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(54) **UP-AND-DOWN MECHANISM FOR SEPARATED HEALD FRAMES OF A SAMPLE FABRICS MACHINE**

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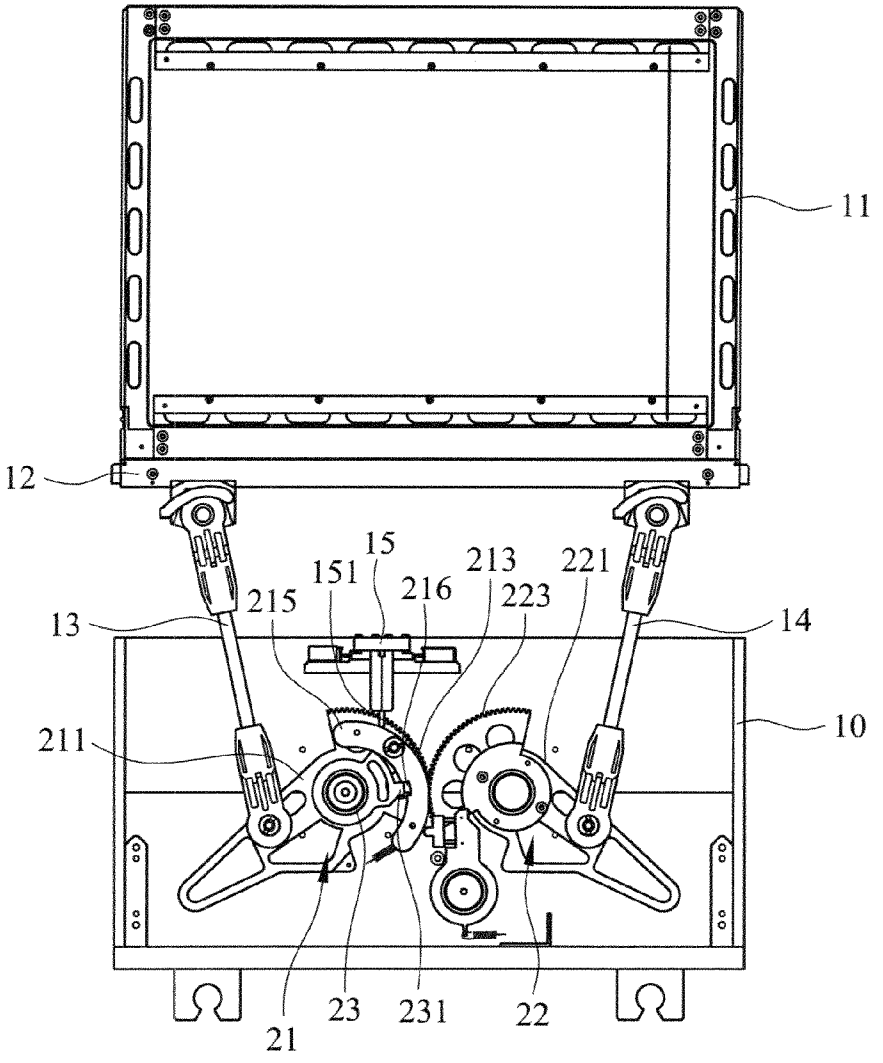
(57) **ABSTRACT**

An up-and-down swing mechanism for separated heald frames of a sample fabrics machine, which includes a plurality of heald frames fitted to a sample fabrics machine. A lower end of each of the heald frames is respectively fitted with a clutch and a swing arm, and controlling a portion of the clutches to engage/separate from the swing arms causes two swing arms to swing/not swing, which then drive a portion of the heald frames to enable up and down swing/no swing thereof through two transmission arms, thereby weaving the required fabric according to the style of sample fabric to be produced.



