein said guide means comprises a guide member including a pair of guide elements each respectively defining one of said guide paths.

3. The apparatus as claimed in claim 1, wherein said means responsive to the reciprocal movement of the slide means comprises a control member supported for pivotal movement between first and second angular positions, a pair of longitudinal rods extending between said control member and said guide means, and positioned relative to said control member for being displaced thereby upon pivotal movement thereof between said angular positions.

4. The apparatus as claimed in claim 3, wherein said means responsive to the reciprocal movement of the slide means comprises a flexible tongue on said slide means facing said control member for contacting the same as said slide means undergoes said reciprocal movement to successively pivotally move said control member between said angular positions.

5. The apparatus as claimed in claim 1, comprising eye members on said slide means for guidably engaging said turning threads.

6. The apparatus as claimed in claim 1, wherein said healds are constituted of elastic material.

7. The apparatus as claimed in claim 1, wherein said guide means is operatively positioned with respect to said slide means so that said healds are always accommodated in said guide paths and are displaced therewith as said guide means is pivotally moved between said guiding positions.

8. An apparatus for the forming of selvages containing turning threads, said apparatus comprising: a base plate, a slide supported on said base plate for displacement in a longitudinal direction, means engaging said slide for causing the same to undergo reciprocal movement in said longitudinal direction, a pair of spaced longitudinal healds secured to said slide for undergoing reciprocal movement therewith, said healds each engaging a turning thread which is guided thereby, three transversely spaced longitudinal guide elements defining two pairs of adjacent guide passages in which said healds are allowed to alternately pass as they undergo said reciprocal movement, said guide elements being operatively located relative to said slide and said healds so that the latter are free from said guide passages with said slide in a position furthest from said guide elements, a guide member pivotally supported on said base plate at a location adjacent said guide elements and slidably supporting said healds in guide paths provided in said guide member, the latter being pivotally movable between first and second guiding positions in which said guide paths are respectively in association with separate pairs of said guide passages so that said healds are diverted into a particular pair of guide passages in correspondence with the position of said guide member, and means responsive to said reciprocal movement of the slide for alternately pivoting said guide member between said guiding positions for each cycle of said reciprocal movement of the slide, the latter means comprising a control member pivotally supported from said base plate for pivotal movement between first and second angular positions, a pair of longitudinal rods guidably supported from said base plate for slidable movement, each of said rods extending between said guide member and said control member, and means on said slide for contacting said control member to alternately pivotally move the same between said first and second angular positions to cause said control member to alter

nately displace said rods which in turn causes alternate pivotal displacement of said guide member.

9. An apparatus for the forming of selvages containing turning threads, said apparatus comprising: a base plate, a slide slidably supported on said base plate for longitudinal movement, means engaging said slide for causing the same to undergo reciprocal movement in a longitudinal direction, a pair of spaced longitudinal healds secured to said slide for undergoing reciprocal movement therewith, said healds each engaging a turning thread which is guided thereby, three transversely spaced longitudinal guide elements, the central guide element defining with the adjacent guide elements two pairs of guide passages in which said healds are allowed to alternately pass as they undergo said reciprocal movement, said guide elements being operatively located relative to said slide and said healds so that the latter are free from said guide passages with said slide in a position furthest from said guide elements, a guide member pivotally supported on said base plate at a location adjacent said guide elements and slidably supporting said healds, said guide member defining a pair of guide paths and being pivotally movable between first and second positions in which said guide paths are respectively in association with separate pairs of said guide passages so that said healds are diverted by said guide member into different pairs of guide passages in accordance with the position of said guide member, and means responsive to said reciprocal movement of the slide for alternately pivoting said guide member between said positions for successive cycles of said reciprocal movement of the slide, the latter means comprising a pair of arms extending transversely from said guide member, a longitudinal rod for each arm guidably supported from said base plate for contacting the associated arm to pivotally move said guide member between said positions, and a control member pivotally supported on said base plate for being contacted by said slide to be alternately pivotally moved in opposite directions and thereby contact and displace a respective rod for each direction of pivotal movement.

