(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 867 544 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.09.1998 Bulletin 1998/40

(51) Int. Cl.[6]: **D03D 51/00**

(21) Application number: **98101073.9**

(22) Date of filing: **22.01.1998**

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **24.03.1997 JP 88802/97**

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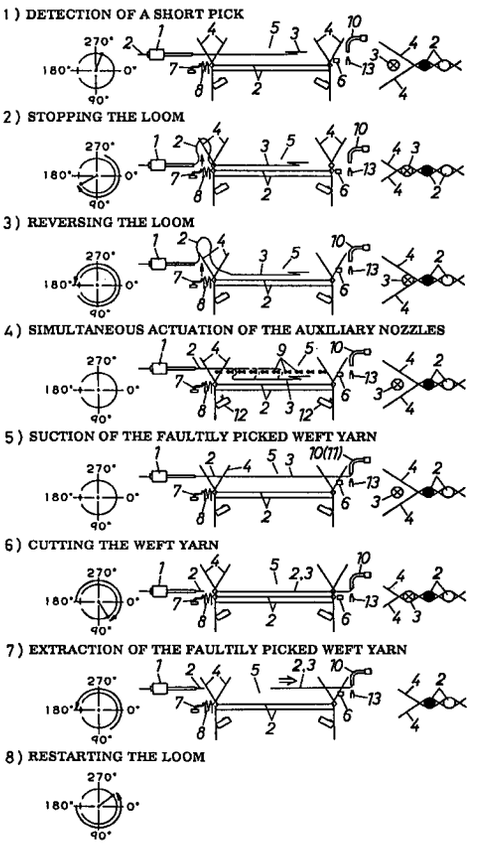
(54) Faultily picked weft yarn disposal method

(57) A faultily picked weft yarn removing method comprises steps of stopping a loom with a faultily picked weft yarn (3) kept continuous with a weft yarn (2) extending from a main picking nozzle (1) upon the occurrence of a mispick, opening the cloth fell of a fabric on the loom, feeding a length of the weft (2) necessary for removing the faultily picked weft yarn (3), making a plurality of auxiliary picking nozzles (9) arranged along a path of the picked weft yarn (2) jet air to separate the faultily picked weft yarn (3) in a U-shape from the cloth fell and to make the leading end of the faultily picked weft yarn (3) reach a faultily picked weft yarn extracting means (11) (stretching nozzle (10)), and drawing the faultily picked weft yarn (3) by the faultily picked weft yarn extracting means (11) to remove the faultily picked weft yarn (3) from the shed (5).

FIG.1



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Description

The present invention relates to a method of disposing of a faultily picked weft yarn in the cloth fell of a fabric on a loom upon the occurrence of a mispick.

Methods of removing a faultily picked weft yarn from the cloth fell of a fabric are disclosed in JP-B Nos. 6-27399 and 7-122199. These prior art methods stops the loom with a faultily picked weft yarn connected to a main picking nozzle upon the occurrence of a mispick, reverses the loom so as to open the cloth fell so that the faultily picked weft yarn is released, picks a weft yarn continuous with the faultily picked weft by the main picking nozzle to transfer the weft continuous with the faultily picked weft to a drawing device disposed on a drawing side opposite a picking side, and then the faultily picked weft yarn is pulled out of the cloth fell along a U-shaped path.

A method of removing a faultily picked weft yarn disclosed in JP-A No. 61-245339 keeps a faultily picked weft yarn connected to a weft yarn extending in a main picking nozzle upon the occurrence of a mispick, and draws the faultily picked weft yarn toward a picking side to remove the faultily picked weft yarn from the cloth fell.

The former method, i.e., the method disclosed in JP-B No. 6-27399 or 7-122199, needs to waste a great length of a weft yarn to remove the faultily picked weft yarn; that is, a length of a weft yarn for two picks is necessary to transfer the faultily picked weft yarn to the drawing device disposed on the drawing side. Although the latter method, i.e., the method disclosed in JP-A No. 61-245339, needs only several loops of a weft yarn unwound from a yarn storage drum of a yarn measuring and storing device, the force exerted on the faultily picked weft yarn from the picking side does not work effectively as force for separating the faultily picked weft yarn from the cloth fell, so that the operation for removing the faultily picked weft yarn is unreliable.

Accordingly, it is an object of the present invention to provide a faultily picked weft yarn disposal method capable of surely separating a faultily picked weft yarn from the cloth fell of a fabric upon the occurrence of a mispick and of disposing of the faultily picked weft yarn with reliability using the least necessary length of a weft yarn.

With the foregoing object in view, according to one aspect of the present invention, a faultily picked weft yarn disposal method comprises steps of stopping a loom with a faultily picked weft yarn kept continuous with a weft yarn extending from a main picking nozzle upon the occurrence of a mispick, reversing the loom to open the cloth fell so that the faultily picked weft yarn is released from the cloth fell, feeding a length of the weft yarn necessary for making the leading end of the faultily picked weft yarn reach a faultily picked weft yarn extracting means disposed on a drawing side opposite a picking side from which the weft yarn is picked into a shed, making a plurality of auxiliary picking nozzles arranged along a path of a picked weft yarn jet a fluid to separate the faultily picked weft yarn in a U-shape from the cloth fell and to make the leading end of the faultily picked weft yarn reach the faultily picked weft yarn extracting means, and drawing the faultily picked weft yarn by the faultily picked weft yarn extracting means to remove the faultily picked weft yarn from the shed.

The length of weft yarn necessary for making the leading end of the faultily picked weft yarn reach the faultily picked weft yarn extracting means is fed by making a feed nozzle disposed near the main picking nozzle jet a fluid to pull out the weft yarn extending within the main picking nozzle, by making the main picking nozzle jet a fluid to pull out the weft yarn extending within the main picking nozzle, or by making a feed nozzle disposed near the main picking nozzle jet a fluid to pull out the weft yarn extending within the main picking nozzle and making the main picking nozzle jet a fluid to insert the weft yarn thus pulled out from the main picking nozzle into a shed.

The faultily picked weft yarn extracting means may be a stretching nozzle or one or two rollers specially designed for taking up the faultily picked weft yarn.

According to another aspect of the present invention, a faultily picked weft yarn disposal method comprises steps of stopping a loom with a faultily picked weft yarn kept connected to a weft yarn extended in a main picking nozzle upon the occurrence of a mispick, opening the cloth fell so that the faultily picked weft yarn is released from the cloth fell, jetting a fluid by a plurality of auxiliary nozzles arranged along a path of the picked weft yarn to separate the faultily picked weft yarn from the cloth fell, feeding a length of the weft yarn necessary for making the leading end of the faultily picked weft yarn reach a faultily picked weft yarn extracting means disposed on a drawing side opposite a picking side from which the weft yarn is picked into a shed so that the leading end of the faultily picked weft yarn reaches the faultily picked weft yarn extracting means, and drawing the faultily picked weft yarn by the faultily picked weft yarn extracting means to remove the faultily picked weft yarn from the shed.