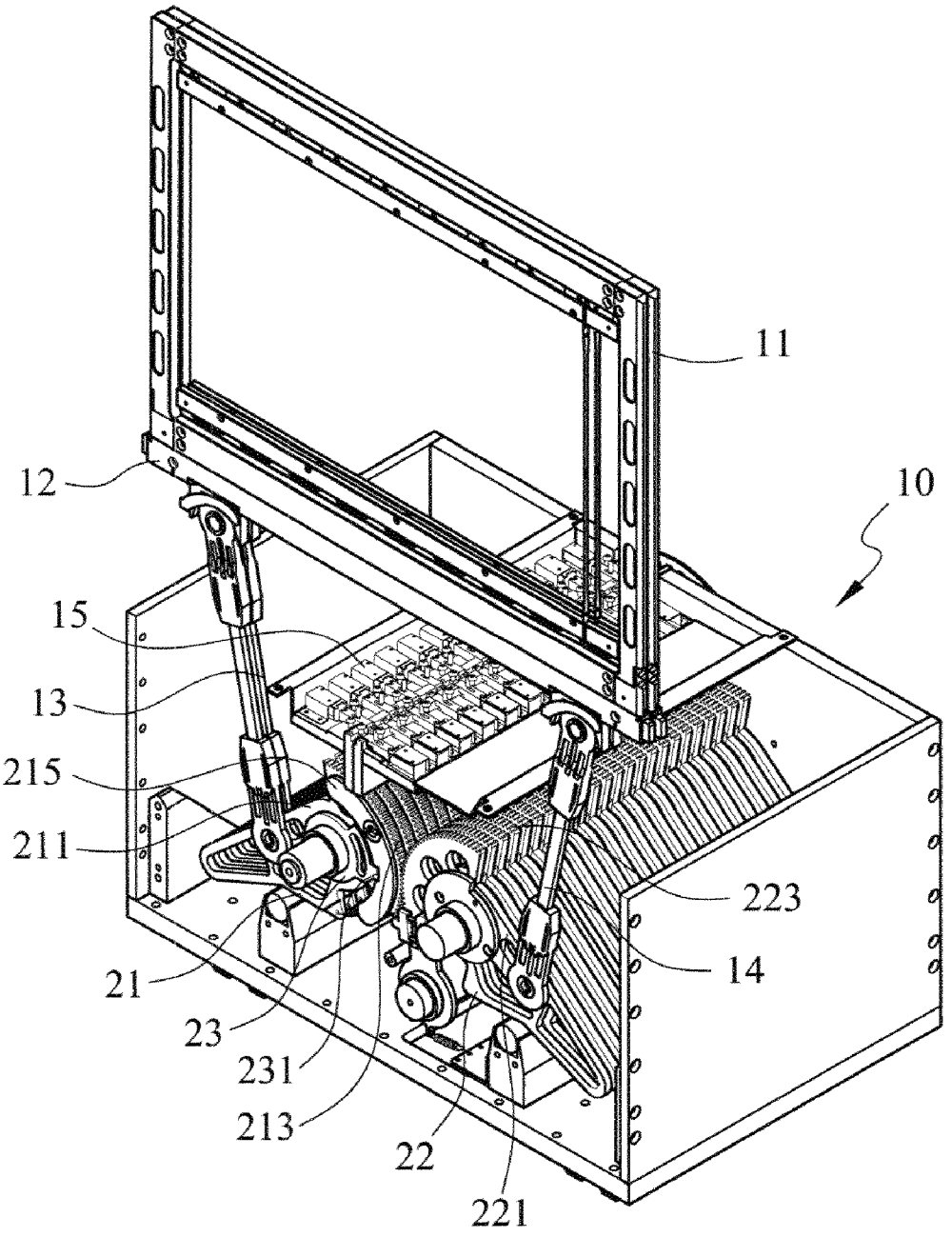


FIG. 1

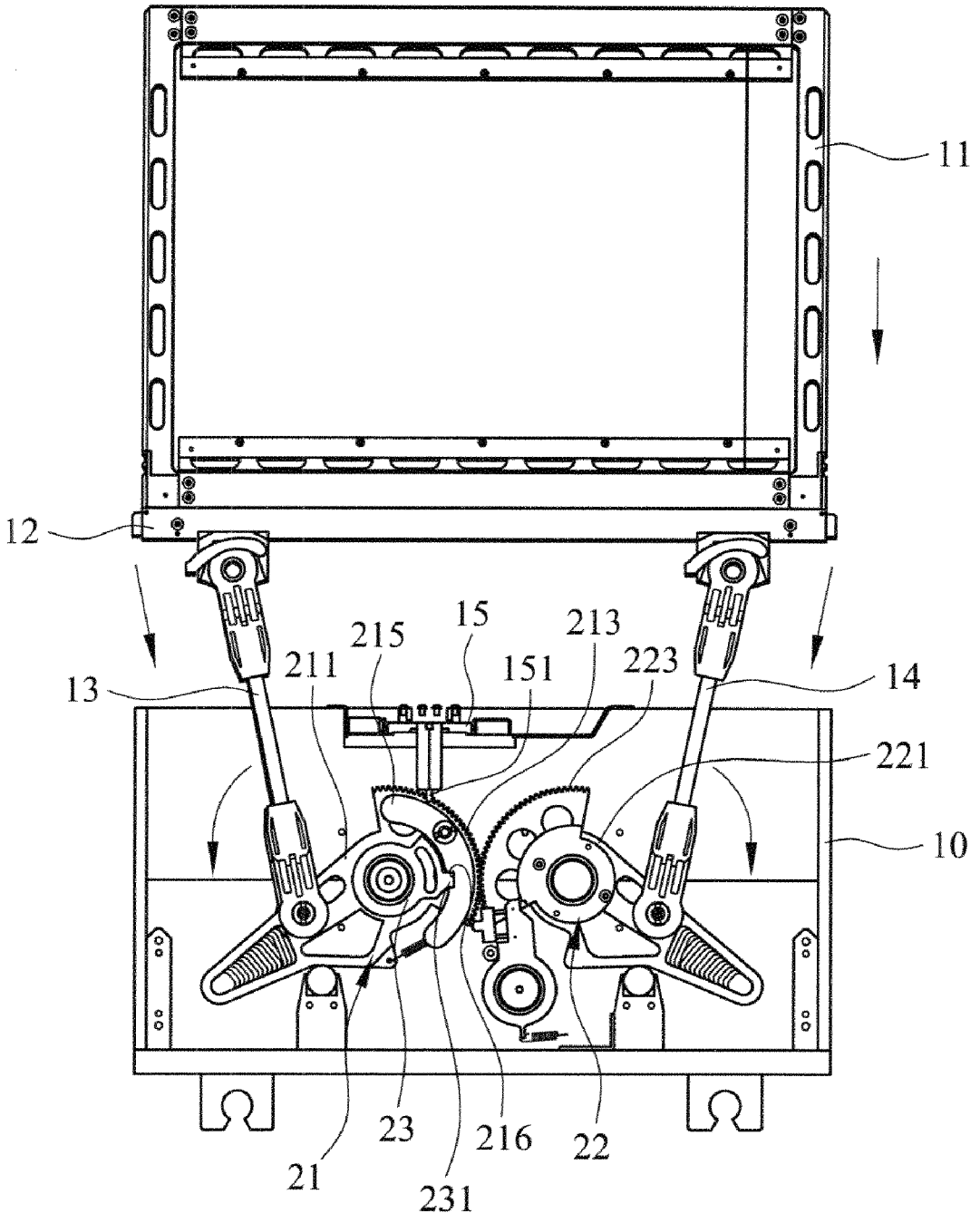


FIG. 2

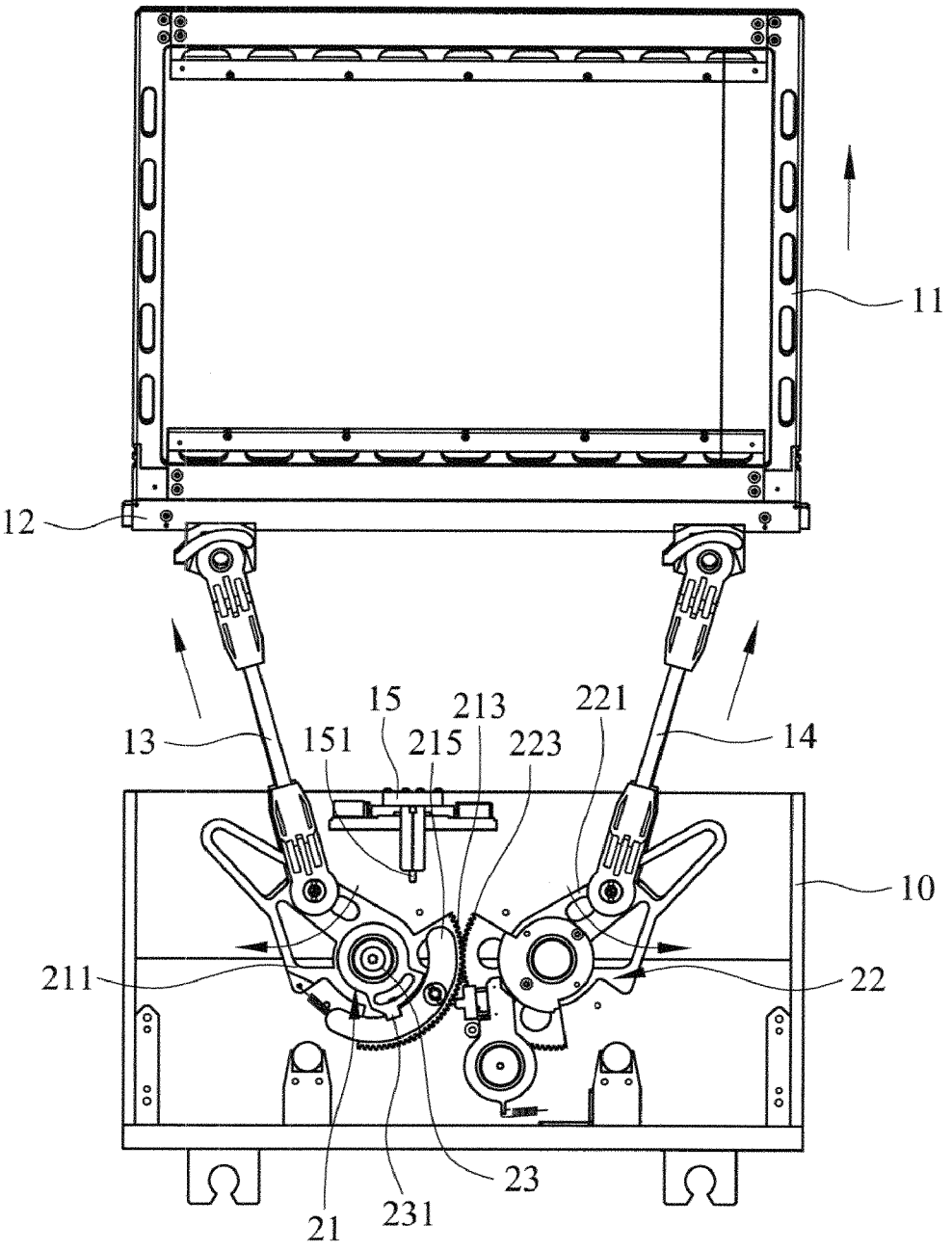


FIG. 3

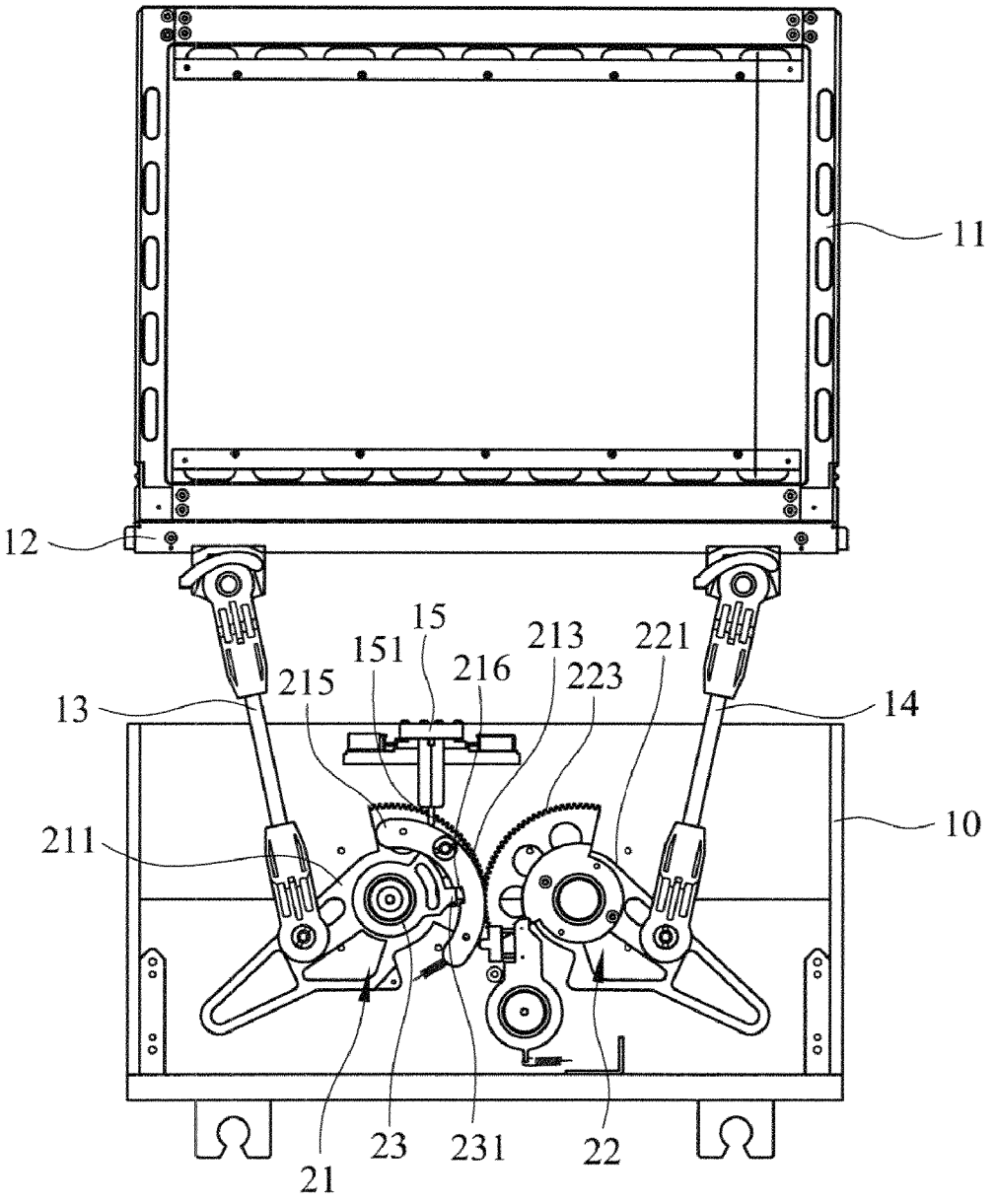


FIG. 4

UP-AND-DOWN MECHANISM FOR SEPARATED HEALD FRAMES OF A SAMPLE FABRICS MACHINE

BACKGROUND OF THE INVENTION

[0001] (a) Field of the Invention

[0002] The present invention relates to an up-and-down swing mechanism for separated heald frames of a sample fabrics machine, and more particularly to a mechanism able to automatically control a portion of heald frames of a sample fabrics machine, and suspend up and down swinging according to the style of sample fabric to be produced.

[0003] (b) Description of the Prior Art

[0004] The rapid development in science and technology has brought about a certain degree of improvement in the quality of life of people, correspondingly, clothing material has tended towards diversification, faster discarding of the old for new, increasing difficulty to pin down demands of different groups of people, and the differentiation between age groups is also becoming more and more indistinct. Under such factors, textile mills (especially those which provide design capability) are all equipped with sample fabrics machines, which are used for design and sample work before mass production of fabrics.

