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(71) Applicant: **TSUDAKOMA KOGYO KABUSHIKI KAISHA**
Kanazawa-shi,
Ishikawa-ken 921-8650 (JP)

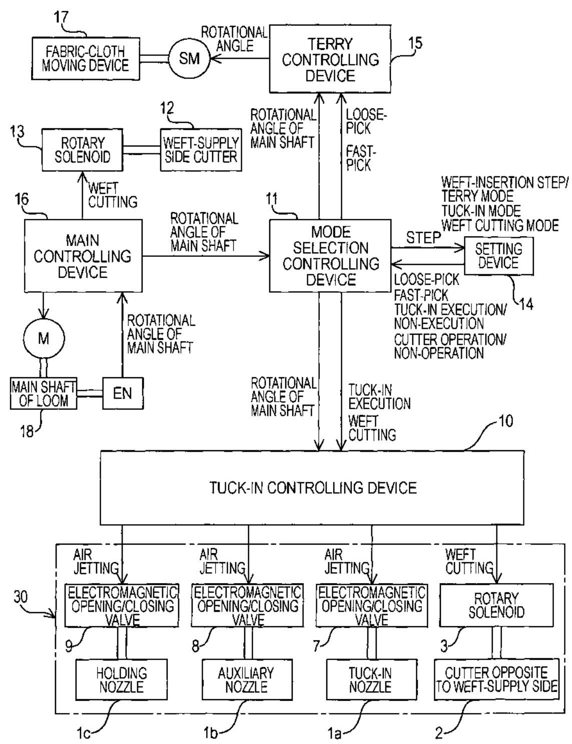
(72) Inventors:
- **Yamamoto, Akihiko**
Kanazawa-shi
Ishikawa-ken
921-8650 (JP)
- **Isa, Yukio**
Kanazawa-shi
Ishikawa-ken
921-8650 (JP)

(74) Representative: **Samson & Partner**
Widenmayerstrasse 5
80538 München (DE)

(54) **Air-type tuck-in method and corresponding device for pile loom**

(57) An air-type tuck-in device (30) is provided for a pile loom including a terry motion member (17) that changes a cloth-fell position and a beating-up position relative to each other, a dedicated actuator (SM) for the terry motion member (17), the air-type tuck-in device (30), a tuck-in controlling device (10), a setting device (14) that has set therein, as control data, a plurality of terry modes, and a terry motion controlling device (15) that controls the actuator (SM). The setting device (14) has recorded therein a plurality of tuck-in modes including, as information, the number of picks constituting one unit of pile formation cycle and particular picks at which tuck-in operations are performed. At least one of the number of picks and the particular picks is different in the plurality of tuck-in modes. The setting device (14) has set therein, as control data, the tuck-in modes for the respective terry modes. The tuck-in controlling device (10) performs a controlling operation on the basis of the tuck-in mode that is changed during the operation of the loom.

FIG. 3



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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an air-type tuck-in operation in a fabric-cloth moving type pile loom and in a beating-up position changing type pile loom.

2. Description of the Related Art

[0002] In a pile loom, a relative distance between a cloth-fell position of a fabric cloth and a beating-up position for a loose-pick and that for a fast-pick are made different from each other. In a fast-pick beating-up operation, the cloth-fell position and the beating-up position substantially coincide with each other. In contrast, in a loose-pick beating-up operation, the relative distance is large, though this depends upon a predetermined pile length. The pile loom is what is called a fabric-cloth moving type pile loom. To set the relative distance in the loose-pick beating-up operation and that in the fast-pick beating-up operation different from each other, the fabric cloth is moved each time a change is made from the loose-pick to the fast-pick or from the fast-pick to the loose-pick. In Japanese Unexamined Patent Application Publication No. 7-133550, to move the fabric cloth, a servo motor is provided as a dedicated actuator that drives a fabric-cloth moving device, which is a terry motion device. The servo motor is controlled by a controlling device that is different from a controlling device of a loom motor. Accordingly, during the operation of the loom, it is possible to change the numbers of weft for the respective loose-pick and fast-pick (constituting one unit of pile formation cycle), that is, to change a terry mode. Therefore, pile cloths having various textures and designs can be produced. In addition to a fabric-cloth moving type pile loom, what is called a beating-up position changing type pile loom is also available as a pile loom. In the beating-up position changing type pile loom, a beating-up position in a loose-pick beating-up operation and that in a fast-pick beating-up operation are made different from each other, so that the relative distance is large during the loose-pick beating-up operation.

[0003] A tuck-in selvage may be formed as a selvage structure in a pile fabric. In Japanese Patent No. 3357860, a tuck-in selvage having a good appearance is obtained as follows. In one unit of pile formation cycle, tuck-in operations are separately performed a plurality of times. In at least one of the plurality of tuck-in operations, a plurality of weft ends are tucked in together. Each time the weft ends are tucked in, air is jetted towards a warp shed from a nozzle disposed close to the fabric cloth ends, so that the weft ends are folded into the fabric cloth.

[0004] However, in the fabric-cloth moving type pile loom, when tuck-in operations are separately performed a plurality of times, and a terry mode is changed during the operation of the loom, the following takes place. As the fabric cloth moves, intersection positions of an upper warp and a lower warp (where a warp shed spreads towards a let-off side), that is, a cloth fell position, where a fast-pick is beaten up and formed, and a warp intersection position, where a loose-pick is beaten up and formed, are moved with respect to the nozzle that jets the tuck-in air. This causes a space in which the folded weft ends are inserted to be moved. Therefore, depending upon the terry mode, it becomes difficult to insert the weft ends into the warp shed, as a result of which the weft ends are erroneously tucked in, thereby impairing the quality of the pile fabric. Even in the beating-up position changing type pile loom, when the tuck-in operations are separately performed a plurality of times, and the terry mode is changed during the operation of the loom, the following takes place. As the beating-up position is changed, a warp intersection position, where a loose-pick is beaten up and formed, is moved towards a let-off side of the loom with respect to a cloth fell position, where a fast-pick is beaten up and formed. Then, the warp intersection position is moved with respect to the nozzle. As a result, a space in which the folded weft ends are inserted is moved. Consequently, after the loose-pick, that is, after the beating-up for the loose-pick, it becomes difficult to insert the weft ends into the weft shed, as a result of which the weft ends are erroneously tucked in, thereby impairing the quality of the pile fabric.

SUMMARY OF THE INVENTION

[0005] Accordingly, in view of the aforementioned problems of the related art, it is an object of the present invention to make it possible to, in a pile loom, perform a tuck-in operation even if a terry mode is changed during operation of the loom, and obtain a pile fabric having a tuck-in selvage with a good appearance.

[0006] To this end, according to one aspect of the present invention, there is provided an air-type tuck-in device of a pile loom including a terry motion member that changes a cloth-fell position and a beating-up position relative to each other for pile formation, a dedicated actuator that drives the terry motion member, the air-type tuck-in device that forms a selvage structure as a result of folding a weft end by air jetting, a tuck-in controlling device, a setting device that has set therein, as control data, a plurality of terry modes, and a terry motion controlling device that controls the actuator on the basis of the terry mode that is changed during operation of the loom. At least one of the number of loose-picks and the number of fast-picks differs in the terry modes. The number of loose-picks and fast-picks constitute one unit of pile formation cycle. The setting device has recorded therein a plurality of tuck-in modes including, as information, the number of picks, constituting the one unit of pile formation cycle, and particular picks at which tuck-in operations are performed in the cycle. At least one of the number of picks and the particular picks are different in the plurality of tuck-in modes. In addition, the setting device has set therein, as control data, the tuck-in modes for the respective terry modes. The tuck-in controlling device controls the air-type tuck-in device on the basis of the tuck-in mode that is changed during the operation of the loom.

[0007] In a first form, the control data includes the plurality of terry modes, information regarding the number of repetition of each terry mode, the order of execution of each terry mode, and the tuck-in modes corresponding to the respective terry modes.

[0008] In second form, the control data is such that, when the terry modes of a same type are executed at different times, one tuck-in mode among the plurality of tuck-in modes is set at all times with respect to the terry modes of the same type that are executed at the different times.

[0009] In a third form, the control data is such that, when the terry modes of a same type are executed at different times, different tuck-in modes among the plurality of tuck-in modes are set with respect to the particular terry modes that are executed at the different times and that are of the same type.