According to a third aspect of the present invention, a faultily picked yarn disposal method comprises steps of: stopping a loom with a faultily picked yarn kept continuous with a weft yarn extending from a main picking nozzle upon the occurrence of a mispick; opening the cloth fell of a fabric on the loom so that the faultily picked yarn is released from the cloth fell; feeding a length of the weft necessary for making the leading end of the faultily picked yarn reach a faultily picked yarn drawing means disposed on a drawing side opposite a picking side from which a weft yarn is picked into a shed; making a plurality of auxiliary picking nozzles arranged along a path of the picked weft yarn jet a fluid to separate the faultily picked yarn in a U-shape from the cloth fell and to transfer the leading end of the faultily picked yarn to a faultily picked yarn drawing means; drawing

the faultily picked yarn by the faultily picked yarn drawing means to straighten the faultily picked yarn in the shed; and restarting the loom.

The faultily picked weft yarn disposal method of the present invention is able to remove a faultily picked weft yarn from the drawing side wasting short length of a weft yarn. Since the additionally length of a weft yarn is fed into an open shed by the agency of the auxiliary nozzles, the faultily picked weft yarn is separated from the cloth fell. Consequently, the leading end of the faultily picked weft yarn can be surely made to reach the faultily picked weft yarn drawing means and hence the faultily picked weft yarn can be removed with reliability. If a stretching nozzle is used as the faultily picked weft yarn extracting means, any other special device for removing the faultily picked weft yarn is not necessary, so that work for handling yarns in the vicinity of the main picking nozzle and for operating devices disposed around the main picking nozzle is facilitated. If the faultily picked weft yarn is not damaged and maintains a normal quality, the faultily picked yarn is straightened in the shed and used as a weft yarn to avoid wasting the weft yarn. The present invention is particularly effective in weaving a glass fiber fabric.

The above and other objects, features and advantages of the present invention will become more apparent from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a diagrammatic view of assistance in explaining sequential steps of a faultily picked weft yarn removing method in a first embodiment according to the present invention;
Fig. 2 is a time chart of assistance in explaining the sequential steps illustrated in Fig. 1 of the faultily picked weft yarn disposal method;
Fig. 3 is a diagrammatic view of assistance in explaining sequential steps of a faultily picked weft yarn disposal method in a second embodiment according to the present invention; and
Fig. 4 is a diagrammatic view of assistance in explaining sequential steps of a faultily picked weft yarn disposal method in a third embodiment according to the present invention;
Fig. 5 is a diagrammatic view of assistance in explaining sequential steps of a faultily picked weft yarn disposal method in a fourth embodiment according to the present invention; and
Fig. 6 is a time chart of assistance in explaining the sequential steps illustrated in Fig. 5 of the faultily picked yarn disposal method.

Fig. 1 shows the sequential steps of a faultily picked weft yarn disposal method in a first embodiment according to the present invention, in which faultily picked weft yarn removing operations and angular positions of the main shaft of a loom where the faultily picked weft yarn removing operations are to be carried out are indicated in the left end region of the drawing, the condition of a faultily picked weft yarn in a shed is indicated in the middle region of the drawing, and the positional relation between a shed, a faultily picked weft yarn in the cloth fell and a normally picked weft yarn is indicated in a right end region of the drawing. Fig. 2 shows the sequential variation of the angular position of the main shaft of the loom during the faultily picked weft yarn removing operations.

Referring to Fig. 1, a main picking nozzle 1 picks a length of a weft yarn 2 for one pick stored on a yarn measuring and storing device, not shown, into a shed 5 of warp yarns 4 every one picking cycle. If the weft yarn 2 is picked normally, a weft feeler 6 disposed on a drawing side opposite a picking side from which the weft yarn 2 is picked detects the arrival of the weft yarn 2 at a predetermined position on the drawing side. A stretching nozzle 10 sucks a leading end portion of the normally picked weft yarn 2 to tighten the weft yarn 2 properly in the shed 5.

Step 1: If a short pick occurs during the weaving operation, the weft feeler 6 is unable to detect the leading end of the weft yarn 2 and detects the mispick when the main shaft of the loom is at an angular position of about 290°.
Step 2: Upon the reception of a mispick signal from the weft feeler 6, a loom controller, not shown, makes a yarn measuring and storing device, not shown, release a predetermined length of the weft yarn 2 necessary for faultily picked weft yarn removal. For example, if five loops of the weft yarn 2 is necessary for one pick, the predetermined length of the weft yarn 2 to be unwound from the yarn storage drum of the yarn measuring and storing device corresponds to one or two loops of the weft yarn 2, five loops of the weft yarn 2 at the longest. Then, a feed nozzle 7 disposed between the main picking nozzle 1 and a selvage of the fabric on the loon, on the picking side is actuated to pull out the predetermined length of the weft yarn 2 unwound from the yarn storage drum and continuous with a faultily picked weft yarn 3 through the main picking nozzle 1 and to blow the predetermined length of the weft yarn 2 in an upward convex curve, and the main shaft of the loom is turned forward to an angular position of about 150°. Since the predetermined length of the weft yarn 2 pulled out through the main picking nozzle 1 is outside a cutting region in which the yarn cutting operation of a weft yarn cutter 8 is effective, the faultily picked weft yarn 3 remains continuous with the weft yarn 2 extending from the main picking nozzle 1. In this state, the faultily picked weft yarn 3 is beaten into the cloth fell and is meshed with the warp yarns 4.
Step 3: Then, the loom is reversed automatically and the main shaft of the loom is turned in the reverse direction to an angular position of about

180° in a faulty picking cycle in which the mispick occurred to open a shed of warp yarns 4 so that the faultily picked weft yarn 3 is released from the hold of the warp yarns 4.

Step 4: Subsequently, the loom controller stops the blowing operation of the feed nozzle 7 and makes all a plurality of auxiliary nozzles 9 jet air simultaneously. Then, the weft yarn 2 pulled out from the main picking nozzle 1 is moved toward the drawing side by currents of air jetted by the auxiliary nozzles 9. Consequently, the faultily picked weft yarn 3 blows in a U-shape, is separated from the cloth fell from a portion thereof near the picking side toward a portion thereof near the drawing side, and is moved toward an operating stretching nozzle 10. Loosening nozzles 12 may be disposed near the opposite selvages of the fabric so as to blow air toward the cloth fell to separate the faultily picked weft yarn 3 quickly from the cloth fell. The leading end portion of the faultily picked weft yarn 3 is carried toward the drawing side by the currents of air jetted by the auxiliary nozzles 9 after the faultily picked weft yarn 3 has been completely separated from the cloth fell. The arrival of the leading end, i.e., the right end as viewed in Fig. 1, of the faultily picked weft yarn 3 at the stretching nozzle 10 is detected by a sensor 13. The length of the weft yarn 2 to be fed for the removal of the faultily picked weft yarn 3 is a length enough to enable the leading end of the faultily picked weft yarn 3 to reach the stretching nozzle 10 when the faultily picked weft yarn 3 is separated entirely from the cloth fell. Mispicks include a short pick resulting from feed of a length of the weft yarn 2 from the yarn storage drum of the yarn measuring and storing device shorter than a length of the weft yarn 2 necessary for one pick, a bent pick resulting from the bend of a leading end portion of the picked weft yarn 2, and a broken pick resulting from the breakage of the picked weft yarn 2. A predetermined length of the weft yarn 2 necessary to enable the leading end of the faultily picked weft yarn 3 of each of the foregoing types of mispick to reach the stretching nozzle 10 is determined empirically.