[0005] Sample fabrics machines of the prior art disclose: a base; a plurality of heald frames, the heald frames being installed on the base using separated means, and the heald frames are provided with a plurality of healds, each of the healds being formed with a heald eye, warp threads respectively serially pass through the heald eyes, and different heights between the heald frames are used to separate out a shuttle path between the designated warp threads; a rapier tape chuck, which is provided with a crook, the rapier tape chuck moves back and forth in the shuttle paths, and is used to intercalate cut-off weft thread between the warp threads through the shuttle paths; a color selector device, which is used to feed the designated weft thread to an established region, and clutching of the weft thread of the established region by the rapier tape chuck is used to intercalate the weft thread, after being cut-off, between the warp threads through the shuttle paths; a weft cutting device, which moves back and forth in the established region, the weft cutting device being used to implement cutting of the clutched weft thread carried by the rapier tape chuck through the established region; a steel reed, which is pin connected to the base, the steel reed being provided with a plurality of reeds, the warp threads pass through between the reeds, and the steel reed is used to push the clutched weft thread carried by the rapier tape chuck in the direction of the shuttle path, thereby causing the weft threads passing between the warp threads to be mutually contiguous with each other.

[0006] However, although the sample fabrics machines of the prior art are able to automatically weave sample fabrics, nevertheless, the heald frames use pneumatic cylinders to push upwards and downwards to effect up and down swinging, and the pneumatic cylinders using gas thrust as its power source results in slow movement response of the up and down swinging of the heald frames. Hence, the up and down strokes cannot be finely adjusted, making fine control difficult. Moreover, gas thrust produces a large amount of noise, and is thus considerably inconvenient in use.

SUMMARY OF THE INVENTION

[0007] Hence, in light of the shortcomings of the aforementioned prior art, the inventor of the present invention, having accumulated knowhow and manufacturing experience of a diverse range of sample fabrics machines, attentively researched various methods to resolve the shortcomings, which, following continuous research and improvements, culminated in the design of a completely new up-and-down swing mechanism for separated heald frames of a sample fabrics machine.

[0008] The objective of the present invention is to provide an up-and-down swing mechanism for separated heald frames of a sample fabrics machine able to suspend up and down swinging of a portion of heald frames using separated means.

[0009] According to the aforementioned objective, the up-and-down swing mechanism for separated heald frames of a sample fabrics machine comprises a plurality of regular arranged heald frames fitted to a sample fabrics machine, wherein a lower end each of the heald frames is connect to a fixed plate, and transmission arms are respectively pivotal located on two sides of a lower end of each of the fixed plates. A master drive and a slave drive are respectively fitted within the sample fabrics machine corresponding to positions of the two transmission arms. The master drive is driven by a power device (such as: a servomotor), a swing arm is pivotal located to the master drive, and a clutch is located between the power device and the swing arm, thereby enabling the clutch to engage with the swing arm or separate from the swing arm to cause up and down swing or no swing thereof. Another swing arm is fitted to the slave drive, and semicircular rows of teeth are respectively located on corresponding ends of the two swing arms. The two rows of teeth are disposed to mutually engage, thus, when the swing arm swings, the other swing arm is actuated and swings in synchronization therewith. Furthermore, the upper end of one of the transmission arms is pin connected to one side of the lower end of the fixed plate, and the lower end is pin connected to the other end of the swing arm relative to the row of teeth, while the upper end of the other transmission arm is pin connected to the other side of the lower end of the fixed plate, and the lower end is pin connected to the other end of the other swing arm relative to the row of teeth. When in use, according to the style of sample fabric to be produced, controlling a portion of the clutches to engage or separate from the swing arms causes the two swing arms to swing or not swing, which then drives a portion of the heald frames to cause up and down swing or no swing thereof through the two transmission arms, thereby weaving the required style of fabric.