[0010] According to another aspect of the present invention, there is provided an air-type tuck-in method of a pile loom, which is applied to the pile loom and which forms a selvage structure as a result of folding a weft end by air jetting by an air-type tuck-in device. In the pile loom, a cloth-fell position and a beating-up position are changed relative to each other by a dedicated actuator for pile formation, a plurality of terry modes are set, and the actuator is controlled on the basis of the terry mode that is changed during operation of the loom. At least one of the number of loose-picks and the number of fast-picks are different in the plurality of terry modes. The number of loose-picks and the number of fast-picks constitute one unit of pile formation cycle. In the method, a plurality of tuck-in modes are recorded. The plurality of tuck-in modes include, as information, the number of picks, constituting the one unit of pile formation cycle, and particular picks at which tuck-in operations are performed in the cycle. At least one of the number of picks and the particular picks are different in the plurality of tuck-in modes. In addition, in the method, the plurality of tuck-in modes are set as control data for the respective terry modes, and the air-type tuck-in device is controlled on the basis of the tuck-in mode that is changed during the operation of the loom.

[0011] According to the two aspects of the present invention, among tuck-in periods in the cycle, that is, among loose-picks and fast-picks in the cycle, a pick, at which a weft end is tucked into a fabric cloth as a result of jetting air from a nozzle, is set for each terry mode as a tuck-in mode. When a terry mode during the operation of the loom is changed, it is possible to change to a tuck-in mode that is suitable for the terry mode. Therefore, in the pile loom, even if a terry mode is changed during the operation of the loom, tuck-in operations at picks suitable for the respective terry modes are executed. Consequently, erroneous tuck-in operations are reduced, and tuck-in selvages having good appearances are formed, so that a high-quality pile fabric can be obtained.

[0012] According to the first form, in the pile loom, terry modes and tuck-in modes corresponding to the terry modes are both controlled in a programmable manner. In addition, different terry modes are repeated. Therefore, a pile fabric having a predetermined texture and a tuck-in selvage having a good appearance are obtained.

[0013] According to the second form, since one tuck-in mode is only set for the same terry mode type, programming is facilitated.

[0014] According to the third form, even for the same terry mode type, tuck-in modes that are different from other tuck-in modes are set for particular terry modes. Therefore, even for the same terry mode type, different weaving conditions, such as different weft types, fabric structures, and densities, can be set. Consequently, a suitable tuck-in mode that is in accordance with the weaving condition can be set.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a plan view of air-type tuck-in devices 30 according to a first embodiment of the present invention, the air-type tuck-in devices 30 being disposed at a weft-supply side and a side opposite to the weft-supply side of a fabric-cloth moving type pile loom;

Figs. 2A and 2B are enlarged views of a main portion of the air-type tuck-in device 30 disposed at the side opposite to the weft-supply side according to the first embodiment;

Fig. 3 is a block diagram of a controlling system of the air-type tuck-in device 30 according to the first embodiment;

Fig. 4 is a table showing tuck-in modes recorded for respective terry modes in a setting device 14 in the first embodiment;

Fig. 5 is a table showing exemplary control data that is set in the setting device 14 in the first embodiment;

Fig. 6 is a table showing tuck-in modes for respective terry modes recorded in a setting device 14 in a second embodiment of the present invention;

Fig. 7 is a table showing exemplary control data that is set in the setting device 14 according to the second embodiment of the present invention;

Fig. 8 is a table showing tuck-in modes for respective terry modes recorded in a setting device 14 in a third embodiment of the present invention that is applied to a beating-up position changing type pile loom; and

Fig. 9 is a table showing exemplary control data that is set in the setting device 14 in the third embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Embodiments of the present invention will hereunder be described with reference to the drawings. Figs. 1 to 3 each show air-type tuck-in devices 30 of a fabric-cloth moving type pile loom according to a first embodiment of the present invention. Fig. 4 is a table showing tuck-in modes recorded for respective terry modes in a setting device 14. Fig. 5 is a table showing exemplary control data that is set in the setting device 14, and showing terry modes and tuck-in modes that are set in programmable manner for respective picks, that is, for respective weft-insertion steps. In the embodiment, a fabric-cloth moving type pile loom is applied to an air jet loom. Fig. 1 is a plan view of the entire loom in a weaving width direction of the loom from a weft-supply side, where a main nozzle 5 is disposed, to a side opposite to the weft-supply side. Fig. 1 also shows the air-type tuck-in devices 30 disposed at the weft-supply side and the side opposite to the weft-supply side. Figs. 2A and 2B are enlarged views of a main portion of the air-type tuck-in device 30 disposed at the side opposite to the weft-supply side. Fig. 2A is a plan view, and Fig. 2B is a side view as viewed from the weaving width direction from the side opposite to the weft-supply side in Fig. 2A. Fig. 3 is a block diagram of a controlling system of the air-type tuck-in device 30.

[0017] As shown in Fig. 1, the air-type tuck-in devices 30 are disposed at the weft-supply side and the side opposite to the weft-supply side of the loom. The air-type tuck-in devices 30 include respective tuck-in bodies 1, one being adjacent to a fabric-cloth end Ca at the weft-supply side of a fabric cloth C, and the other being adjacent to a fabric-cloth end Ca at the side opposite to the weft-supply side. As shown in Figs. 2A and 2B, each tuck-in body 1 has a block form having a weft-guide slit 1e opening towards a reed 6 and extending in the weaving width direction. A weft end Ya of an inserted weft Y advances towards the weft guide slit 1e when a beating-up operation is performed, and reaches a back wall defining the weft guide slit 1e. Each tuck-in body 1 has a plurality of tuck-in nozzles 1a provided vertically on respective sides of the weft-guide slit 1e and opening towards a side of the fabric-cloth end Ca. Axial lines of the upper and lower tuck-in nozzles 1a intersect each other at the fabric-cloth end Ca side. In addition, each tuck-in body 1 has an auxiliary nozzle 1b at the back wall defining the weft-guide slit 1e. Each auxiliary nozzle 1b extends in a direction of extension of a warp W, that is, in a warp line direction, and opens towards the reed. Further, each tuck-in body 1 has a holding nozzle 1c near the back wall defining the weft guide slit 1e. Each holding nozzle 1c passes vertically through the upper portion of the corresponding tuck-in body 1, and opens into the corresponding weft guide slit 1e. Still further, each tuck-in body 1 has a holding hole 1d near the back wall defining the weft guide slit 1e. Each holding hole 1d passes vertically through the lower portion of the corresponding tuck-in body 1, opens into the corresponding weft guide slit 1e, and faces the corresponding holding nozzle 1c with the corresponding weft guide slit 1e being disposed therebetween.

[0018] A weft-supply-side cutter 12 and a cutter 2 at a side opposite to the weft supply side are provided adjacent to the respective tuck-in bodies 1. The weft-supply-side cutter 12 is driven by a rotary solenoid 13, and the cutter 2 at the side opposite to the weft supply side is driven by a rotary solenoid 3. Further an ejector 4 is disposed at the side opposite to the weft supply side of the loom. A weft suction port opens adjacent to the cutter 2 disposed at the side opposite to the weft supply side. Two weft sensors 7 are provided at an end opposite to the weft supply side of the reed 6, and detect an erroneous weft insertion.

[0019] The controlling system of each air-type tuck-in device 30 will be described with reference to the block diagram of Fig. 3. An encoder EN detects a rotational angle of a loom main shaft 18 driven by a loom motor M, and outputs the main-shaft rotational angle as a main-shaft rotational angle signal to a main controlling device 16. On the basis of the main-shaft rotational angle signal from the encoder EN, when a predetermined main-shaft rotational angle is, for example, 35 degrees, the main controlling device 16 excites the rotary solenoid 13 to operate the weft-supply-side cutter 12, so that a weft Y is beaten up and, then, is cut. In addition, the main controlling device 16 controls air jetting from the main nozzle 5 and a sub-nozzle (not shown). Further, the main controlling device 16 outputs the main-shaft rotational angle signal to a mode selection controlling device 11. On the basis of the main-shaft rotational angle signal, the mode selection controlling device 11 determines a step, that is, a weft-insertion order (or a pick order) in one weaving pattern that is repeated, to output a step signal to the setting device 14.