Step 5: Subsequently, the stretching nozzle 10 functions as a faultily picked weft yarn extracting means 11, and a leading end portion of the faultily picked weft yarn 3 is sucked into the stretching nozzle 10. In this state, the faultily picked weft yarn 3 is taut between the main picking nozzle 1 and the stretching nozzle 10, and the operation of all the auxiliary nozzles 9 is stopped. The auxiliary nozzles 9 may be divided into groups and the groups may be actuated in a sequential actuation mode in which the groups are actuated sequentially from the group nearest to the picking side toward the group nearest to the drawing side instead of simultaneously actuating all the auxiliary nozzles 9 in separating the faultily picked weft yarn 3 from the cloth fell.

Step 6: Then, the main shaft of the loom is turned forward to an angular position of, for example, about 60° for the next picking cycle to cut the weft yarn 2 continuous with the faultily picked weft yarn 3 by the weft yarn cutter 8. Since the faultily picked weft yarn 3 and the weft yarn 2 continuous with the faultily picked weft yarn 3 are held by the warp yarns 4, the faultily picked weft yarn 3 and the waft yarn 2 are not sucked into the stretching nozzle 10 by the suction of the stretching nozzle 10.

Step 7: Subsequently, the main shaft of the loom reverses automatically to an angular position of about 180° of the faulty picking cycle, the faultily picked weft yarn 3 and the weft yarn 2 continuous with the faultily picked weft yarn 3 are released from the warp yarns and are sucked into the stretching nozzle 10 by the suction of the stretching nozzle 10. Thus, the faultily picked weft yarn 3 is pulled from the drawing side by the stretching nozzle 10 and is extracted from the fabric. The completion of removal of the faultily picked weft yarn 3 can be confirmed by the detection of absence of the faultily picked weft yarn 3 and the weft yarn 2 continuous with the faultily picked weft yarn 3 by the sensor 13. If the weft yarn 2 is cut manually with a cutter by an operator or automatically by a cutting device controlled by the loom controller at a position near the main picking nozzle 1 while the leading end portion of the faultily picked weft yarn 3 is being pulled by the stretching nozzle 10 in Step 5, the faultily picked weft yarn 3 is sucked into the stretching nozzle 10 and, therefore, the operations in steps 6 and 7 for turning the main shaft of the loom forward, cutting the weft yarn 2 continuous with the faultily picked weft yarn 3, and extracting the faultily picked weft yarn 3 can be omitted.

Step 8: Subsequently, the main shaft of the loom is reversed to an angular position of 320° in a picking cycle preceding the faulty picking cycle in which the mispick occurred, and then the loom is restarted.

Although the auxiliary nozzles 9 are actuated to separate the faultily picked weft yarn 3 from the cloth fell after reversing the main shaft of the loom to an angular position of about 180° in the faulty picking cycle in the foregoing embodiment, the auxiliary nozzles 9 may be actuated when the faultily picked weft yarn 3 is released from the warp yarns 4 during the reverse rotation of the main shaft toward the angular position of about 180°. The stretching nozzle 10 is in operation during this reverse rotation of the main shaft of the loom. It is desirable to adjust the timing of the air jetting operation of the auxiliary nozzles 9 so that the leading end portion of the faultily picked weft yarn 3 is moved excessively rapidly toward the stretching nozzle 10 and the leading end portion of the faultily picked weft yarn 3 is sucked in a

bent state into the stretching nozzle 10 when separating the faultily picked weft yarn 3 from the cloth fell and stretching the faultily picked weft yarn 3 in a straight line by the agency of air jetted by the auxiliary nozzles 9.

The faultily picked weft yarn disposal method will be described with reference to Fig. 1 on an assumption that the auxiliary nozzles 5 of the loom are divided into five auxiliary nozzle groups each of the two auxiliary nozzles 9.

All the auxiliary nozzles 9 of the first to the fifth auxiliary nozzle group are actuated simultaneously to blow the weft yarn 2 floating as shown in 3) of Fig. 1 is blown into a shed 5 of the warp yarns 4. Consequently, a section of the faultily picked weft yarn 3 is separated from the cloth fell as shown in 4) of Fig. 1 and is exposed to air jets jetted by the auxiliary nozzles 9 of the first auxiliary nozzle group, i.e., the leftmost auxiliary nozzle group. Then, the faultily picked weft yarn 3 is blown gradually toward the drawing side as indicated by broken lines in 4) of Fig. 1 by air jets jetted by the second to the fifth auxiliary nozzle group which are actuated sequentially in that order. Air jetting periods of the second to the fifth auxiliary nozzle group are determined so that valves connected to the second to the fifth auxiliary nozzle group are closed immediately before the time when the faultily picked weft yarn 3 separated from the cloth fell is to be moved toward the drawing side to blow the faultily picked weft yarn 3 toward the drawing side by air jetted by a residual pressure remaining in pipes connected to the second to the fifth auxiliary nozzle group. More specifically, if the loom is of a 150 cm in weaving width and is provided with four auxiliary nozzle groups, the air jetting periods of the first to the fourth auxiliary nozzle group are 20 ms, 10 ms, 20 ms and 30 ms, respectively. If the air jetting periods are thus determined, the faultily picked weft yarn 3 can be moved at an appropriate speed, which is effective in weaving a glass fiber fabric.

Steps of a faultily picked weft yarn disposal method in a second embodiment according to the present invention are illustrated in Fig. 3. This method inserts a necessary length of the weft yarn 2 into a shed of the warp yarns 4 by the main picking nozzle 1 while the main shaft of the loom is being turned in the reverse direction in a step shown in 3) of Fig. 3 to feed an additional length of the weft yarn 2. Steps other than that shown in 3) of Fig. 3 are the same as those of the method in the first embodiment previously described with reference to Fig. 1. In this embodiment, the feed nozzle 7 is not actuated. Therefore, the weft yarn 2 is moved into the cutting region of the weft yarn cutter 8 as the slay moves forward by inertia for beating. Therefore, the operation of the weft yarn cutter 8 is controlled so that the weft yarn cutter 8 will not function while the weft yarn 2 is in the cutting region of the weft yarn cutter 8. Thus, the faultily picked weft yarn 3 remains continuous with the weft yarn 2 extending from the main picking nozzle 1.