[0010] To enable a further understanding of said objectives and the technological methods of the invention herein, a brief description of the drawings is provided below followed by a detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is an external elevational view of an up-and-down swing mechanism for separated heald frames of a sample fabrics machine of the present invention.

[0012] FIG. **2** is a schematic view depicting an up-and-down swing of the up-and-down swing mechanism for separated heald frames of a sample fabrics machine of the present invention.

[0013] FIG. **3** is another schematic view depicting another up-and-down swing of the up-and-down swing mechanism for separated heald frames of a sample fabrics machine of the present invention.

[0014] FIG. **4** is a schematic view depicting clutch operation of the up-and-down swing mechanism for separated heald frames of a sample fabrics machine of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] The present invention relates to an up-and-down swing mechanism for separated heald frames of a sample fabrics machine. Referring to FIGS. **1**, **2** and **3**, which show an up-and-down swing mechanism for separated heald frames of a sample fabrics machine of the present invention, wherein a plurality of regularly arranged heald frames **11** are fitted to a sample fabrics machine **10**, a lower end of each of the heald frames **11** is connected to a fixed plate **12**, and transmission arms **13**, **14** are respectively pivotal located on two sides of a lower end of each of the fixed plates **12**.

[0016] A master drive **21** and a slave drive **22** are respectively fitted within the sample fabrics machine **10** corresponding to positions of the two transmission arms **13**, **14**. The master drive **21** is driven by a power device (such as: a servomotor) (not shown in the drawings), a swing arm **211** is pivotal located to the master drive **21**, and a clutch **23** is located between the power device and the swing arm **211**, thereby enabling the clutch **23** to engage with the swing arm **211** or separate from the swing arm **211** to produce up and down swing or no swing thereof.

[0017] Another swing arm **221** is fitted to the slave drive **22**, and semicircular rows of teeth **213**, **223** are located on corresponding ends of the two swing arms **211**, **221** respectively. The two rows of teeth **213**, **223** are disposed to mutually engage, thus, when the swing arm **211** swings, the other swing arm **221** is actuated and swings in synchronization therewith. Furthermore, the upper end of the transmission arm **13** is pin connected to one side of the lower end of the fixed plate **12**, and the lower end is pin connected to the other end of the swing arm **211** relative to the row of teeth **213**, while the upper end of the other transmission arm **14** is pin connected to the other side of the lower end of the fixed plate **12**, and the lower end is pin connected to the other end of the other swing arm **221** relative to the row of teeth **223**.

[0018] Hence, according to the style of sample fabric to be produced, controlling a portion of the clutches **23** to engage or separate from the swing arms **211** within a period of time (as depicted in FIGS. **2**, **4**) causes the two swing arms **211**, **221** to swing or not swing, which then drives a portion of the heald frames **11** to cause up and down swing or no swing thereof through the two transmission arms **13**, **14** within a period of time, thereby weaving the required style of fabric.

[0019] Referring again to FIGS. **1**, **2** and **3** together with FIG. **4**, each of the clutches **23** is connected to the power device, thereby enabling the power device to drive each of the clutches **23** in synchronous rotation. A protruding piece **231** is located on each of the clutches **23**, a circular arc-shaped fixed plate **215** is pivotal located on the swing arms **211** corresponding to the positions of the protruding pieces **231**, and a clasp groove **216** is provided on an inner side of the fixed plates **215** to correspond with the protruding pieces **231**, thereby enabling the protruding pieces **231** to insert into the clasp grooves **216**. Hence, when the power device drives the clutches **23** to effect synchronous rotation thereof, then the protruding pieces **231** inserting into the clasp grooves **216** enable the power device to indirectly drive the swing arms **211** and cause up and down swing thereof.