[0020] The setting device 14 includes an inputting section (not shown), having a keyboard or an input screen, and a storage section. The setting device 14 records a plurality of different tuck-in modes (as shown in the table in Fig. 4), and, as control data, one of a plurality of terry modes for each step, that is, for each weft-insertion pick (as shown in the table in Fig. 5), and a tuck-in mode of a number shown in the table in Fig. 4 for each terry mode, so that a same tuck-in mode type is set for a same terry mode type. For setting a terry mode and a tuck-in mode for each step, the control data includes the plurality of terry modes, information regarding the number of repetitions of each terry mode, and each terry mode execution order. In the example shown in Fig. 5, one unit of weaving cycle that is repeated during the weaving comprises 26 steps (from Step 1 to Step 26), that is, 26 picks. The control data includes information regarding 2L1F x 2 + 3L2F x 1 + 2L1F x 1 + 3L1F x 2 + 2L2F, which is information constituting one unit of weaving cycle. More specifically, the control data includes information regarding execution of weavings in terry modes 2L1F for Steps 1 to 6 (that is, a total of two weaving operations, in which, in each weaving operation, the number of picks constituting one unit of pile formation cycle is 3, with the number of loose-picks being 2 and the number of fast-picks being 1), information regarding execution of weaving in a terry mode 3L2F for Steps 7 to 11 (that is, a total of one weaving operation, in which the number of picks constituting one unit of pile formation cycle is 5, with the number of loose-picks being 3 and the number of fast-picks being 2), information regarding execution of a total of one weaving in a terry mode 2L1F for Steps 12 to 14, information regarding execution of weavings in terry mode 3L1F (that is, a total of two weaving operations, in which, in each weaving operation, the number of picks constituting one unit of pile formation cycle is 4, with the number of loose-picks being 3 and the number of fast-picks being 1), and information regarding execution of weaving in a terry mode 2L2F for Steps 23 to 26 (that is, a total of one weaving operation in which the number of picks constituting one unit of pile formation cycle is 4, with the number of loose-picks being 2 and the number of fast-picks being 2).

[0021] In a method of inputting the control data, in the embodiment, terry mode information is input for a step in one unit of pile formation cycle. For example, in the example shown in Fig. 5, the information regarding the terry mode 2L1F is input for each of the Steps 1 to 6, the information regarding the terry mode 3L2F is input for each of the Steps 7 to 11, the information regarding the terry mode 2L1F is input for each of the Steps 12 to 14, the information regarding the terry mode 3L1F is input for each of the Steps 15 to 22, and the information regarding the terry mode 2L2F is input for each of the Steps 23 to 26, so that the information regarding the terry mode is input for each of the Steps 1 to 26 constituting the one unit of weaving cycle. Picks in respective steps of the one unit of weaving cycle, that is, loose-picks or fast-picks are automatically set at the setting device 14. That is, the loose-picks at the Steps 1, 2, 4, 5, 7, 8, 9, 12, 13, 15, 16, 17, 19, 20, 21, 23, and 24, and the fast-picks at the Steps 3, 6, 10, 11, 14, 18, 22, 25, and 26 are automatically set.

[0022] In another method of inputting control data, terry modes up to those constituting one unit of weaving cycle and the number of repetition of the terry modes are input in accordance with a weaving order. For example, in the example shown in Fig. 5, the following terry modes are successively input in the following order. That is, the terry mode 2L1F is input twice, the terry mode 3L2F is input once, the terry mode 2L1F is input once, the terry mode 3L1F is input twice, and the terry mode 2L2F is input once. As with the previous method, this causes picks of the respective steps of one unit of weaving cycle, that is, loose-picks or fast-picks to be automatically set at the setting device 14.

[0023] In still another method of inputting control data, loose-picks or fast-picks are input for the respective Steps 1 to 26 constituting one unit of weaving cycle. For example, in the example shown in Fig. 5, on the basis of information indicating that the terry mode 2L1F for Steps 1 to 6 is repeated twice, loose-picks are input for the Steps 1, 2, 4, and 5, and fast-picks are input for the Steps 3 and 6. On the basis of information indicating that the weaving in the terry mode 3L2F for Steps 7 to 11 is performed once, loose-picks are input for the Steps 7, 8, and 9, and fast-picks are input for the Steps 10 and 11. On the basis of information indicating that weaving in the terry mode 2L1F for Steps 12 to 14 is performed once, loose-picks are input for the Steps 12 and 13, and a fast-pick is input for Step 14. On the basis of information indicating that the terry mode 3L1F for Steps 15 to 22 is repeated twice, loose-picks are input for Steps 15, 16, 17, 19, 20, and 21, and fast-picks are input for Steps 18 and 22. On the basis of information indicating that the weaving in the terry mode 2L2F for Steps 23 to 26 is to be performed once, loose-picks are input for Steps 23 and 24, and fast-picks are input for Steps 25 and 26.

[0024] As shown in the table of Fig. 4, the setting device 14 has recorded therein a No. 1 tuck-in mode applied to the terry mode 2L1F, a No. 2 tuck-in mode applied to the terry mode 2L2F, a No. 3 tuck-in mode applied to the terry mode 3L1F, a No. 4 tuck-in mode applied to the terry mode 2L3F, a No. 5 tuck-in mode applied to the terry mode 3L2F, a No. 6 tuck-in mode applied to the terry mode 4L1F, a No. 7 tuck-in mode applied to the terry mode 2L4F, a No. 8 tuck-in mode applied to the terry mode 3L3F, and a No. 9 tuck-in mode applied to the terry mode 4L2F. In addition, the setting device 14 has recorded therein only one tuck-in mode for a plurality of different terry modes of the same type. The recorded tuck-in modes differ from each other in at least one of the number of picks for one unit of pile formation cycle and a particular pick at which a tuck-in operation is performed during the cycle. For the No. 1 tuck-in mode, the setting device 14 records therein 3 picks as the number of picks for one unit of pile formation cycle, and a first loose-pick (1st L) as the particular pick at which a tuck-in operation is performed during the pile formation cycle. For the No. 2 tuck-in mode, the setting device 14 records therein 4 picks as the number of picks in one unit of pile formation cycle, and two picks, a first loose-pick (1st L) and a second fast-pick (2nd F), as the particular picks at which tuck-in operations are performed during the pile formation cycle. Similarly for the other tuck-in modes, the setting device 14 records therein the number of picks for one unit of pile formation cycle, and a particular pick/particular picks at which a tuck-in operation/tuck-in operations are performed during the pile formation cycle.

[0025] In the embodiment, as shown in the table of Fig. 4, only one tuck-in mode is recorded for one terry mode, so that, even if periods of execution, that is, steps to be executed differ, one tuck-in mode is always set for the same terry mode type, and the tuck-in mode type is identified. Therefore, in the embodiment, an operation for setting the tuck-in modes for the respective terry modes as control data can be omitted because the tuck-in modes are automatically set as control data when the respective terry modes are set. That is, when the terry modes are set, the tuck-in modes are set as follows. That is, the tuck-in mode for executing tuck-in operations at the first loose-picks is set for the terry modes for Steps 1 to 6 and Steps 12 to 14. The tuck-in mode for executing tuck-in operations at the first and third loose-picks and the second fast-picks is set for the terry mode 3L2F for Steps 7 to 11. The tuck-in mode for executing tuck-in operations at the first and third loose-picks is set for the terry mode 3L1F for Steps 15 to 22. The tuck-in mode for executing tuck-in operations at the first loose-pick and the second fast-picks are set for the terry mode 2L2F for Steps 23 to 26. By this, as shown by check marks in the table of Fig. 5, as control data, executions of tuck-in operations are set for Steps 1, 4, 7, 9, 11, 12, 15, 17, 19, 21, 23, and 26.

[0026] Further, a weft cutting mode, that is, an operation pick in the one unit of pile formation cycle for the cutter 2 opposite to the weft-supply side is set as control data in the setting device 14. One or a plurality of weft ends Ya sucked in and held by the ejector 4 are cut together by the cutter 2 in the set step, so that the one or plurality of weft ends are cut to predetermined lengths and aligned no later than the tuck-in operation.

