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(54) **Pile orientation device for pile fabric loom**

guide member is movable reciprocally in the front-and-rear direction of the pile fabric loom by the terry motion and guides the woven cloth toward the winding side of the pile fabric loom. The pile orientation member is used for pressing the woven cloth on the cloth guide member. The pile orientation member is mounted on the pile fabric loom without being moved in the front-and-rear direction of the pile fabric loom by the terry motion.

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a pile orientation device for a pile fabric loom for forming piles by shifting the position of the cloth fell.

[0002] Piles formed in a woven cloth woven by a pile fabric loom are directed in random directions, and the woven cloth having such piles is regarded as a low quality woven cloth. There have been proposed various types of pile orientation device for forming piles oriented in one direction.

[0003] Japanese Utility Model Application Publication No. 64-51680 discloses a pile fabric loom in which piles are formed in a woven cloth by the terry motion which shifts the position of cloth fell. According to the Publication, the woven fabric is pressed to be curved by a bar-shaped pile orientation member so that the piles oriented in one direction. The piles of the woven cloth pressed by the pile orientation member are laid down in the direction opposite to the moving direction of the woven cloth so as to be oriented in one direction by the tension of the woven cloth or both of the urging force of the pile orientation member and the tension of the woven cloth. The above Publication No. 64-51680 shows two examples of arrangement of the pile orientation member. In one example, the pile orientation member is disposed in the path of woven cloth between the cross guide used for guiding woven cloth toward the winding side of the loom and the winding roll. In the other example, the pile orientation member is disposed in the path of woven cloth between the cross guide and the cloth fell.

[0004] Japanese Patent Application Publication No. 10-273854 discloses a pile fabric loom in which piles are formed by the terry motion which shifts the cloth fell of woven cloth. In this pile fabric loom, a pile orientation bar is disposed in the path of woven cloth between a cloth guide member guiding the woven cloth toward the winding side of the pile fabric loom and the cloth fell as in the case of the second example in the above-cited Publication No. 64-51680. The pile orientation bar is supported by a leaf spring, and the woven cloth is pressed to be bent by the urging force of the leaf spring. Thus, the piles of the woven cloth is laid down in the direction opposite to the moving direction of woven cloth by both of the urging force of the pile orientation bar and the tension of the woven cloth so that the piles are oriented in one direction.

[0005] The Japanese Examined Utility Model Publication No. 13-6878 discloses a pile orientation device of a pile fabric loom in which piles are formed in a woven cloth by the terry motion which shifts the beating position. The device according to the above Publication No. 13-6878 has a plurality of cords, such as cotton cords, which are arranged obliquely at a predetermined spaced interval on a semicircular-shaped recess formed in the longitudinal direction of the presser plate. The cords on the

presser plate are in contact with woven cloth being guided to the winding roll which is located between a breast beam and a woven cloth winding roll having needles, and the piles of the woven cloth are obliquely laid down by the cords of the presser plate.

[0006] The pile orientation devices according to the above Publications No. 64-51680 and No. 10-273854 have the same structure in which the piles are laid down by making use of the tension created by bending the woven cloth. However, the pile orientation device cannot apply sufficient pressing force against the piles because the woven cloth is bent. Thus, the piles return easily to their original state before they are laid down. When the pile fabric loom is driven in reverse direction for repairing mispicking of weft or yarn breakage, the woven cloth bent by the pile orientation member or bar is moved in reverse direction. As a result, the piles are raised easily. Additionally, the woven cloth moved in reverse direction interferes with the pile orientation member or the pile orientation bar, with the result that a defect such as friction mark occurs easily. According to the pile orientation devices disclosed in the above Publications No. 64-51680 and 10-273854, therefore, the piles cannot be oriented in the desired direction with stability.

[0007] When the pile orientation member is disposed in the path of woven cloth between the cloth fell and the cross guide or the cloth guide member as in the case of the above Publications No. 64-51680 and 10-273854, the piles which are not laid down sufficiently are tend to be raised when the woven cloth is moved around the cross guide or the cloth guide member. Therefore, the woven cloth is wound up with the piles oriented in random directions. When the pile orientation member is disposed in the woven path between the cross guide and the woven cloth winding roll, the woven cloth may be wounded up as it is with the piles oriented substantially in one direction. However, the pile orientation device disposed in the path between the cross guide and the winding roll hampers the setting-up procedure of the loom, so that the working efficiency in changing the woven cloth winding roll is decreased.

[0008] The pile orientation device of the above Publication No. 13-8878 having cords arranged obliquely on the presser plate in contact with the woven cloth on the woven cloth winding roll having needles does not bend the woven cloth. According to this pile orientation device, however, the pressing force against the piles are hardly generated because of the flexibility of the cords and the shiftability of the presser plate in the space of the recess, the woven cloth may not be formed with stable piles oriented in one direction. The pile orientation device disclosed in the above Publication No. 13-6878 which is disposed between the breast beam and the woven cloth winding roll is disadvantageous in workability when changing the woven cloth winding roll.

[0009] The present invention is directed to providing a pile orientation device which is operable to orient the piles of woven cloth with stability.