Steps of a faultily picked weft yarn disposal method in a third embodiment according to the present invention are illustrated in Fig. 4. In this method, the feed nozzle 7 is actuated while the loom is stopped in a step shown in 2) of Fig. 4 to pull out a necessary length of the weft yarn 2 from the main picking nozzle 1, and the necessary length of the weft yarn 2 is blown into a shed 5 by jetting air by the main picking nozzle 1 in a step shown in 3) of Fig. 4 for reversing the loom to feed the necessary length of the weft yarn 2 into the shed 5. Since the feed nozzle blows the weft yarn 2 in an upward convex curve out of the cutting region of the weft yarn cutter 8, the weft yarn 2 is not cut at a position on the picking side even if the weft yarn cutter 8 operates. Other steps of this method are the same as those of the method previously described with reference to Fig. 1.

The leading end of the faultily picked weft yarn 3 may be made to reach the faultily picked weft yarn extracting means 11 by feeding the necessary length of the weft yarn 2 after stretching the faultily picked weft yarn 3 by the agency of the auxiliary nozzles 9, which is particularly effective in weaving a glass fiber fabric.

In the method previously described with reference to Fig. 1, the necessary length of the weft yarn 2 can be blown toward the drawing side by the currents of air jetted by the auxiliary nozzle 9 and the leading end portion of the faultily picked weft yarn 3 can be sucked into the stretching nozzle 10 without being bent if a resistance against the movement of the necessary length of the weft yarn 2 toward the drawing side is applied to the necessary length of the weft yarn 2 so that the necessary length of the weft yarn 2 cannot be easily inserted into the shed 5 when stretching the faultily picked weft yarn 3 by jetting air by the auxiliary nozzles 9 and the resistance is removed from the necessary length of the weft yarn 2 after the faultily picked weft yarn 3 has been entirely separated from the cloth fell and stretched in a straight line.

A frictional resistance can be applied to the weft yarn 2 by disposing a curved yarn guide having a cylindrical surface opposite to the feed nozzle 7 with respect to the weft yarn 2 and blowing air by the feed nozzle 7 against the weft yarn 2 so that the weft yarn 2 is pressed against the cylindrical surface of the yarn guide. In the method in the second embodiment illustrated in Fig. 3, which does not blow the necessary length of the weft yarn 2 in an upward convex curve, keeps the weft yarn cutter 8 inoperative and keeps the faultily picked weft yarn 3 continuous with the weft yarn 2 extending from the main picking nozzle 1, the necessary length of the weft yarn 2 may be unwound from the yarn storage drum of the yarn measuring and storing device by disengaging a yarn holding pin from the yarn storage drum after the faultily picked weft yarn 3 has been stretched in a straight line.

The faultily picked weft yarn extracting means 11 may be the stretching nozzle 10 which uses air currents

for pulling the faultily picked weft yarn 3 or a pair of rollers which nips the faultily picked weft yarn 3 therebetween and rotate to take up the faultily picked weft yarn 3. More specifically, a pair of rollers are disposed so as to be able to be separated from each other instead of the stretching nozzle 10, the pair of rollers are separated from each other in the step shown in 4) of Fig. 1, and the leading end portion of the faultily picked weft yarn 3 reaches a position between the pair of rollers. The pair of rollers are rotated after the weft yarn 2 has been cut and the faultily picked weft yarn 3 has been caught between the pair of rollers to extract the faultily picked weft yarn 3 from the shed 5. If a suction nozzle is disposed behind the pair of rollers with respect to a picking direction and the suction nozzle is operated while the faultily picked weft yarn 3 is being stretched in a straight line, the leading end portion of the faultily picked weft yarn 3 can be made easily to reach the position between the pair of rollers. The faultily picked weft yarn extracting means 11 may be any suitable well-known extracting means other than the pair of rollers.

Steps of a faultily picked weft yarn disposal method in a fourth embodiment according to the present invention are illustrated in Figs. 5 and 6. This method does not remove a mispicked yarn 3 and uses the same as a normal weft yarn. Step 1 for detecting a short pick, step 2 for stopping the loom, step 3 for reversing the loom, step 4 for jetting a fluid through the auxiliary picking nozzles and step 5 for sucking the faultily picked yarn are the same as those illustrated in Fig. 1.

The faultily picked weft yarn 3 is straightened in the shed 5 by suction. The stretching nozzle 10 serves as a drawing device 14 for holding the faultily picked weft yarn 3 transferred thereto straight in the shed 5. In step 6, the main shaft of the loom is reversed to an angular position of about 50° in the faulty picking cycle. Then, the loom is restarted with the faultily picked weft yarn 3 held taut at a predetermined tension by the drawing device 14. After the loom has been started, the faultily picked weft yarn 3 is held by a catch cord 15 disposed on the drawing side of the loom. In a short time, the faultily picked weft yarn 3 is cut at a position between the catch cord 15 and the drawing device 14 by a cutter 16, and a cut portion of the faultily picked weft yarn 3 is delivered outside by the drawing device 14. The faultily picked weft yarn 3 continuous with the weft yarn 2 is cut at a position between the selvedge on the drawing side and the catch cord 15 by a cutter 17. If most part of the faultily picked weft yarn 3 is damaged by air blown by the feed nozzle 7 and is incapable of being used as a normal weft yarn 2, the damaged faultily picked weft yarn 3 is removed entirely by feeding a length of the weft yarn 2 necessary for one pick from the feed side. The drawing device 14 need not necessarily be the stretching nozzle 10, but may be a suction device using a blower or a take-up roller device.

The features disclosed in the foregoing description, in the claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A faultily picked weft yarn disposal method comprising steps of:

   stopping a loom with a faultily picked weft yarn (3) kept continuous with a weft yarn (2) extending from a main picking nozzle (1) upon the occurrence of a mispick;
   opening the cloth fell of a fabric on the loom so that the faultily picked weft yarn (3) is released from the cloth fell;
   feeding a length of the weft (2) necessary for making the leading end of the faultily picked weft yarn (3) reach a faultily picked weft yarn extracting means (11) disposed on a drawing side opposite a picking side from which a weft yarn (2) is picked into a shed (5) prior to the extraction of the faultily picked yarn;
   making a plurality of auxiliary picking nozzles (9) arranged along a path of the picked weft yarn (2) jet a fluid to separate the faultily picked weft yarn (3) in a U-shape from the cloth fell and to make the leading end of the faultily picked weft yarn (3) reach the faultily picked weft yarn extracting means (11); and
   drawing the faultily picked weft yarn (3) by the faultily picked weft yarn extracting means (11) to remove the faultily picked weft yarn (3) from the shed (5).