[0027] In Step 27 and the subsequent steps, the number of repetition of the one unit of weaving cycle is set, so that the loose-pick/loose-picks or the fast-pick/fast-picks for the corresponding step, execution or non-execution of a tuck-in operation, and operation or non-operation of the cutter 2 are automatically set.

[0028] On the basis of a step signal from the mode selection controlling device 11, the setting device 14 reads out from the control data, the loose-pick/loose-picks or fast-pick/fast-picks, the execution or non-execution of a tuck-in operation, and the operation or non-operation of the cutter 2. Then, the setting device 14 outputs the following signals to the mode selection controlling device 11: a loose-pick signal or a fast-pick signal, a tuck-in execution signal when a tuck-in execution step is to be performed, and a weft cutting signal when a step of operating the cutter 2 is performed.

[0029] In addition to branching and outputting the main-shaft rotational angle signal from the main controlling device 16 to a terry controlling device 15 serving as a terry motion controlling device, the mode selection controlling device 11 outputs a loose-pick signal or a fast-pick signal from the setting device 14 to the terry controlling device 15. Further, in addition to branching and outputting the main-shaft rotational angle signal from the main controlling device 16 to the tuck-in controlling device 10, the mode selection controlling device 11 outputs to the tuck-in controlling device 10 a tuck-in execution signal and a weft cutting signal on the basis of a tuck-in execution or non-execution signal and a cutter-2 operation or non-operation signal from the setting device 14.

[0030] In the embodiment, a loom moving device 17 is provided as a terry motion member. In addition, a servo motor SM is provided as a dedicated actuator that drives the terry motion member, to drive the loom moving device 17. The terry controlling device 15, serving as a terry motion controlling device, controls a rotational angle of the servo motor SM on the basis of a loose-pick signal or a fast-pick signal and a main-shaft rotational angle signal from the mode selection controlling device 11. That is, on the basis of a previous pick signal (loose-pick signal or fast-pick signal), the terry controlling device 15 determines whether a current pick signal is any one of a loose-pick signal during transition from a loose-pick to a loose-pick, a fast-pick signal during transition from a loose-pick to a fast-pick, a fast-pick signal during transition from a fast-pick to a fast-pick, and a loose-pick signal during transition from a fast-pick to a loose-pick. As indicated by "advance" and "withdraw" in the table shown in Fig. 5, in the case where the current pick signal is a fast-pick signal during transition from a loose-pick to a fast-pick and a loose-pick signal during transition from a fast-pick to a loose-pick, when a predetermined main-shaft rotational angle is reached, the servo motor SM is driven to set the rotational angle of the servo motor SM to a predetermined angle. By this, a cloth fell Cc of the fabric cloth C is moved so as to approach and match a beating-up position and so as to separate from the beating-up position when the predetermined main-shaft rotational angle is reached during the transition from a loose-pick to a fast-pick (steps indicated by "advance" in the table of Fig. 5) and during the transition from a fast-pick to a loose-pick (steps indicated by "withdraw" in the table of Fig. 5). In a fast-pick beating-up operation, what is called a "complete beating-up operation" is executed, whereas, in a loose-pick beating-up operation, what is called a "partial beating-up operation" is executed. In particular, a beating-up operation for a first fast-pick that is switched from a loose-pick causes the warp W to become a loop and to form a pile.

[0031] On the basis of a tuck-in execution signal, a weft cutting signal, and a main-shaft rotational angle signal from the mode selection controlling device 11, the tuck-in controlling device 10 opens electromagnetic opening-closing valves 7, 8, and 9 (which cause operation of the air-type tuck-in device 30, that is, which are connected to a high-pressure air supply source (not shown)) when the predetermined main-shaft rotational angle is reached. This causes high-pressure air to be supplied to the tuck-in nozzles 1a, auxiliary nozzles 1b, and holding nozzles 1c, so that air is jetted therefrom. On the basis of the input weft cutting signal and main-shaft rotational angle signal, the tuck-in controlling device 10 excites the rotary solenoid 3 when the predetermined main-shaft rotational angle is reached, to operate the cutter 2 disposed at the side opposite to the weft supply side.

[0032] Fig. 2 shows a 3-pick pile weaving state in which one unit of pile formation cycle includes three weft insertions, that is, three picks. In addition, Fig. 2 shows a state in which, for a terry mode, two loose-picks and one fast-pick, that is, 2L1F is selected, and the weft Y for the second loose-pick is inserted. The cutter 2 at the side opposite to the weft supply side is, as with the weft-supply side cutter 12, driven each time the loom is rotated once at the predetermined main-shaft rotational angle of, for example, 35 degrees, so that the weft end Ya is cut to a predetermined length. In addition, until a tuck-in operation is performed, the weft end Ya is stopped by the holding hole 1d by air jetted towards the holding hole 1d from the holding nozzle 1c. In the weft cutting mode in the embodiment, similarly to the weft-supply side cutter 12, the cutter 2 is driven at the predetermined main-shaft rotational angle of, for example, 35 degrees, to cut a plurality of weft ends Ya one at a time. However, it is possible to reduce the number of operations of the cutter 2 by cutting the plurality of weft ends Ya together for a predetermined pick in the pile formation cycle. This is effective when the weft Y is thin, so that it is possible to reduce the number of operations of the cutter 2 without erroneous cutting operations.

[0033] In the example shown in the table of Fig. 5, in Steps 1 to 6 and in Steps 27 to 32 after the one unit of weaving cycle including Steps 1 to 6, the terry mode 2L1F, that is, a pile formation cycle of two loose-picks and one fast-pick is set. In addition, the No. 1 tuck-in mode shown in Fig. 4, in which three weft ends Ya are tucked in together for the first loose-pick (the 1st L), is set. As indicated by "withdraw" in the table of Fig. 5, in the first loose-pick step, at the predetermined main-shaft rotational angle of, for example, 60 degrees, the servo motor SM has its rotational angle changed from its rotational angle at the "complete beating-up" position to its rotational angle at the "partial beating-up" position so that the cloth fell Cc moves from the "complete beating-up" position, where the aforementioned complete beating-up operation is executed, to the "partial beating-up" position, where the aforementioned partial beating-up operation is executed, and withdraws with respect to the reed 6. As indicated by check marks, in Steps 1, 4, 27, and 30, tuck-in operations are executed. Among these steps, in Steps 4 and 30, the weft ends Ya for a first loose-pick and a second loose-pick in a previous pile formation cycle are stopped by the holding hole 1d by air jetted from the holding nozzle 1c towards the holding hole 1d, and the jetting of the air from the holding nozzle 1c is stopped. In addition, after jetting the air from the auxiliary nozzle 1b and the auxiliary nozzle 1b, the air is jetted from the tuck-in nozzles 1a at the predetermined main-shaft rotational angles. This causes the weft ends Ya for the respective first loose-pick and second loose-pick to be folded into the fabric cloth C along with the weft end Ya for a first fast-pick, provided immediately after the weft end Ya for the first fast-pick is cut by the cutter 2. Then, the weft ends Ya are inserted into a warp shed that spreads towards a let-off side from the cloth fell Cc that withdraws from the reed 6, that is, the weft ends Ya are tucked in. As indicated by "advance" in the table of Fig. 5, in the first loose-pick step, at the predetermined main-shaft rotational angle of, for example 60 degrees, the servo motor SM has its rotational angle changed from its rotational angle at the "partial beating-up" position to its rotational angle at the "complete beating-up" position so that the cloth fell Cc advances towards the reed and moves from the "partial beating-up" position to the "complete beating-up" position. By a fast-pick beating-up operation, the three tucked-in weft ends Ya, and the wefts Y for the respective first loose-pick, second loose-pick, and first fast-pick are completely beaten up against the cloth fell Cc. As a result, a new cloth fell Cc of the fabric cloth C is formed, and a tuck-in selvage Cb is formed in the fabric cloth C.