SUMMARY OF THE INVENTION

[0010] In accordance with the present invention, a pile orientation device for pile fabric loom includes a cloth guide member and a pile orientation member. The pile fabric loom for producing a woven cloth has a terry motion. The woven cloth is moved reciprocally in the front-and-rear direction of the pile fabric loom to shift a cloth fell position by the terry motion and piles are formed in the woven cloth by the terry motion. The cloth guide member is movable reciprocally in the front-and-rear direction of the pile fabric loom by the terry motion and guides the woven cloth toward the winding side of the pile fabric loom. The pile orientation member is used for pressing the woven cloth on the cloth guide member. The pile orientation member is mounted on the pile fabric loom without being moved in the front-and-rear direction of the pile fabric loom by the terry motion.

[0011] Other aspects and advantages of the invention will become apparent from the following description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The invention together with objects and advantages thereof, may best be understood by reference to the following description of the presently preferred embodiments together with the accompanying drawings in which:

Fig. 1 is a side view of a pile orientation device of a pile fabric loom according to a first preferred embodiment of the present invention, showing the operation of the device during fast picking;

Fig. 2 is a side view showing the operation of the pile orientation device of Fig. 1 during loose picking;

Fig. 3 is an exploded perspective view showing the pile orientation device of Fig. 1;

Fig. 4 is a side view showing a pile orientation device for a pile fabric loom according to a second preferred embodiment of the present invention showing the operation of the device during fast picking;

Fig. 5A is a partially enlarged side view showing a pile orientation device according to another embodiment of the present invention; and

Fig. 5B is a partially enlarged perspective side view showing a pile orientation device according to yet another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] The following will describe a pile orientation device for a pile fabric loom according to a first preferred embodiment of the present invention with reference to Figs. 1 through 3. It is noted that the left and right sides of Fig. 1 correspond to the front and rear sides of the pile fabric loom. Referring to Fig. 1, the pile fabric loom includes a pile orientation device 11. The pile orientation device 11 has a cloth guide member 1 and a rocking member 2 fixedly mounted on a shaft 3. The cloth guide member 1 is formed in a cylindrical shape and fixed to the top end of the rocking member 2 and is driven to rock on the shaft 3 in reciprocal back-and-forth direction of arrow A1 by the terry motion (not shown). The rocking member 2 has a projection 4 extending therefrom and having a connecting pin 5 inserted through a hole in the projection 4. The connecting pin 5 moves a fell plate 7 and a temple device (not shown) together in the front-and-rear direction of the pile fabric loom through a link 6. Thus, a woven cloth W extending between the cloth guide member 1 and a cloth fell W1 is moved reciprocally in the front-and-rear direction of arrow A2 by the rocking motion of the cloth guide member 1, so that the position of the cloth fell W1 is moved reciprocally in the front-and-rear direction of the pile fabric loom.

[0014] Fig. 1 shows the pile fabric loom during fast picking when the cloth guide member 1 is moved to the rear position thereof and the cloth fell W1 coincides with the beating position of a reed 8 of the pile fabric loom. Fig. 2 shows the pile fabric loom during loose picking when the cloth guide member 1 is moved to the front position thereof and the cloth fell W1 is spaced from the beating position of the reed 8 at a predetermined distance. During the operation of the pile fabric loom, loose picking is performed by shedding operation of warp yarns Y and weft insertion in the state of Fig. 2, and fast picking is performed by shedding operation of warp yarns Y and weft insertion in the state of Fig. 1. The woven cloth W having piles formed by fast picking is guided toward the winding side of the pile fabric loom by the cloth guide member 1, then moved around a surface roller 9 and a guide roller 10 and wound around a winding roller (not shown).

[0015] A bracket 12 is mounted to a frame (not shown) of the pile fabric loom at a position above the cloth guide member 1. A cylindrical supporting member 13 extending in the direction of weaving width of the pile fabric loom is fixedly mounted at the opposite ends thereof to the bracket 12 by a bolt 15 through a press plate 14. Specifically, the supporting member 13 has elongated holes 13A, 13B formed therethrough on the front and rear sides of the pile fabric loom, and the bolt 15 is passed through the elongated holes 13A, 13B for fixing the supporting member 13 to the bracket 12.

[0016] The following will describe the pile orientation device 11 with reference to Fig. 3. A plurality of leaf springs 16 each having a curved shape is disposed at

predetermined spaced intervals in the weaving width direction. Each leaf spring 16 is fixed at one end thereof to the supporting member 13 by a screw 17 and at the other end thereof to a plate-shaped pile orientation member 1\$ extending along the weaving width by a screw 19. The pile orientation member 1\$ is arranged so as to press the woven cloth W on the peripheral surface of the cloth guide member 1 through by the urging force of the leaf spring 16 and mounted on the pile fabric loom without being moved in the front-and-rear direction of the pile fabric loom by the terry motion of the cloth guide member 1. Loosening the bolts 15, the supporting member 13 may be rotated by virtue of the elongated holes 13A, 13B. In other words, the supporting member 13 is rotatable in the circumferential direction of the cylindrical supporting member 13 when the bolt 15 is loosened. By rotating the supporting member 13 clockwise in Fig. 1, the pile orientation member 1\$ is released from engagement with the cloth guide member 1. Thus, setting-up or repairing operations such as drawing-in of woven cloth or connection of warp yarns may be performed with improved workability.