10. In a loom for weaving fabrics, the provision of an apparatus for the forming of selvages containing turning threads, said apparatus comprising: a base plate, a slide slidably supported on said base plate for longitudinal movement, means engaging said slide for causing the same to undergo reciprocal movement synchronized with the operation of the loom, a pair of spaced longitudinal healds secured to said slide for undergoing reciprocal movement therewith, said healds each engaging a turning thread which is guided thereby, three transversely spaced longitudinal guide elements defining two pairs of adjacent guide passages in which said healds are allowed to alternately pass as they undergo said reciprocal movement, said guide elements being operatively located relative to said slide and said healds so that the latter are free from said guide passages with said slide in a position furthest from said guide elements, a guide member pivotally supported on said base plate at a location adjacent said guide elements and in the path of said healds, said guide member defining a pair of guide paths and being pivotally movable between first and second guiding positions in which said guide paths are respectively in association with separate pairs of said guide passages so that said healds are diverted into different pairs of guide passages in accordance with the position of said guide member, and means responsive to said reciprocal movement of the slide for alternately pivoting said guide member between said guiding positions for successive strokes of said slide, the latter means comprising a pair of arms extending transversely from said guide member, a longitudinal rod for each arm guidably supported from said base plate for contacting the associated arm and pivotally moving said guide member between said guiding positions, a control member pivotally supported on said base plate for pivotal

movement between first and second angular positions, said control member including a point-shape portion facing said slide and having a surface opposite said point-shape portion constituted by two faces defining an obtuse angle, a transversely extending elastic member operatively positioned with respect to said control member to be in contact with respective faces thereof for said angular positions, and a flexible tongue on said slide facing said control member for contacting said point-shape portion as said slide reaches said furthest position to pivotally displace said control member in alternation upon successive cycle of reciprocal movement of said slide, said control member having opposite ends which contact and displace a respective rod for each direction of said pivotal movement of the control member.

11. In a loom, the apparatus as claimed in claim 10, wherein said control member is provided with notches adjacent said point-shape portion for accommodating therein said tongue which is deflected by said point-shape portion.

12. In a loom, the apparatus as claimed in claim 10, wherein said means for causing the slide to undergo said reciprocal movement comprises a tension member coupled to said slide for exerting a force thereon in synchronization with said operation of the loom to displace said slide, and a spring acting on said slide in a direction opposite to said force for returning said slide to the original position thereof when said force is terminated.

13. In a loom, the apparatus as claimed in claim 12, wherein said tongue is centrally positioned between said rods.

14. In a loom, the apparatus as claimed in claim 10, comprising pivots respectively supporting said guide member and said control member from said base plate, said pivots being arranged along a line substantially midway between said rods.

15. An apparatus for the forming of selvages containing turning threads, said apparatus comprising: slide means for undergoing reciprocal movement in a longitudinal direction, a pair of spaced healds secured to said slide means for undergoing reciprocal movement therewith, said healds each engaging a turning thread which is guided thereby, means defining three longitudinal guides constituting two pairs of adjacent guides in which said healds are allowed to alternately pass as they undergo said reciprocal movement, guide means pivotally supported adjacent said longitudinal guides at a fixed location and defining a pair of guide paths, said guide means being pivotally movable between first and second guiding positions in which said guide paths respectively coincide with alternate pairs of said adjacent guides, control means pivotally movable between first and second angular positions, means on said slide means for pivotally moving said control means in alternation between said angular positions for successive cycles of said reciprocal movement of the slide means, and means extending between said guide means and said control means for pivotally moving said guide means in concurrence with said control means so that said healds alternately pass in the different pairs of said adjacent guides for successive cycles of reciprocal movement of said slide means, whereby standing threads which are located between said guides are interwoven with said turning threads.

16. A control device for alternately diverting a pair of elastic healds, supported on a reciprocating slide, into two pairs of guides, said device comprising: a pair of pivotally supported members, one of said members being a guide member located adjacent said guides and having a pair of guide paths in which said healds are slidably supported, the other of said members being a control member which is pivotally movable between first and second positions, means on said slide for moving said control member between said positions in alternation for each cycle of reciprocal movement of said slide, said healds

7

being supported on said slide so that said healds are free from said guides as said control member is being pivotally moved, and means extending between said members to cause said guide member to undergo pivotal movement in concurrence with said control member between alternate positions in which said guide paths are associated with respective pairs of guides to restrict passage of said healds into the particular pair of guides.

17. The device as claimed in claim 16, wherein said control member has a surface with two faces defining an obtuse angle, and the device further comprises a flat elastic member adjacent said control member in contact with a respective face thereof for said first and said second positions.

18. The device as claimed in claim 17, wherein said means for moving the control member is a thin flexible tongue facing said control member, the latter including a point-shape central portion facing said tongue for deflecting the same as it contacts said central portion to permit said tongue to pivotally move said control member.

19. The device as claimed in claim 18, wherein said means to cause the guide member to undergo said pivotal movement comprises a pair of spaced slidable rods, said guide member including a pair of transversely extending

8

opposite arms, each being associated with a rod so that pivotal movement of said control member causes the displacement of one of said rods which in turn causes concurrent pivotal movement of said guide member.

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