[0034] Accordingly, the weft ends Ya for the previous pile formation cycle are tucked in for the first loose-pick. More specifically, the weft ends Ya are tucked in as a result of folding the weft ends Ya when the weft Y for the first loose-pick is inserted. Since the weft ends Ya are tucked in for the first loose-pick, the cloth fell Cc withdraws from the reed 6, and moves relative to the tuck-in nozzles 1a. Therefore, an insertion space of the weft ends Ya, formed at the warp shed connected to the moving cloth fell Cc, is enlarged, so that the weft ends Ya are easily tucked in. In any of the terry modes, the weft ends Ya are not tucked in when the weft Y for the fast-pick is inserted. When the weft Y for the fast-pick is inserted, the cloth fell Cc is moving towards the reed 6 from the "partial beating-up" position to the "complete beating-up" position." The warp shed is restricted by the weft Y for the loose-pick that is previously inserted, so that the warp shed spreads towards the reed 6 from the weft Y. In addition, when the cloth fell Cc moves, the warp shed moves towards the reed 6, to move relative to the tuck-in nozzles 1a. Therefore, when the weft ends Ya are tucked in when the weft Y for the first fast-pick is inserted, the weft ends Ya are inserted into the narrowed space for inserting the weft ends Ya. This is not desirable because erroneous tuck-in operations, such as the weft ends Ya not being inserted into the warp shed, easily occurs. According to the present invention, the tuck-in modes are recorded in the setting device 14 so that tuck-in modes for executing tuck-in operations for undesirable picks in the one unit of pile formation cycle are eliminated. Therefore, it is possible to prevent erroneous tuck-in operations, so that a high-quality fabric cloth can be provided.

[0035] In addition to setting, as the control data, the terry modes, tuck-in modes, and weft cutting modes for the respective weft-insertion steps in the setting device 14, an amount of movement of the fabric cloth C, that is, a driving amount of the servo motor SM, may be set in the setting device 14. For example, in the terry mode 4L2F and in terry modes not recorded in the setting device 14 in the embodiment and having a larger number of loose-picks, such as terry modes 5L2F and 6L1F, the movement of the fabric cloth C may be divided into a plurality of movement portions, so that the fabric cloth C may be moved by 1/2 of the movement amount, for each of the first loose-pick and the third loose-pick. A pile, formed by the beating-up operation for the following first fast-pick, is formed with two bulging portions, so that the fabric cloth has a special texture.

[0036] Figs. 6 and 7 show a second embodiment according to the present invention. Fig. 6 shows a table of tuck-in modes for respective terry modes, which are recorded in a setting device 14. Two tuck-in modes are recorded for each terry mode, except for a terry mode 3L3F. Fig. 7 shows an example of control data set in the setting device 14. In the embodiment, except for the terry mode 3L3F, a plurality of tuck-in modes are recorded for each terry mode. Therefore, an operation for setting the tuck-in modes for the respective terry modes as the control data is required. In the example shown in Fig. 7, for particular terry modes of the same type that are executed at different times, different tuck-in modes are set. More specifically, in the example shown in Fig. 7, terry modes 2L1F are set as particular terry modes that are executed at different times and that are of the same terry mode type. For the terry modes 2L1F, different periods of Steps 1 to 6 and Steps 12 to 14, that is, different steps are set. In addition, different tuck-in modes, a No. 1 tuck-in mode and a No. 2 tuck-in mode in the table shown in Fig. 6, are set. By this, even if the terry modes are of the same type, when different weaving conditions, such as different weft types, are set, the tuck-in mode that is suitable for the weaving condition is set as the control data.

[0037] Figs. 8 and 9 show a third embodiment of the present invention. The third embodiment is applied to a beating-up position changing type pile loom. The beating-up position changing type pile loom includes a beating-up member (not shown), serving as a terry motion member that drives a reed 6 either directly or through a link mechanism, and a servo motor SM, serving as a dedicated actuator that drives the beating-up member. In a fast-pick, the rotational angle of the servo motor SM is set large. During a beating-up operation, the reed 6 reaches a cloth fell Cc of a fabric cloth C, so that what is called a "complete beating-up" operation is performed. In a loose-pick, the rotational angle of the servo motor SM is set small. During a beating-up operation, the reed 6 does not reach the cloth fell Cc of the fabric cloth C, so that what is called a "partial beating-up" operation is performed. After the "partial beating-up" operation, a warp shed spreads towards the reed while being restricted by a weft Ya for the beaten-up loose-pick. After the "complete beating-up operation," the warp shed, serving as a space for inserting a weft end Ya, spreads towards the reed from the cloth fell Cc, whereas, after the "partial beating-up operation," the warp shed, serving as the space for inserting a weft end Ya, spreads towards a let-off side from an intersection of an upper warp and a lower warp, which is provided as a result of restricting the warp shed by the weft end Ya for the loose-pick. The warp shed is moved closer to the let-off side than after the "complete beating-up" operation is performed, thereby making it difficult to perform a tuck-in operation by the tuck-in nozzles 1a. Therefore, in picks following the fast-pick, that is, a first loose-pick, a second fast-pick, a third fast-pick, ..., tuck-in operations are reliably executed. In contrast, in picks following the loose-pick, that is, a second loose-pick, a third loose-pick, ..., and a first fast-pick, erroneous tuck-in operations, such as the weft end Ya not being inserted into the warp shed, easily occurs, which is not desirable. In the embodiment, the tuck-in modes are recorded in a setting device 14 so that tuck-in modes for executing tuck-in operations for undesirable picks in one unit of pile formation cycle are removed. Therefore, it is possible to prevent erroneous tuck-in operations.

[0038] Fig. 8 is a table showing tuck-in modes for respective terry modes recorded in the setting device 14. As in the second embodiment, a plurality of different tuck-in modes are recorded depending upon the terry mode type.

[0039] Fig. 9 is a table showing control data set in the setting device 14. A plurality of different tuck-in modes are recorded depending upon the terry mode type. Therefore, an operation for setting the tuck-in modes for the respective terry modes as control data is required. In the example shown in Fig. 9, for particular terry modes of the same type that are executed at different periods, different tuck-in modes are set. More specifically, in the example shown in Fig. 9, terry modes 2L2F and terry modes 2L3F are set as particular terry modes that are executed at different time periods and that are of the same terry mode type. For the terry modes 2L2F, different periods of Steps 1 to 8 and Steps 19 to 22, that is, different steps are set. In addition, different tuck-in modes, a No. 2 tuck-in mode and a No. 3 tuck-in mode in the table shown in Fig. 8, are set. By this, even if the terry modes are of the same types, when different weaving conditions, such as different weft types, are set, the tuck-in mode that is suitable for the weaving condition is set as the control data. Similarly to the terry modes 2L2F, for terry modes 2L3F, different periods of Steps 14 to 18 and Steps 23 to 27 are set. In addition, different tuck-in modes, a No. 6 tuck-in mode and a No. 5 tuck-in mode in the table shown in Fig. 8, are set.

[0040] In the control data shown in Fig. 9, for Steps 1 to 8, the terry modes 2L2F are set. In addition, tuck-in operations are set for the No. 2 tuck-in modes (shown in Fig. 8), that is, a first loose-pick and second fast-picks. For Steps 9 to 18, terry modes 2L3F are set. In addition, tuck-in operations are set for the No. 6 tuck-in modes (shown in Fig. 8), that is, first loose-picks and second fast-picks. For Steps 19 to 22, a terry mode 2L2F is set. In addition, tuck-in operations are set for the No. 3 tuck-in mode (shown in Fig. 8), that is, only for first loose-picks, so that four weft ends Ya are tucked in together. Accordingly, a plurality of weft ends Ya are tucked in together when, for example, the weft Y is thin, and the appearance of a tuck-in selvage Cb does not become poor when bumpy portions of the tuck-in selvage Cb become large even if the plurality of weft ends Ya are tucked in together. For Steps 23 to 27, a terry mode 2L3F is set. In addition, tuck-in operations are set for the No. 5 tuck-in mode (shown in Fig. 8), that is, a first loose-pick, second fast-picks, and a third fast-pick. Steps 1 to 27 constitute one unit of weaving cycle. For Step 28 and the subsequent steps, the number of repetition of one unit of weaving cycle is set, so that a loose-pick or a fast-pick in each step, execution or non-execution of a tuck-in operation, and operation or non-operation of a cutter 2 at a side opposite to a weft-supply side are automatically set.

[0041] The present invention is not limited to the above-described embodiments, so that various modifications can be made within the gist of the present invention.