[0017] The pile orientation member 18 having a contact surface 20 is arranged such that the contact surface 20 is parallel to a line that is the tangential to the cloth guide member 1 at the contact point thereof during fast picking so that the contact surface 20 is disposed along the rocking direction of the rocking member 2 or the moving direction of the cloth guide member 1. The contact surface 20 is formed with a length that covers the whole longitudinal moving range L of the cloth guide member 1, as shown in Fig. 2, so as to be constantly pressed against the cloth guide member 1. The peripheral surface of the cloth guide member 1 for guiding the woven cloth W is formed with a curved surface, while the contact surface 20 of the pile orientation member 18 is formed with a planar surface, so that a wedge-shaped space 21 is formed between the cloth guide member 1 and the pile orientation member 18 on the upstream side thereof with respect to the moving direction of the woven cloth W or on the advancing side of the woven cloth W during the normal rotation of the pile fabric loom. A similar wedge-shaped space 22 is also formed on the downstream side thereof with respect to the moving direction of the woven cloth W or on the winding side of the pile fabric loom. Thus, the wedge-shaped spaces 21, 22 are formed on the upstream side and downstream side of the woven cloth W in relation to the cloth guide member 1 and the pile orientation member 18. These spaces 21, 22 help the woven cloth W to smoothly enter into and leave from the orientation area between the cloth guide member 1 and the pile orientation member 18.

[0018] The following will describe the operation and advantageous effects of the pile orientation device in the pile fabric loom according to the first preferred embodiment of the present invention. During operation of the pile fabric loom, the cloth guide member 1 is rocked in the longitudinal direction of the pile fabric loom and in a

predetermined manner of operation by the terry motion (not shown).

[0019] The woven cloth W is moved forward in accordance with the weaving operation and smoothly enter into the wedge-shaped space 21. In the wedge-shaped space 21, the piles of the woven cloth W are gradually laid down back by the contact surface 20 of the pile orientation member 18. At the contacting point between the contact surface 20 and the cloth guide member 1, the piles of the woven cloth W receive strong pressing force due to the urging force of the leaf springs 16 to be pressed against the woven cloth W. Furthermore, since the cloth guide member 1 is rocked reciprocally over the above longitudinal moving range L shown in Fig. 2 by the terry motion, the piles on the contact surface 20 receives a force due to sliding contact while simultaneously receiving strong pressing force due to the urging force of the leaf spring 16. That is, the piles thus laid down are pressed firmly as if being ironed.

[0020] The woven cloth W thus receiving the pile orientation action leaves from the space 22 and wound stably around the winding roller (not shown) without allowing the piles to raise when passing through the surface roller 9 and the guide roller 10. Thus, the pile fabric loom equipped with the pile orientation device 11 having the pile orientation member 18 can produce a woven cloth W whose piles are stably oriented in one direction by the synergetic effects of the strong pressing force against the piles and sliding contact force by terry motion.

[0021] If mispicking of weft or yarn breakage of warp yarn Y occurs during weaving operation, the pile fabric loom is driven in reverse direction for repairing. When the pile fabric loom is moved in the reverse direction, the woven cloth W is moved rearward. Since the piles are laid down firmly, the woven cloth W smoothly enters into the wedge-shaped space 22 without allowing the piles to rise at the contacting point of the pile orientation member 18 by being pulled by the contact surface 20. Therefore, there is no fear of a defect such as friction mark which may occur when the pile fabric loom is driven in reverse direction.

[0022] The first preferred embodiment of the present invention offers the following advantageous effects.

(1) The pile orientation device 11 can orient piles in one direction firmly by the synergetic effects of the strong pressing force and sliding contact force by the terry motion.

(2) The woven cloth W is not bent when the woven cloth W is pressed against the rigid cloth guide member 1 by the pile orientation member 18, so that the pile orientation member 18 can apply the urging force of the leaf spring 16 directly to the woven cloth W, thereby improving the pressing force against the piles. Since the leaf springs 16 are changeable, leaf springs with the desired magnitude of pressing force may be selected depending on types of the woven

cloth W to be woven.

(3) Since the leaf spring 16 can absorb vibration, the desired pressing force against the piles may be kept substantially constant without receiving the influence of vibration generated during weaving operation of the pile fabric loom.

(4) Since the contact surface 20 of the pile orientation member 18 is disposed along the moving direction of the cloth guide member 1, there is no fear that the contact surface 20 of the pile orientation member 18 may collide with the cloth guide member 1 rocking by the terry motion and the woven cloth W is damaged or the terry motion is blocked.

[0023] The following will describe a second preferred embodiment of the present invention with reference to Fig. 4. The second preferred embodiment differs from the first preferred embodiment in that the cloth guide member 1 and the pile orientation member 18 are modified. The same reference numerals are used to denote those components or elements which correspond to the counterparts of the first preferred embodiment and the description thereof will be omitted.

[0024] According to the second preferred embodiment of the present invention, the cylindrical supporting member 23 is fixed to the upper end of the rocking member 2 and a beam-shaped cloth guide member 24 extending in the cloth width direction is fixed to the supporting member 23. The cloth guide member 24 has a flat pressure receiving surface 25 as a cloth guiding surface. A cylindrical pile orientation member 26 is fixed to the leaf springs 16 of the pile orientation device 11 by screws 19. The pile orientation member 26 is disposed so as to press the woven cloth W on the pressure receiving surface 25 of the cloth guide member 24. Thus, as in the case of the first preferred embodiment, a wedge-shaped space 27 and a wedge-shaped space 28 are formed between the cloth guide member 24 and the pile orientation member 26, and the woven cloth W enters into the wedge-shaped space 27 and leaves from the wedge-shaped space 28.