2. The faultily picked weft yarn disposal method according to claim 1, wherein the length of the weft yarn (2) necessary for making the leading end of the faultily picked weft yarn (3) reach the faultily picked weft yarn extracting means (11) is fed by making a feed nozzle (7) disposed near the main picking nozzle (1) jet a fluid to pull out the weft yarn (2) extending within the main picking nozzle (1).

3. The faultily picked weft yarn disposal method according to claim 1, wherein the length of the weft yarn (2) necessary for making the leading end of the faultily picked weft yarn (3) reach the faultily picked weft yarn extracting means (11) is fed by making the main picking nozzle jet a fluid to pull out the weft yarn (2) extending within the main picking nozzle (1).

4. The faultily picked weft yarn disposal method according to claim 1, wherein the length of the weft yarn (2) necessary for making the leading end of the faultily picked weft yarn (3) reach the faultily picked weft yarn extracting means (11) is fed by

making a feed nozzle (7) disposed near the main picking nozzle (1) jet a fluid to pull out the weft yarn (2) extending within the main picking nozzle (1) and making the main picking nozzle (1) jet a fluid to insert the weft yarn (2) thus pulled out through the main picking nozzle (1) into a shed (5).

5. The faultily picked weft yarn disposal method according to claim 1, wherein the faultily picked weft yarn extracting means is a stretching nozzle (10) disposed on the drawing side to stretch the picked weft yarn (2).

6. A faultily picked weft yarn disposal method comprising steps of:

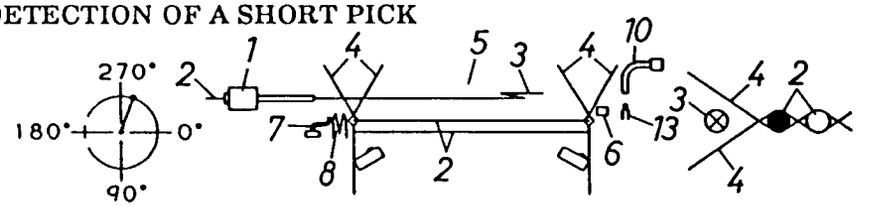
stopping a loom with a faultily picked weft yarn (3) kept connected to a weft yarn (2) extended in a main picking nozzle (1) upon the occurrence of a mispick;
opening the cloth fell of a fabric on the loom so that the faultily picked weft yarn (3) is released from the cloth fell;
jetting a fluid by a plurality of auxiliary nozzles (9) arranged along a path of a picked weft yarn (2) to separate the faultily picked weft yarn (3) from the cloth fell;
feeding a length of the weft yarn (2) necessary for making the leading end of the faultily picked weft yarn (3) reach a faultily picked weft yarn extracting means (11) disposed on a drawing side opposite a picking side from which the weft yarn (2) is picked into a shed (5) so that the leading end of the faultily picked weft yarn (3) reaches the faultily picked weft yarn extracting means (11); and
drawing the faultily picked weft yarn (3) by the faultily picked weft yarn extracting means (11) to remove the faultily picked weft yarn (3) from the cloth fell.

7. A faultily picked yarn disposal method comprising steps of:

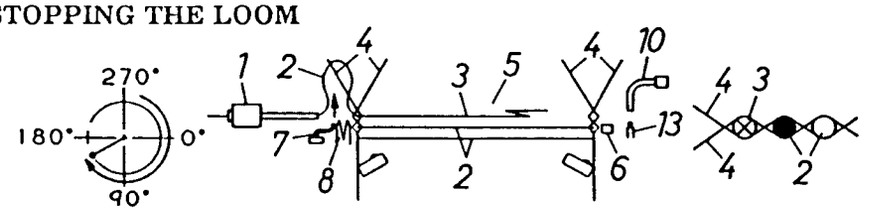
stopping a loom with a faultily picked yarn (3) kept continuous with a weft yarn (2) extending from a main picking nozzle (1) upon the occurrence of a mispick;
opening the cloth fell of a fabric on the loom so that the faultily picked yarn (3) is released from the cloth fell;
feeding a length of the weft (2) necessary for making the leading end of the faultily picked yarn (3) reach a faultily picked yarn drawing means (14) disposed on a drawing side opposite a picking side from which a weft yarn (2) is picked into a shed (5);
making a plurality of auxiliary picking nozzles (9) arranged along a path of the picked weft yarn (2) jet a fluid to separate the faultily picked yarn (3) in a U-shape from the cloth fell and to transfer the leading end of the faultily picked yarn (3) to a faultily picked yarn drawing means;
drawing the faultily picked yarn by the faultily picked yarn drawing means to straighten the faultily picked yarn in the shed; and
restarting the loom

FIG.1

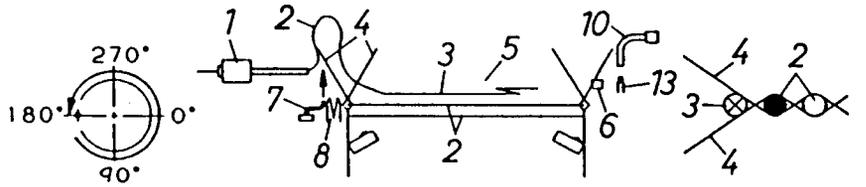
1) DETECTION OF A SHORT PICK



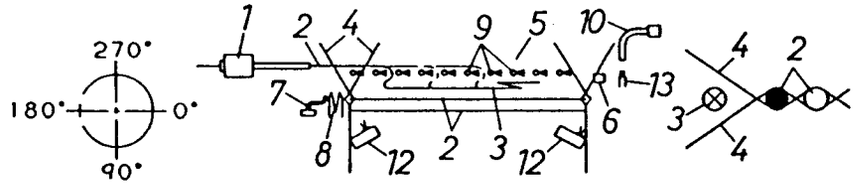
2) STOPPING THE LOOM



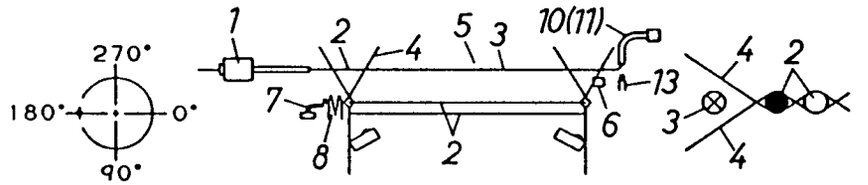
3) REVERSING THE LOOM



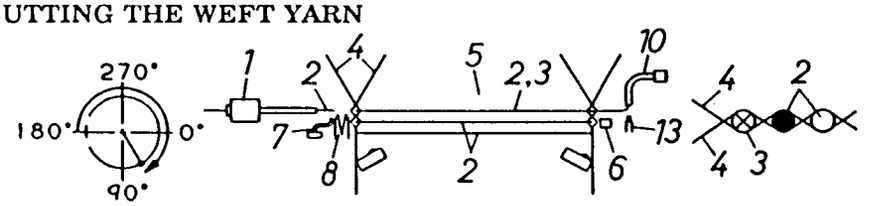
4) SIMULTANEOUS ACTUATION OF THE AUXILIARY NOZZLES