Claims

1. An air-type tuck-in device (30) of a pile loom including a terry motion member (17) that changes a cloth-fell position and a beating-up position relative to each other for pile formation, a dedicated actuator (SM) that drives the terry motion member (17), the air-type tuck-in device (30) that forms a selvage structure as a result of folding a weft end by air jetting, a tuck-in controlling device (10), a setting device (14) that has set therein, as control data, a plurality of terry modes in which at least one of the number of loose-picks and the number of fast-picks differs, the number of loose-picks and fast-picks constituting one unit of pile formation cycle, and a terry motion controlling device (15) that controls the actuator (SM) on the basis of the terry mode that is changed during operation of the loom,
   wherein the setting device (14) has recorded therein a plurality of tuck-in modes including, as information, the number of picks, constituting the one unit of pile formation cycle, and particular picks at which tuck-in operations are performed in the cycle, at least one of the number of picks and the particular picks being different in the plurality of tuck-in modes,
   wherein the setting device (14) has set therein, as control data, the tuck-in modes for the respective terry modes, and
   wherein the tuck-in controlling device (10) controls the air-type tuck-in device (30) on the basis of the tuck-in mode that is changed during the operation of the loom.

2. The air-type tuck-in device (30) of the pile loom according to Claim 1, wherein the control data includes the plurality of terry modes, information regarding the number of repetition of each terry mode, the order of execution of each terry mode, and the tuck-in modes corresponding to the respective terry modes.

3. The air-type tuck-in device of the pile loom according to Claim 2, wherein the control data is such that, when the terry modes of a same type are executed at different times, one tuck-in mode among the plurality of tuck-in modes is set at all times with respect to the terry modes of the same type that are executed at the different times.

4. The air-type tuck-in device of the pile loom according to Claim 2, wherein the control data is such that, when the terry modes of a same type are executed at different times, different tuck-in modes among the plurality of tuck-in modes are set with respect to the particular terry modes that are executed at the different times and that are of the same type.

5. An air-type tuck-in method of a pile loom, which is applied to the pile loom and which forms a selvage structure as a result of folding a weft end by air jetting by an air-type tuck-in device, the pile loom having a cloth-fell position and a beating-up position changed relative to each other by a dedicated actuator for pile formation, having a plurality of terry modes set, and having the actuator controlled on the basis of the terry mode that is changed during operation of the loom, at least one of the number of loose-picks and the number of fast-picks being different in the plurality of terry modes, the number of loose-picks and the number of fast-picks constituting one unit of pile formation cycle,
   wherein a plurality of tuck-in modes are recorded, the plurality of tuck-in modes including, as information, the number of picks, constituting the one unit of pile formation cycle, and particular picks at which tuck-in operations are performed in the cycle, at least one of the number of picks and the particular picks being different in the plurality of tuck-in modes,
   wherein the plurality of tuck-in modes are set as control data for the respective terry modes, and
   wherein the air-type tuck-in device is controlled on the basis of the tuck-in mode that is changed during the operation of the loom.