[0025] The cloth guide member 24 during the fast picking is indicated by the solid line and the cloth guide member 24 during the loose picking is indicated by the double-dashed line in Fig. 4, respectively. According to the second preferred embodiment of the present invention, strong pressing force exerted by the pile orientation member 26 against the piles and the sliding contact force generated by terry motion of the cloth guide member 24 are applied to the woven cloth W. Thus, according to the second preferred embodiment of the present invention, the synergetic effects of the strong pressing force and the sliding contact force are obtained, so that the woven cloth W whose piles are oriented in one direction firmly may be woven. Therefore, the same advantageous effects as those of the first preferred embodiment may be obtained.

[0026] The present invention is not limited to the first and second preferred embodiments described above, but it may be modified into various alternative embodiments as exemplified below.

(5) Referring to Fig. 5A showing a pile orientation device according to an alternative embodiment of the present invention, the pile orientation member 29 fixed to the leaf spring 16 by the screw 19 is formed to have a substantially plate shape as in the case of the first embodiment, but the contact surface 30 is formed on the upstream side thereof with respect to the moving direction of the woven cloth W with an arcuate surface 31. The provision of the arcuate surface 31 permits the woven cloth W to move smoothly past the pressing point between the pile orientation member 29 and the cloth guide member 1.

(6) Referring to Fig. 5B showing a pile orientation device according to another alternative embodiment of the present invention, the pile orientation member 32 fixed to the leaf spring 16 by the screw 19 is formed to have a plate shape and the contact surface 33 of the pile orientation member 32 is formed on the upstream and downstream side thereof with respect to the moving direction of the woven cloth W with arcuate surfaces 34 and 35, respectively. The provision of the arcuate surface 35 of the pile orientation member 32 permits the woven cloth W to smoothly enter into between the pile orientation member 32 and the cloth guide member 1 when the pile fabric loom is driven in reverse direction. Thus, the woven cloth W being moved reverse is prevented from damage..

(7) The pile orientation members 18, 26, 29, 32 according to the embodiments described above are not limited to the structure in which the urging force is provided by the leaf spring 16, but a pile orientation member may be formed such that the urging force is provided by its own weight.

(8) Forming a plate-shaped pile orientation member with an arcuate surface such as 31 shown in Fig. 5A or with arcuate surfaces such as 34, 35 shown in Fig. 5B, the cloth guide member 1 may have a planar guide surface for guiding the woven cloth W such as the cloth guide member 24 shown in Fig. 4.

(9) The pile orientation member 18, 26, 29, 32 is not limited to an arrangement wherein the pile orientation member is pressed against the cloth guide member 1 or 24 by the urging force of the leaf spring 16 or its own weight, but may be formed as exemplified below. The pile orientation member 18, 26, 29, 32 may be arranged to press the woven cloth W on the cloth guide member 1, 24 without applying urging

force or fixed so as to be spaced apart from the cloth guide member 1, 24 at an predetermined interval which is narrower than the thickness of the woven cloth W, such that the pile orientation member 18, 26, 29, 32 presses the woven cloth W on the cloth guide member 1, 24 by reaction force of the pulling function of the woven cloth W.

(10) The cloth guide member 1, 24 is not limited to an arrangement wherein it is rocked reciprocally as in the case of the preferred embodiments, but may be arranged so as to be moved reciprocally linearly.

(11) According to the present invention, the structure wherein the contact surface 20, 30 of the pile orientation member 18, 26, 29, 32 is disposed along the moving direction of the cloth guide member 1, 24 includes the following structures. When the cloth guide member 1, 24 is rocked reciprocally, the pile orientation member 18, 26, 29, 32 is not limited to a structure wherein the contact surface is parallel to a line that is the tangential to the contacting point, but may be disposed perpendicular to the tangential direction of the contacting point. When the cloth guide member 1, 24 is moved reciprocally linearly, the pile orientation member 18, 26, 29, 32 may be disposed parallel to or perpendicular to the linear moving direction of the cloth guide member 1, 24.

[0027] A pile orientation device for pile fabric loom includes a cloth guide member and a pile orientation member. The pile fabric loom for producing a woven cloth has a terry motion. The woven cloth is moved reciprocally in the front-and-rear direction of the pile fabric loom to shift a cloth fell position by the terry motion and piles are formed in the woven cloth by the terry motion. The cloth guide member is movable reciprocally in the front-and-rear direction of the pile fabric loom by the terry motion and guides the woven cloth toward the winding side of the pile fabric loom. The pile orientation member is used for pressing the woven cloth on the cloth guide member. The pile orientation member is mounted on the pile fabric loom without being moved in the front-and-rear direction of the pile fabric loom by the terry motion.

Claims

1. A pile orientation device (11) for pile fabric loom, the pile fabric loom for producing a woven cloth (W) having a terry motion, the woven cloth (W) moved reciprocally in the front-and-rear direction of the pile fabric loom to shift a position of cloth fell (W1) by the terry motion, piles formed in the woven cloth (W) by the terry motion, the pile orientation device (11) comprising: i
a cloth guide member (1, 24) being movable reciprocally in the front-and-rear direction of the pile fabric

loom by the terry motion and guiding the woven cloth (W) toward the winding side of the pile fabric loom, **characterized in that** the pile orientation device (11) includes a pile orientation member (18, 26, 29, 32) for pressing the woven cloth (W) on the cloth guide member (1, 24), and the pile orientation member (18, 26, 29, 32) is mounted on the pile fabric loom without being moved in the front-and-rear direction of the pile fabric loom by the terry motion.