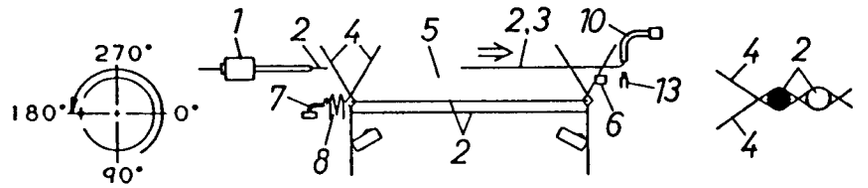
5) SUCTION OF THE FAULTILY PICKED WEFT YARN



6) CUTTING THE WEFT YARN



7) EXTRACTION OF THE FAULTILY PICKED WEFT YARN



8) RESTARTING THE LOOM

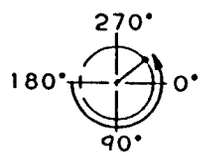
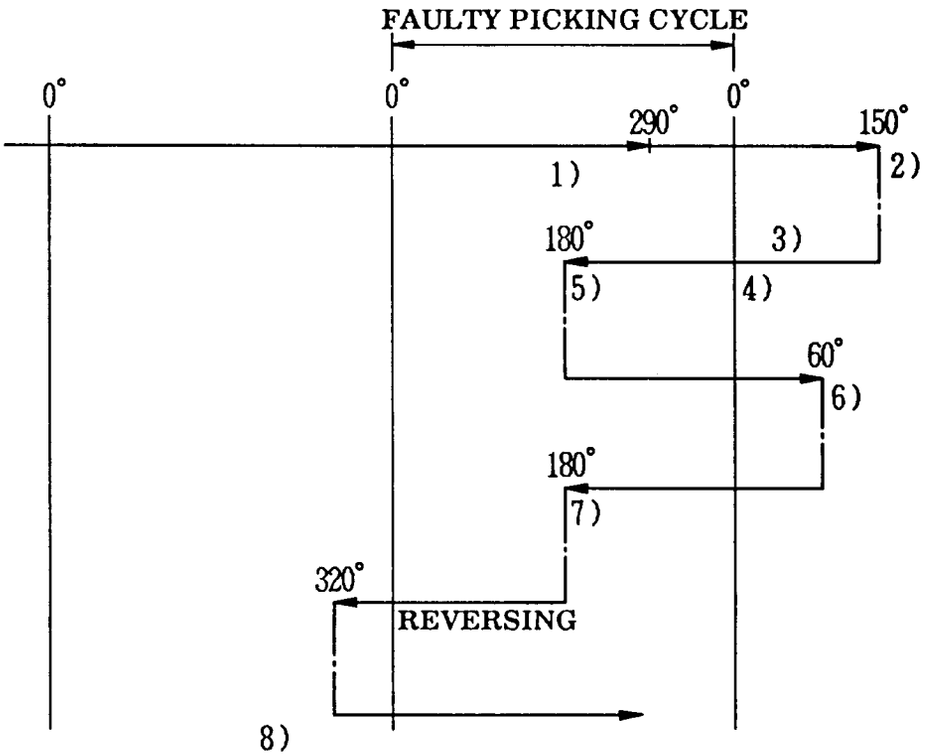


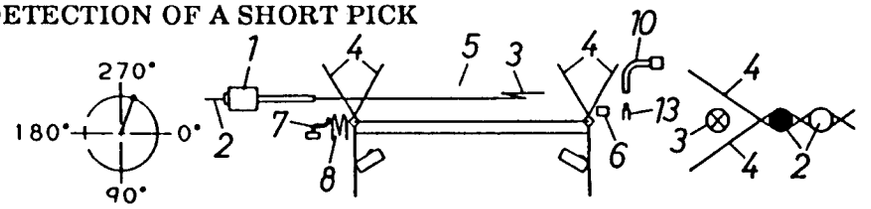
FIG.2



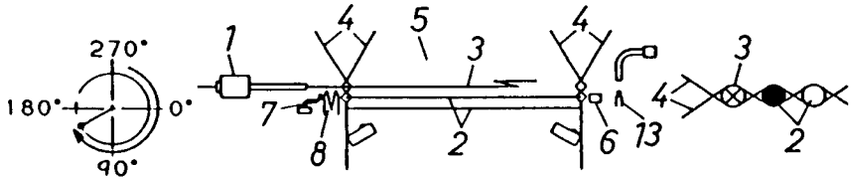
1) DETECTION OF A MISPICK
2) STOPPING THE LOOM
3) REVERSING THE LOOM
4) SIMULTANEOUS ACTUATION OF THE AUXILIARY NOZZLES
5) SUCTION OF THE FAULTILY PICKED WEFT YARN
6) CUTTING THE WEFT YARN
7) COMPLETION OF EXTRACTION OF THE FAULTILY PICKED WEFT YARN
8) RESTARTING THE LOOM

FIG.3

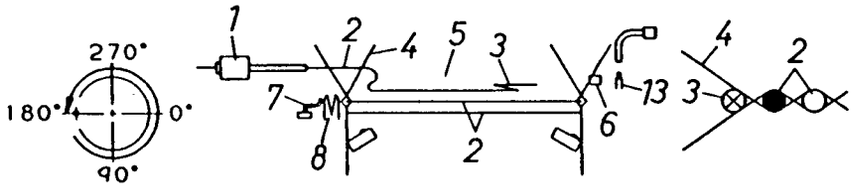
1) DETECTION OF A SHORT PICK



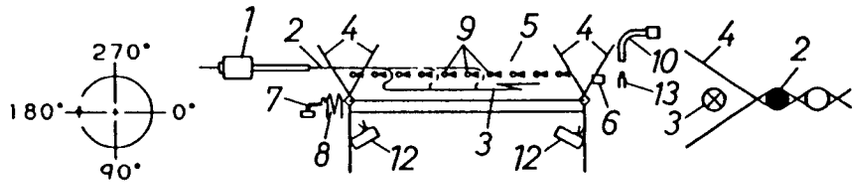
2) STOPPING THE LOOM



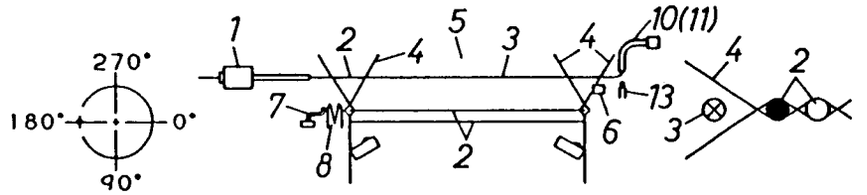
3) FEEDING THE WEFT YARN DURING REVERSING