FIG. 1

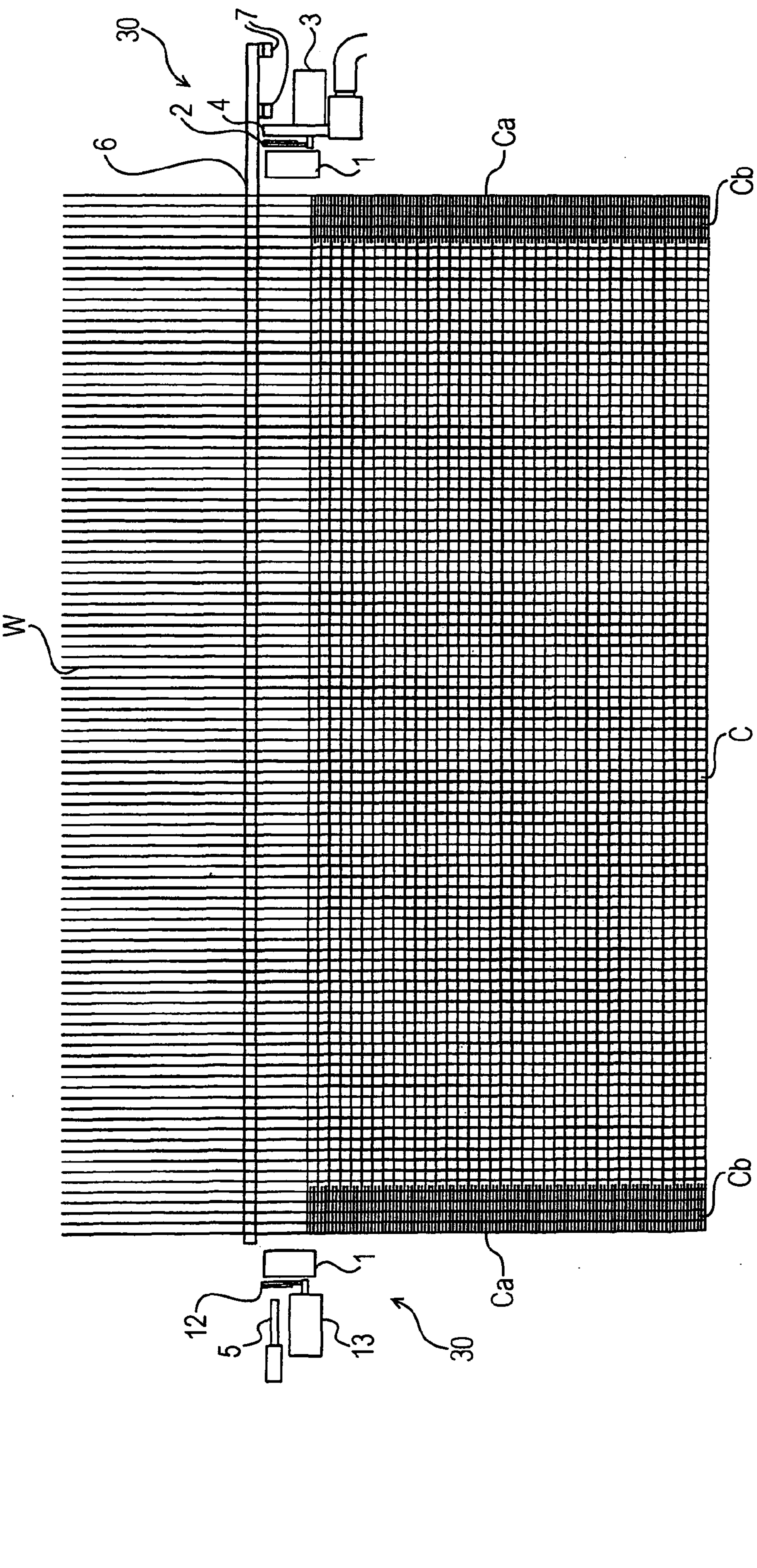

FIG. 2A

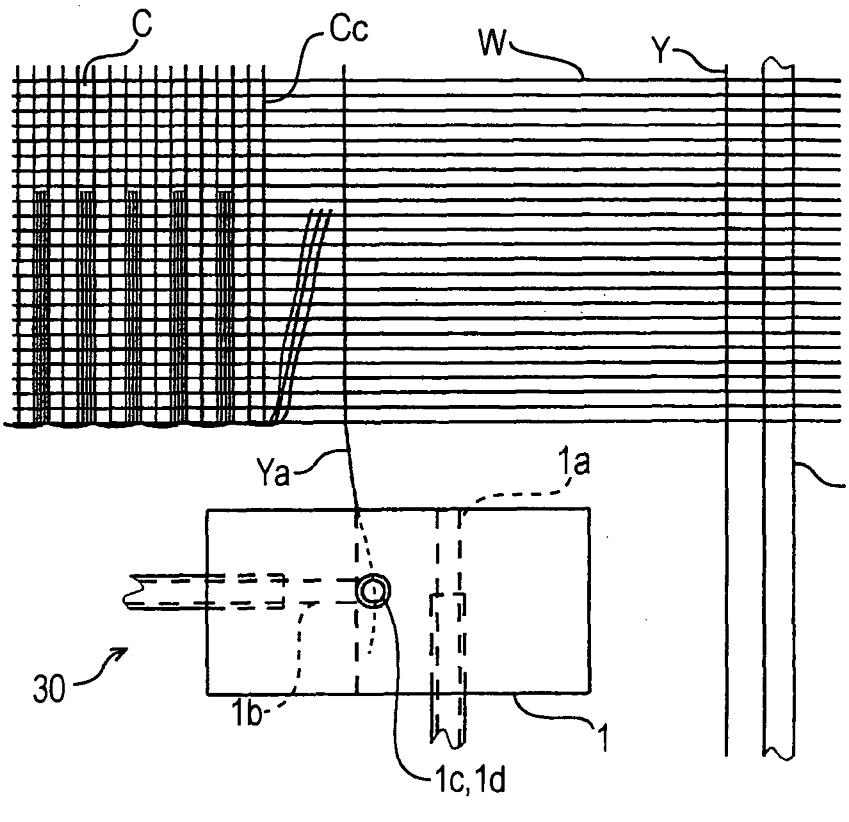

FIG. 2B

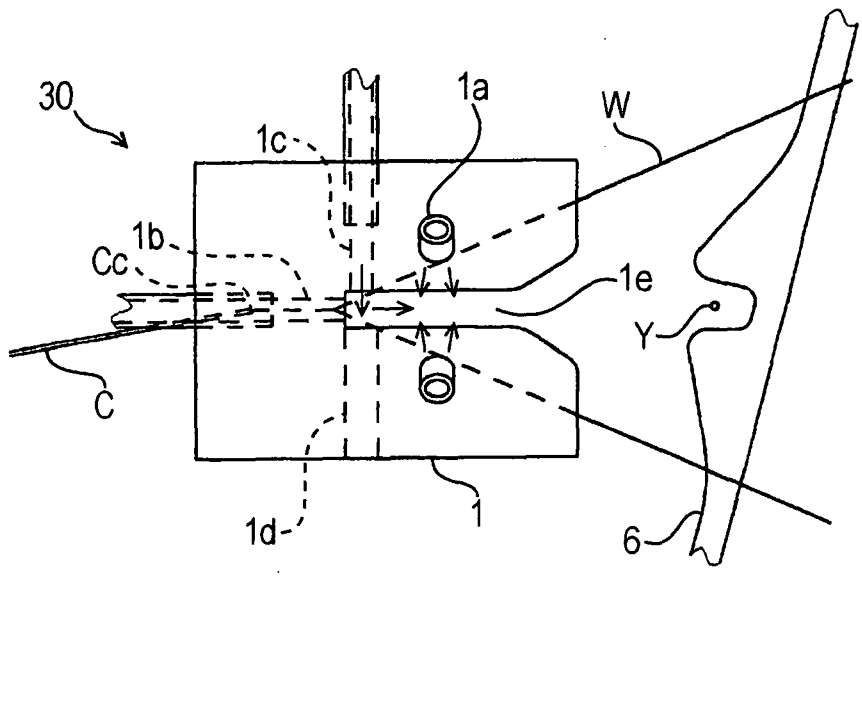

FIG. 3

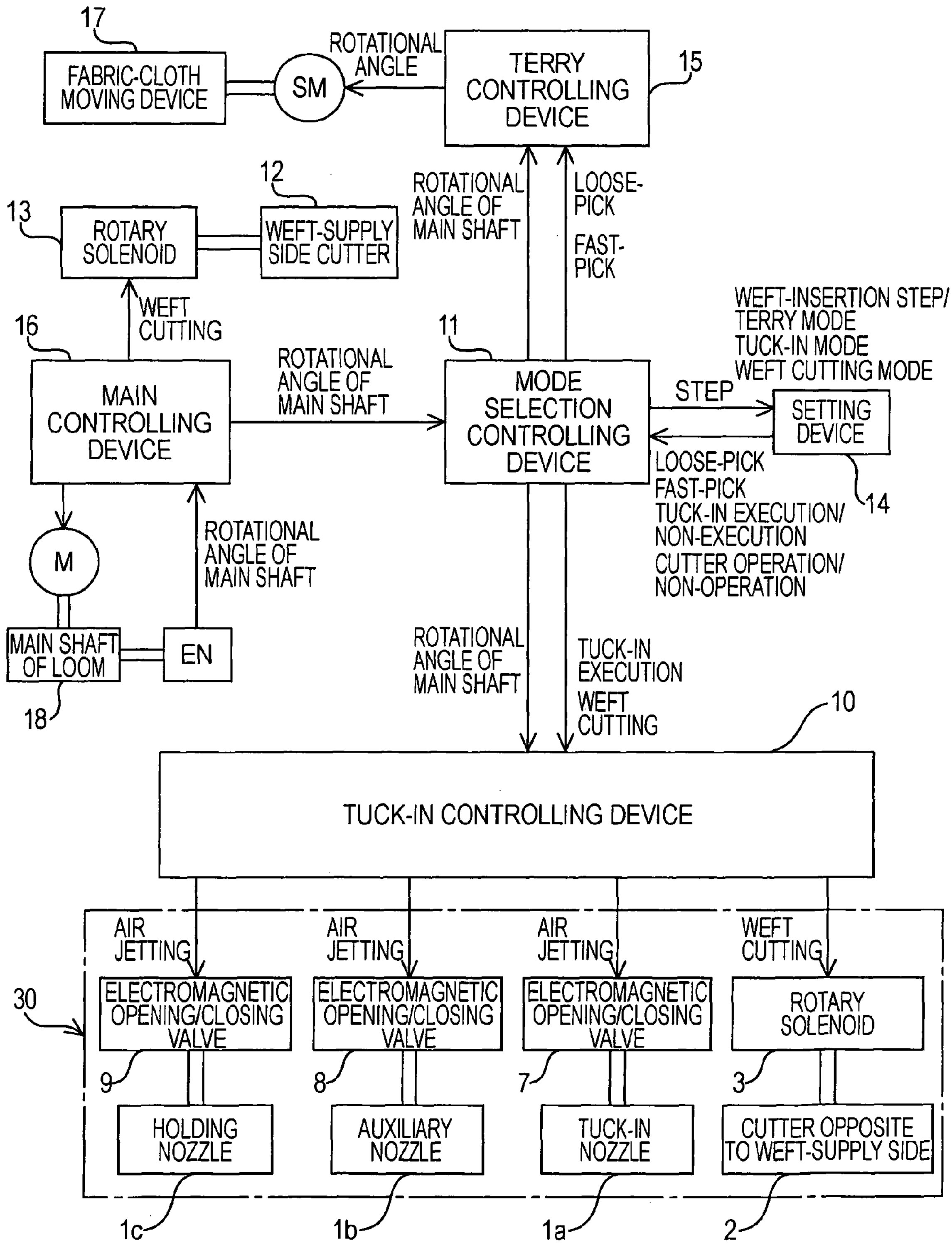
17
FABRIC-CLOTH MOVING DEVICE
SM
ROTATIONAL ANGLE
TERRY CONTROLLING DEVICE
15
12
13
ROTARY SOLENOID
WEFT-SUPPLY SIDE CUTTER
ROTATIONAL ANGLE OF MAIN SHAFT
LOOSE-PICK
FAST-PICK
WEFT CUTTING
16
11
WEFT-INSERTION STEP/
TERRY MODE
TUCK-IN MODE
WEFT CUTTING MODE
MAIN CONTROLLING DEVICE
ROTATIONAL ANGLE OF MAIN SHAFT
MODE SELECTION CONTROLLING DEVICE
STEP
SETTING DEVICE
LOOSE-PICK
FAST-PICK
TUCK-IN EXECUTION/
NON-EXECUTION
CUTTER OPERATION/
NON-OPERATION
14
M
ROTATIONAL ANGLE OF MAIN SHAFT
MAIN SHAFT OF LOOM
EN
18
ROTATIONAL ANGLE OF MAIN SHAFT
TUCK-IN EXECUTION
WEFT CUTTING
10
TUCK-IN CONTROLLING DEVICE
AIR JETTING
AIR JETTING
AIR JETTING
WEFT CUTTING
30
ELECTROMAGNETIC OPENING/CLOSING VALVE
ELECTROMAGNETIC OPENING/CLOSING VALVE
ELECTROMAGNETIC OPENING/CLOSING VALVE
ROTARY SOLENOID
9
8
7
3
HOLDING NOZZLE
AUXILIARY NOZZLE
TUCK-IN NOZZLE
CUTTER OPPOSITE TO WEFT-SUPPLY SIDE
1c
1b
1a
2