2. The pile orientation device (11) according to claim 1, **characterized in that** the pile orientation member (18, 26, 29, 32) having a contact surface (20, 30, 33) pressing the woven cloth (W) on the cloth guide member (1, 24), the contact surface (20, 30, 33) is disposed along the moving direction of the cloth guide member (1, 24).
3. The pile orientation device (11) according to claim 1 or 2, **characterized in that** the contact surface (20, 30, 33) has a length covering a whole longitudinal moving range (L) of the cloth guide member (1, 24).
4. The pile orientation device (11) according to any one of claims 1 through 3, **characterized in that** a wedge-shaped space (21, 22, 27, 28) is formed between the contact surface (20, 30, 33) and the cloth guide member (1, 24), and the woven cloth (W) enters into the wedge-shaped space (21, 22, 27, 28).
5. The pile orientation device (11) according to claim 4, **characterized in that** the wedge shaped space (21, 22, 27, 28) is formed on the upstream side of the woven cloth (W) and the downstream side of the woven cloth (W), respectively, in relation to the contact surface (20, 30, 33) and the cloth guide member (1, 24).
6. The pile orientation device (11) according to any one of claims 1 through 5, **characterized in that** any one of the surface of the cloth guide member (1, 24) and the contact surface (20, 30, 33) is formed with a curved surface and the other is formed with a planar surface.
7. The pile orientation device (11) according to any one of claims 1 through 6, **characterized in that** the pile orientation member (18, 26, 29, 32) is pressed against the cloth guide member (1, 24) by urging force.
8. The pile orientation device (11) according to claim 7, **characterized in that** the urging force is generated by the leaf spring (16) or the weight of the pile orientation member (18, 26, 29, 32) itself.
9. The pile orientation device (11) according to any one of claims 1 through 8, **characterized in that** the pile

orientation member (18, 26, 29, 32) is fixed so as to be spaced apart from the cloth guide member (1, 24) at a predetermined interval such that the pile orientation member (18, 26, 29, 32) presses the woven cloth (W) on the cloth guide member (1, 24) by reaction force of the pulling function of the woven cloth (W). 5

10. The pile orientation device (11) according to any one of claims 1 through 9, **characterized in that** the pile orientation device (11) has a cylindrical supporting member (13), the cylindrical supporting member (13) is disposed so as to extend in the direction of weaving width of the pile fabric loom, fixedly mounted to a frame of the pile fabric loom by a bolt (15), and rotatable in the circumferential direction of the cylindrical supporting member (13) when the bolt (15) is loosened, and the pile orientation member (18, 26, 29, 32) is supported by the cylindrical supporting member (13). 10 15 20