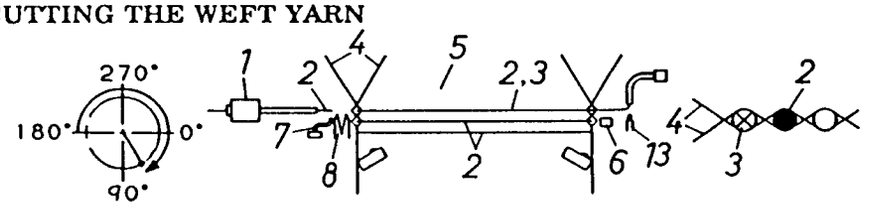
4) SIMULTANEOUS ACTUATION OF THE AUXILIARY NOZZLES



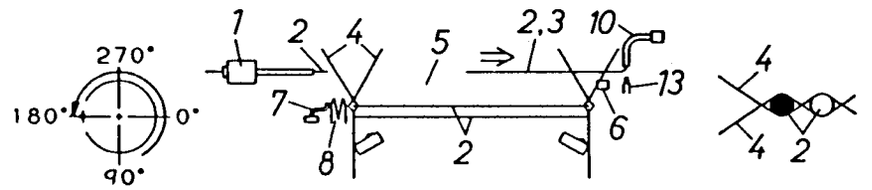
5) SUCTION OF THE FAULTILY PICKED WEFT YARN



6) CUTTING THE WEFT YARN



7) EXTRACTION OF THE FAULTILY PICKED WEFT YARN



8) RESTARTING THE LOOM

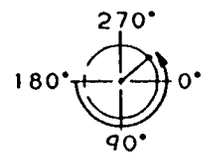
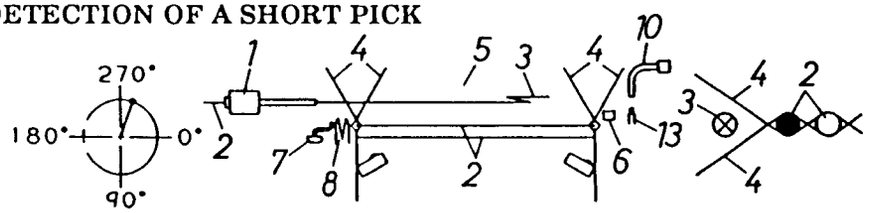
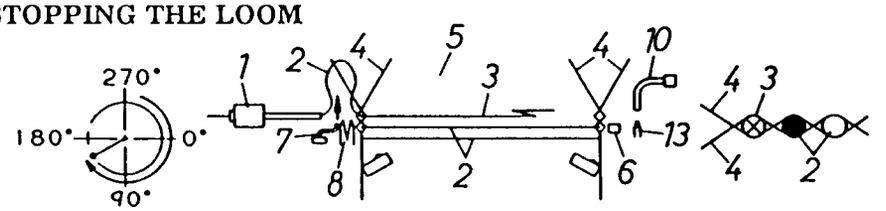


FIG.4

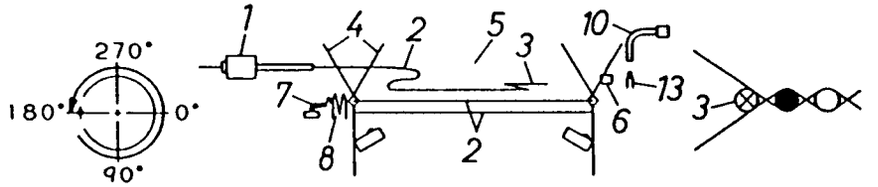
1) DETECTION OF A SHORT PICK



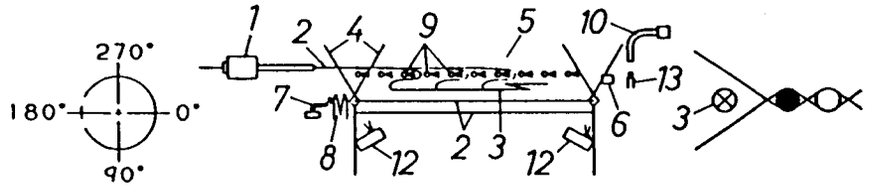
2) STOPPING THE LOOM



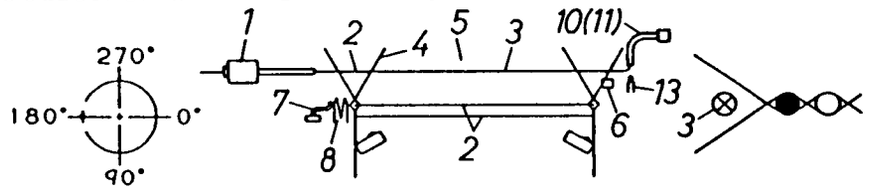
3) FEEDING THE WEFT YARN DURING REVERSING



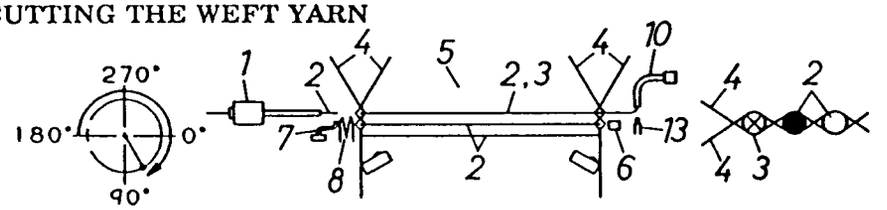
4) SIMULTANEOUS ACTUATION OF THE AUXILIARY NOZZLES



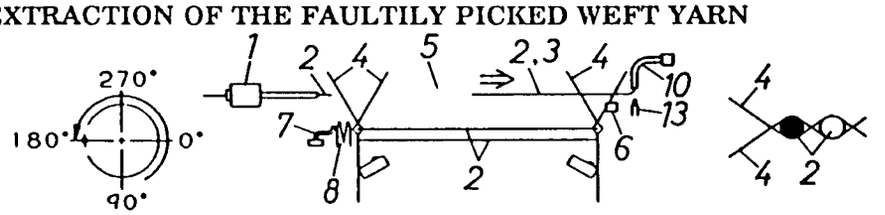
5) SUCTION OF THE FAULTILY PICKED WEFT YARN