FIG. 4

PILE TYPE	TERRY MODE	TUCK-IN MODE (NUMBER OF TUCK-IN WEFT ENDS)						
3 PICK PILE	2L1F		1ST L	2ND L	1ST F			
		No.1	3	—	—			
4 PICK PILE	2L2F		1ST L	2ND L	1ST F	2ND F		
		No.2	1	—	—	3		
	3L1F		1ST L	2ND L	3RD L	1ST F		
		No.3	2	—	2	—		
5 PICK PILE	2L3F		1ST L	2ND L	1ST F	2ND F	3RD F	
		No.4	2	—	—	3	—	
	3L2F		1ST L	2ND L	3RD L	1ST F	2ND F	
		No.5	1	—	2	—	2	
	4L1F		1ST L	2ND L	3RD L	4TH L	1ST F	
		No.6	2	—	—	3	—	
6 PICK PILE	2L4F		1ST L	2ND L	1ST F	2ND F	3RD F	4TH F
		No.7	3	—	—	3	—	—
	3L3F		1ST L	2ND L	3RD L	1ST F	2ND F	3RD F
		No.8	2	—	2	—	2	—
	4L2F		1ST L	2ND L	3RD L	4TH L	1ST F	2ND F
		No.9	3	—	—	3	—	—

FIG. 5

SETTING DEVICE			TERRY CONTROLLING DEVICE	TUCK-IN CONTROLLING DEVICE
CONTROL DATA			CLOTH FELL POSITION WITH RESPECT TO BEATING-UP POSITION	TUCK-IN OPERATION
STEP NUMBER	TERRY MODE	TUCK-IN MODE		
1	2L1F	No.1	WITHDRAW	✓
2				
3			ADVANCE	
4	2L1F	No.1	WITHDRAW	✓
5				
6			ADVANCE	
7	3L2F	No.5	WITHDRAW	✓
8				
9				✓
10			ADVANCE	
11				✓
12	2L1F	No.1	WITHDRAW	✓
13				
14			ADVANCE	
15	3L1F	No.3	WITHDRAW	✓
16				
17				✓
18			ADVANCE	
19	3L1F	No.3	WITHDRAW	✓
20				
21				✓
22			ADVANCE	
23	2L2F	No.2	WITHDRAW	✓
24				
25			ADVANCE	
26				✓
27	2L1F	No.1	WITHDRAW	✓
28				
29			ADVANCE	
30	2L1F	No.1	WITHDRAW	✓
31				
32			ADVANCE	

ONE UNIT OF WEAVING CYCLE

FIG. 6

PILE TYPE	TERRY MODE	TUCK-IN MODE (NUMBER OF TUCK-IN WEFT ENDS)						
3 PICK PILE	2L1F		1ST L	2ND L	1ST F			
		No.1	2	1	—			
		No.2	3	—	—			
4 PICK PILE	2L2F		1ST L	2ND L	1ST F	2ND F		
		No.3	1	1	—	2		
		No.4	1	—	—	3		
	3L1F		1ST L	2ND L	3RD L	1ST F		
		No.5	2	1	1	—		
		No.6	2	—	2	—		
5 PICK PILE	2L3F		1ST L	2ND L	1ST F	2ND F	3RD F	
		No.7	2	1	—	2	—	
		No.8	2	—	—	3	—	
	3L2F		1ST L	2ND L	3RD L	1ST F	2ND F	
		No.9	1	—	2	—	2	
		No.10	3	—	2	—	—	
	4L1F		1ST L	2ND L	3RD L	4TH L	1ST F	
		No.11	2	—	2	1	—	
		No.12	3	—	2	—	—	
6 PICK PILE	2L4F		1ST L	2ND L	1ST F	2ND F	3RD F	4TH F
		No.13	3	1	—	2	—	—
		No.14	3	—	—	3	—	—
	3L3F		1ST L	2ND L	3RD L	1ST F	2ND F	3RD F
		No.15	2	—	2	—	2	—
	4L2F		1ST L	2ND L	3RD L	4TH L	1ST F	2ND F
		No.16	1	—	2	—	—	3
		No.17	3	—	—	3	—	—

FIG. 7

SETTING DEVICE			TERRY CONTROLLING DEVICE	TUCK-IN CONTROLLING DEVICE
CONTROL DATA			CLOTH FELL POSITION WITH RESPECT TO BEATING-UP POSITION	TUCK-IN OPERATION
STEP NUMBER	TERRY MODE	TUCK-IN MODE		
1	2L1F	No.1	WITHDRAW	✓
2				✓
3			ADVANCE	
4	2L1F	No.1	WITHDRAW	✓
5				✓
6			ADVANCE	
7	3L2F	No.9	WITHDRAW	✓
8				
9				✓
10			ADVANCE	
11				✓
12	2L1F	No.2	WITHDRAW	✓
13				
14			ADVANCE	
15	3L1F	No.6	WITHDRAW	✓
16				
17				✓
18			ADVANCE	
19	3L1F	No.6	WITHDRAW	✓
20				
21				✓
22			ADVANCE	
23	2L2F	No.4	WITHDRAW	✓
24				
25			ADVANCE	
26				✓
27	2L1F	No.1	WITHDRAW	✓
28				✓
29			ADVANCE	
30	2L1F	No.1	WITHDRAW	✓
31				✓
32			ADVANCE	

ONE UNIT OF WEAVING CYCLE

FIG. 8

PILE TYPE	TERRY MODE	TUCK-IN MODE (NUMBER OF TUCK-IN WEFT ENDS)						
3 PICK PILE	2L1F		1ST L	2ND L	1ST F			
		No.1	3	——	——			
4 PICK PILE	2L2F		1ST L	2ND L	1ST F	2ND F		
		No.2	1	——	——	3		
		No.3	4	——	——	——		
	3L1F		1ST L	2ND L	3RD L	1ST F		
		No.4	4	——	——	——		
5 PICK PILE	2L3F		1ST L	2ND L	1ST F	2ND F	3RD F	
		No.5	1	——	——	3	1	
		No.6	2	——	——	3	——	
	3L2F		1ST L	2ND L	3RD L	1ST F	2ND F	
		No.7	1	——	——	——	4	
	4L1F		1ST L	2ND L	3RD L	4TH L	1ST F	
		No.8	5	——	——	——	——	
6 PICK PILE	2L4F		1ST L	2ND L	1ST F	2ND F	3RD F	4TH F
		No.9	2	——	——	3	1	——
		No.10	3	——	——	3	——	——
	3L3F		1ST L	2ND L	3RD L	1ST F	2ND F	3RD F
		No.11	1	——	——	——	4	1
		No.12	2	——	——	——	4	——
	4L2F		1ST L	2ND L	3RD L	4TH L	1ST F	2ND F
		No.13	1	——	——	——	——	5

FIG. 9

SETTING DEVICE			TERRY CONTROLLING DEVICE	TUCK-IN CONTROLLING DEVICE
CONTROL DATA			BEATING-UP POSITION WITH RESPECT TO CLOTH FELL POSITION	TUCK-IN OPERATION
STEP NUMBER	TERRY MODE	TUCK-IN MODE		
1	2L2F	No.2	WITHDRAW	✓
2				
3			ADVANCE	
4				✓
5	2L2F	No.2	WITHDRAW	✓
6				
7			ADVANCE	
8				✓
9	2L3F	No.6	WITHDRAW	✓
10				
11			ADVANCE	
12				✓
13				
14	2L3F	No.6	WITHDRAW	✓
15				
16			ADVANCE	
17				✓
18				
19	2L2F	No.3	WITHDRAW	✓
20				
21			ADVANCE	
22				
23	2L3F	No.5	WITHDRAW	✓
24				
25			ADVANCE	
26				✓
27				✓
28	2L2F	No.1	WITHDRAW	✓
29				
30			ADVANCE	
31				✓
32	2L2F	No.1	WITHDRAW	✓
33				
34			ADVANCE	
35				✓

ONE UNIT OF WEAVING CYCLE

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 01 8833

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

D03D

The present search report has been drawn up for all claims

1

Place of search	Date of completion of the search	Examiner
Munich	7 February 2008	Louter, Petrus

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07-02-2008

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