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FIG. 1

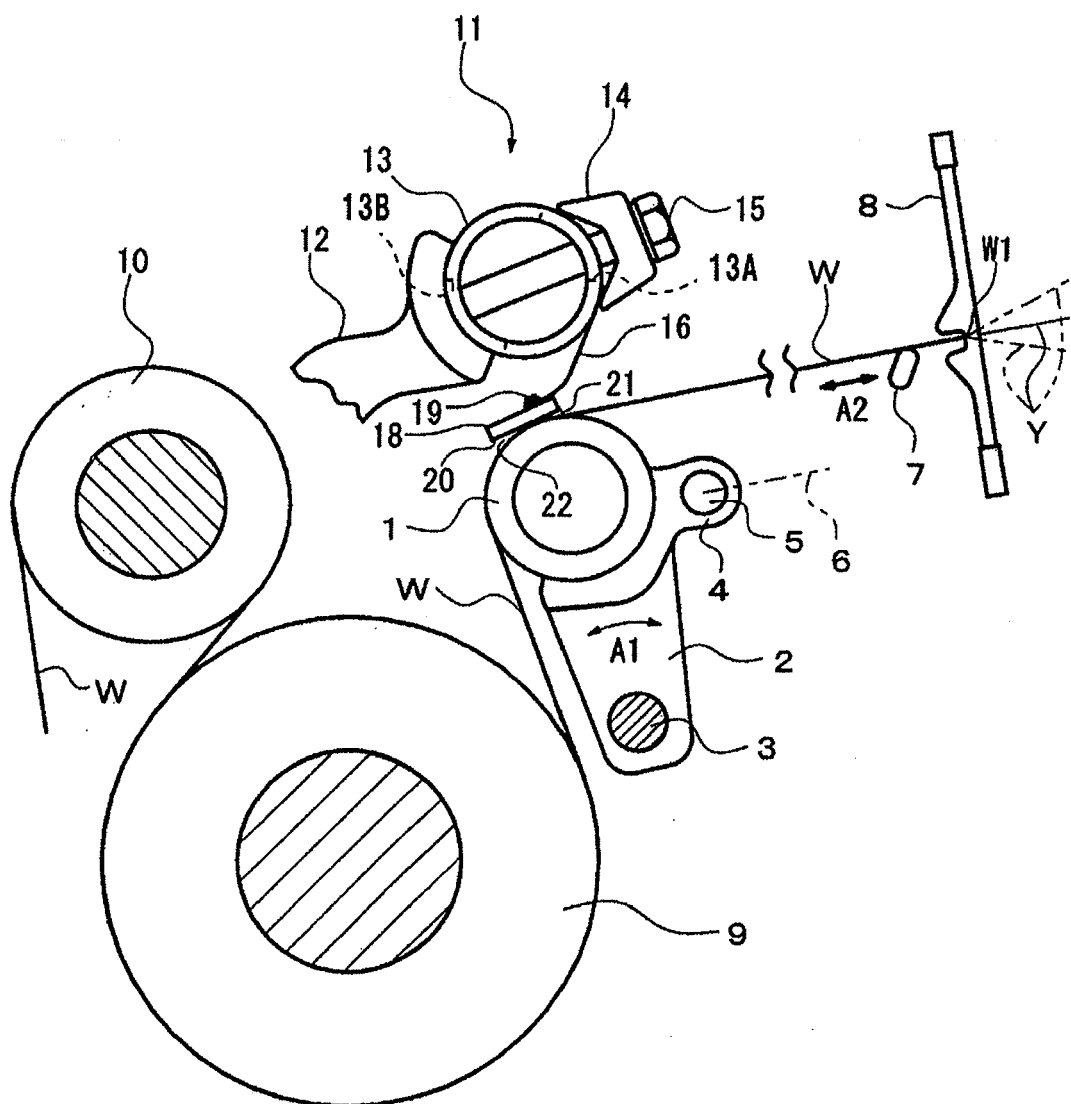


FIG. 2

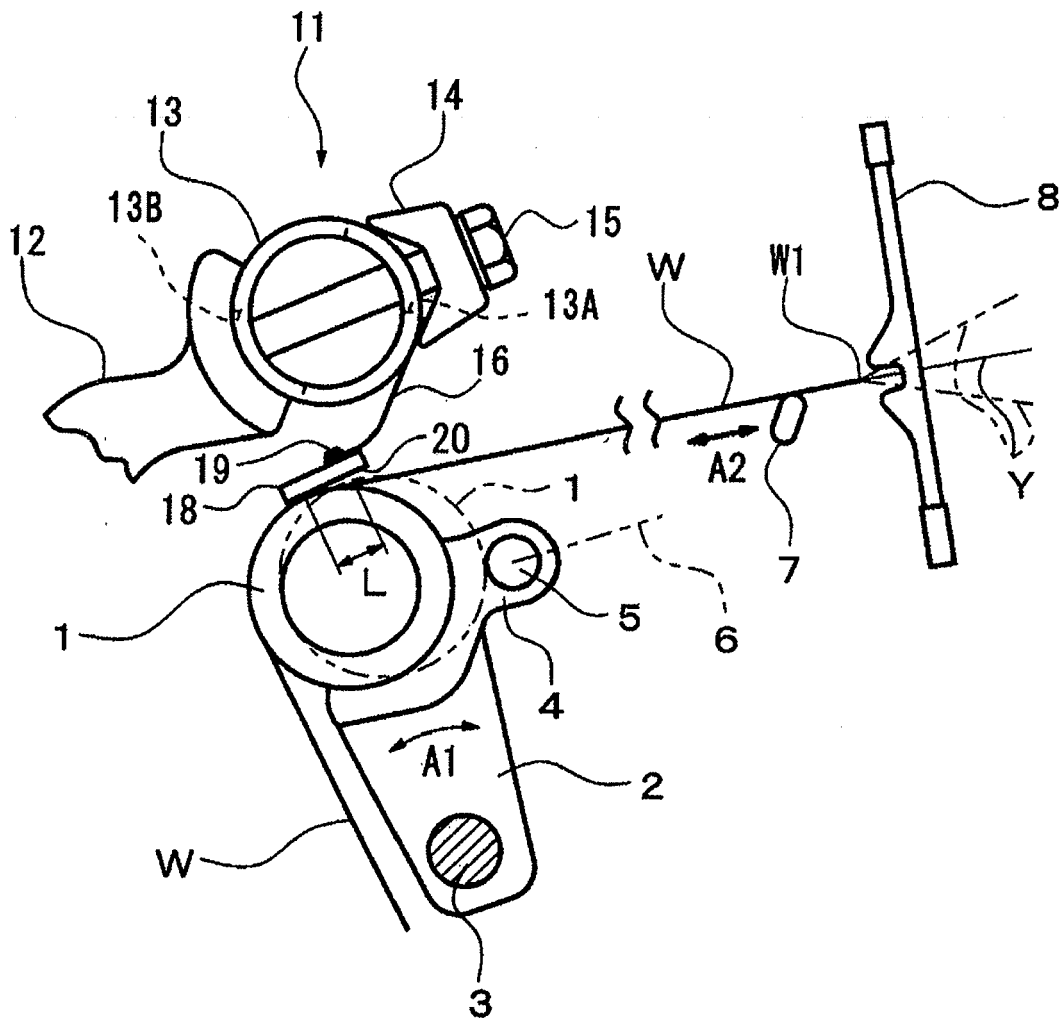


FIG. 3

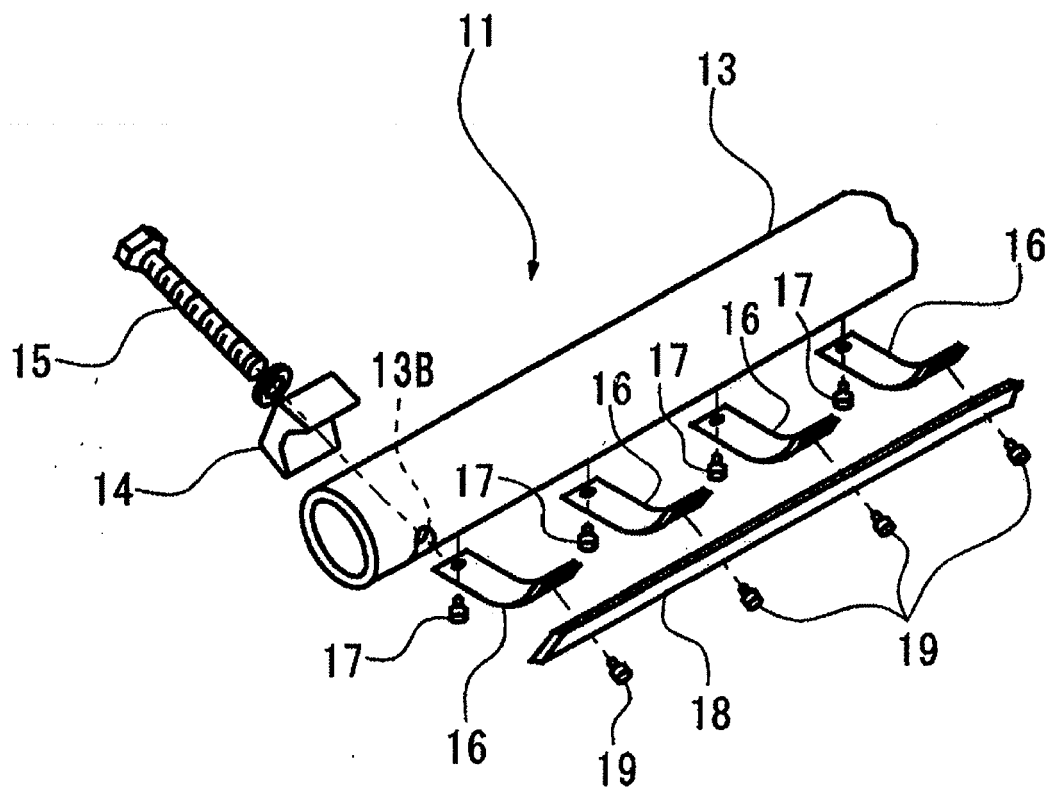


FIG. 4

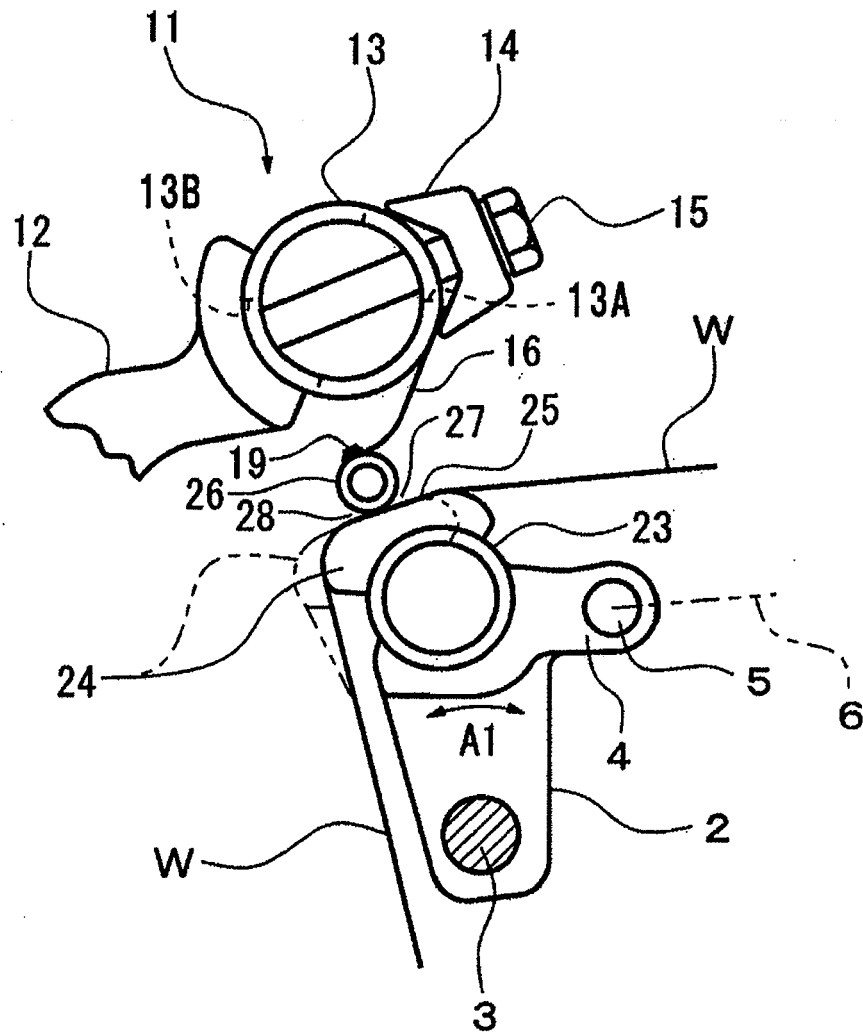


FIG. 5A

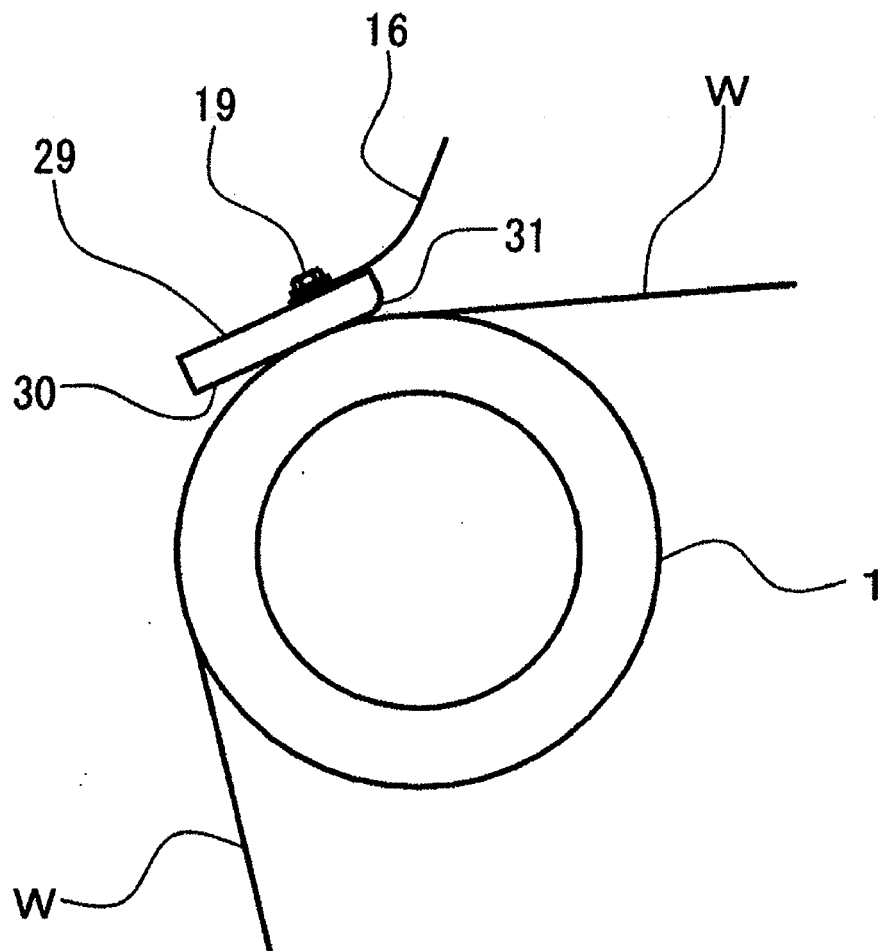
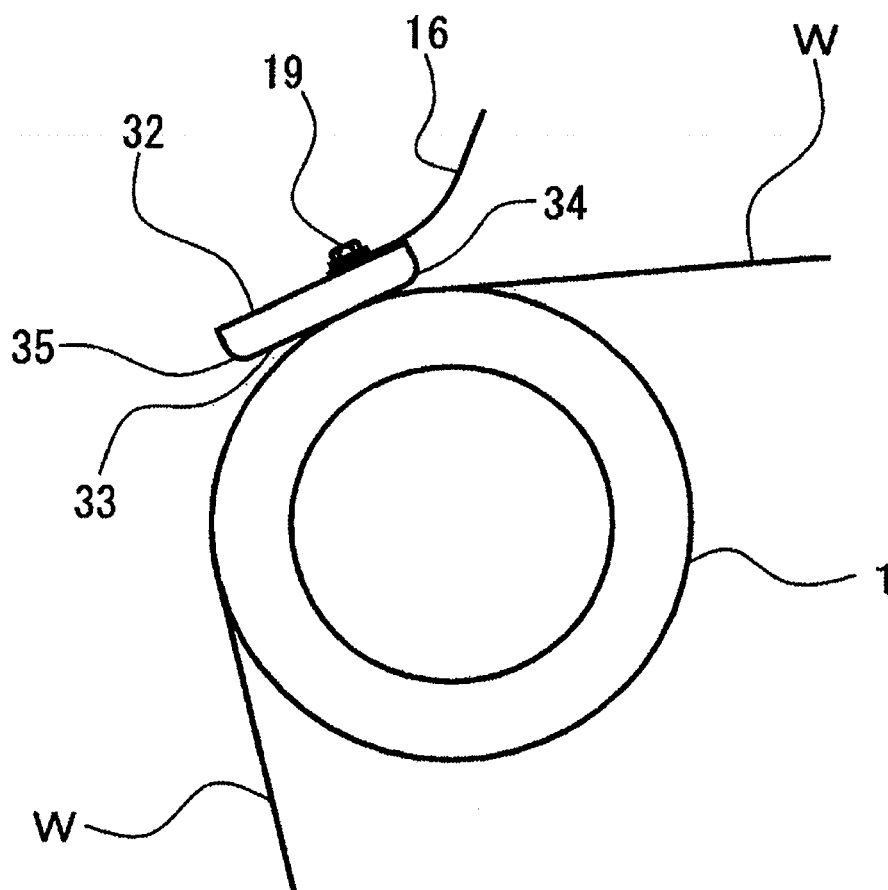


FIG. 5B





EUROPEAN SEARCH REPORT

Application Number
EP 10 19 6125

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 1 361 312 A (SULZER AG) 24 July 1974 (1974-07-24) * page 1, lines 29-36 * * page 1, lines 89-93 * * page 2, lines 45-59 * * figures 1-4 * -----	1-10	INV. D03D39/22 D03J1/06
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 April 2011	Examiner Louter, Petrus
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 19 6125

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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08-04-2011

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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