6) CUTTING THE WEFT YARN



7) EXTRACTION OF THE FAULTILY PICKED WEFT YARN



8) RESTARTING THE LOOM

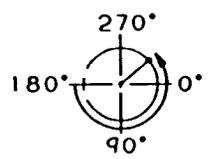
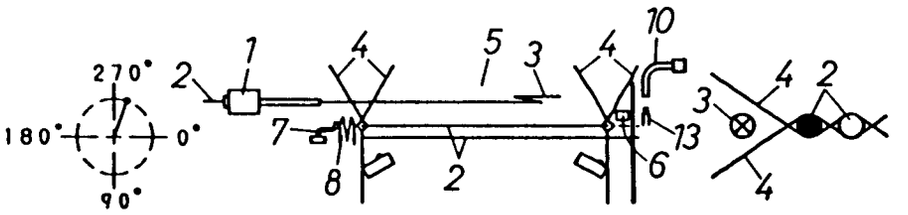
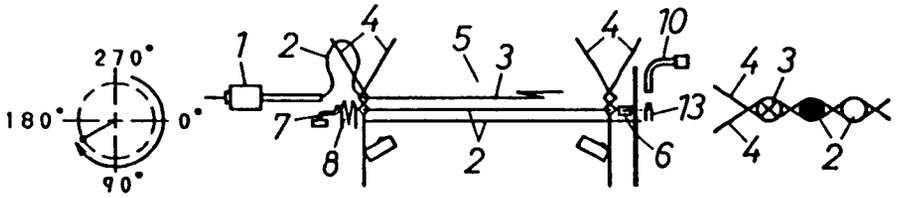


FIG.5

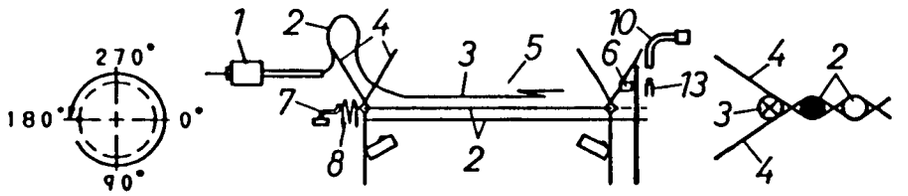
1) DETECTION OF A SHORT PICK



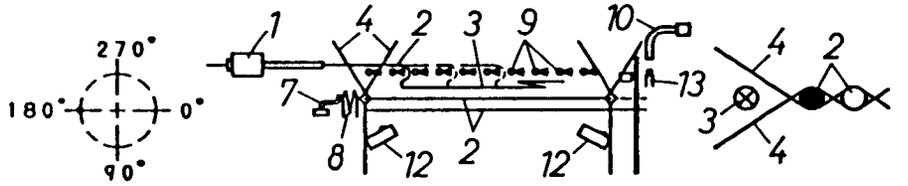
2) STOPPING THE LOOM



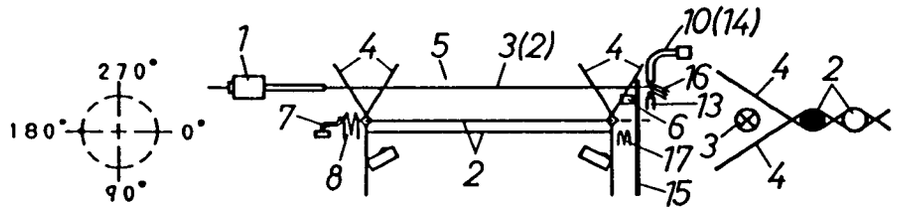
3) REVERSING THE LOOM



4) SIMULTANEOUS ACTUATION OF THE AUXILIARY NOZZLES



5) SUCTION OF THE FAULTILY PICKED WEFT YARN



6) RESTARTING THE LOOM

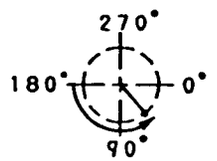
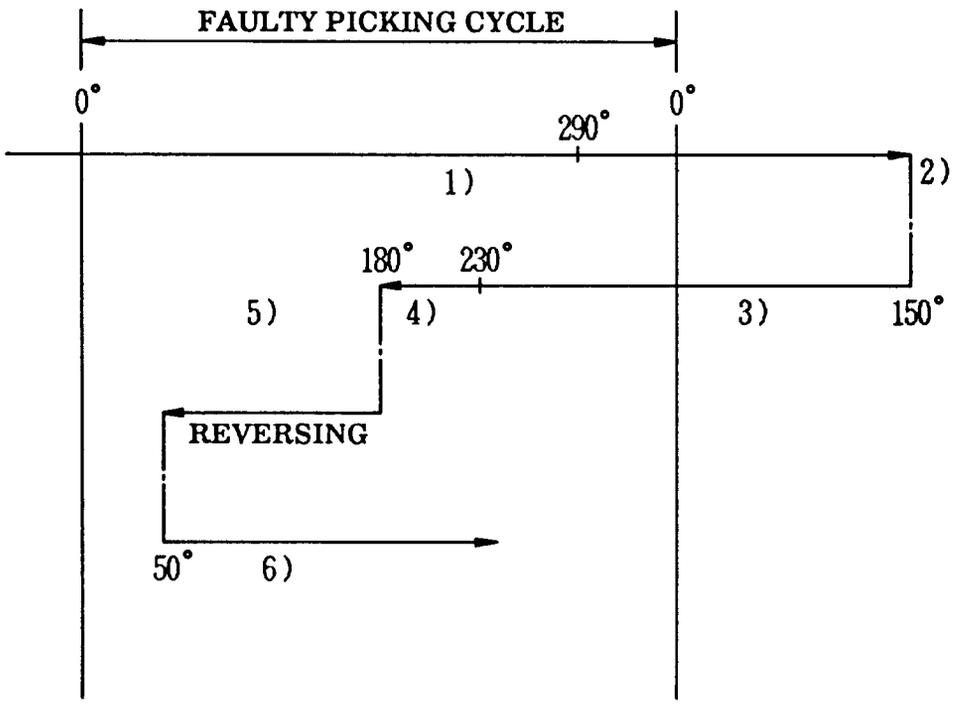


FIG.6



1) DETECTION OF A MISPICK
2) STOPPING THE LOOM
3) REVERSING THE LOOM
4) SIMULTANEOUS ACTUATION OF THE AUXILIARY NOZZLES
5) SUCTION OF THE FAULTILY PICKED WEFT YARN
6) RESTARTING THE LOOM

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 10 1073

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	EP 0 322 576 A (ZVS VYZKUMNEVYVOJOVY USTAV KONCERNOVA UCELOVA ORGANIZACE) 5 July 1989 * the whole document *	1-5 6,7	D03D51/00
X A	EP 0 534 541 A (SOMET) 31 March 1993 * column 5, line 33 - column 7, line 7; figures 1-8 *	1-5 6	
A	NL 8 602 191 A (PICANOL) 16 March 1988 * page 3, line 13 - page 5, line 10; figures 1-5 *	1,3,5-7	
A,D A	JP 61 245 339 A (TSUDAKOMA) 31 October 1986 & EP 0 200 168 A (TSUDAKOMA)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) D03D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 June 1998	Boutelegier, C

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