[0020] Referring again to FIGS. **1**, **2**, **3** and **4**, a selector **15** is located on the sample fabrics machine **10** corresponding to the position of the fixed plate **215** of each of the swing arms **211**, and a push rod **151** is located on each of the selectors **15** above each of the fixed plates **215**. The selectors **15** are electrically connected to a control circuit (not shown in the drawings) of the sample fabrics machine **10**, and the selectors **15** are controlled by the circuit control, thereby enabling the control circuit to control the selectors **15** to extend downward a portion of the push rods **151** within a period of time according to a set program, and thus cause the push rods **151** to actuate and move the fixed plates **215** and induce the protruding pieces **231** of the clutches **23** to separate from the clasp grooves **216** of the fixed plates **215**, thereby causing the clutches **23** to run idle and be unable to drive the swing arms **211** and effect up and down swing thereof, which causes the swing arms **211** to stop swinging within that period of time, and simultaneously suspends up and down swinging of the corresponding heald frames **11**. Accordingly, controlling suspension of up and down swinging of a portion of the heald frames **11** is used to enable the required fabric to be woven.

[0021] In conclusion, the up-and-down swing mechanism for separated heald frames of a sample fabrics machine of the present invention is assuredly provided with an innovative structure not found in the prior art. Moreover, no similar products have been seen in any publication or in the market; the present invention is thus provided with undoubted originality. In addition, the present invention is provided with unique characteristics and functionality that are without comparison in the prior art. Hence, the incomparable advancement of the present invention clearly complies with the essential elements as required for a new patent application. Accordingly, a new patent application is proposed herein.

[0022] It is of course to be understood that the embodiments described herein are merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. An up-and-down swing mechanism for separated heald frames of a sample fabrics machine, comprising:

a plurality of heald frames fitted to a sample fabrics machine, a lower end of each of the heald frames is connected to a fixed plate, and two sides of the lower end of each of the fixed plates are respectively pivotal located to a transmission arm;

a master drive, the master drive is fitted within the sample fabrics machine corresponding to positions of the two transmission arms, the master drive is driven by a power device, a swing arm is pivotal located to the master drive, and a clutch is located between the power device and the swing arm, thereby enabling the clutch to engage with or separate from the swing arm to cause up and down swing or no swing thereof,

a slave drive, the slave drive is fitted within the sample fabrics machine juxtaposed to one side of the master drive, another swing arm is fitted to the slave drive, and semicircular rows of teeth are respectively located on corresponding ends of the swing arm and the other swing arm, the two rows of teeth are disposed to mutually engage, thus, when the swing arm swings, then the other swing arm is actuated and swings in synchronization therewith; furthermore, the upper end of one of the

transmission arms is pin connected to one side of the lower end of the fixed plate, and the lower end is pin connected to the other end of the swing arm relative to the row of teeth, while the upper end of the other transmission arm is pin connected to the other side of the lower end of the fixed plate, and the lower end is pin connected to the other end of the other swing arm relative to the row of teeth,

whereby, according to the style of sample fabric to be produced, controlling a portion of the clutches to engage or separate from the swing arms within a period of time causes the two swing arms to swing or not swing, which then drives a portion of the heald frames to cause up and down swing or no swing thereof through the two transmission arms within a period of time, thereby weaving the required style of fabric.

2. The up-and-down swing mechanism for separated heald frames of a sample fabrics machine according to claim **1**, wherein the power device is a servomotor.

3. The up-and-down swing mechanism for separated heald frames of a sample fabrics machine according to claim **1**, wherein each of the clutches is connected to the power device, thereby enabling the power device to drive each of the clutches in synchronous rotation, a protruding piece is located on each of the clutches, and a circular arc-shaped fixed plate is pivotal located on the swing arms corresponding to the positions of the protruding pieces, and a clasp groove is provided on an inner side of the fixed plates to correspond with the protruding pieces, thereby enabling the protruding pieces to insert into the clasp grooves, whereby, when the power device drives the clutches to effect synchronous rotation thereof, then the protruding pieces inserting into the clasp grooves enable the power device to indirectly drive the swing arms and cause up and down swing thereof.

4. The up-and-down swing mechanism for separated heald frames of a sample fabrics machine according to claim **3**, wherein a selector is located on the sample fabrics machine corresponding to the position of the fixed plate of each of the swing arms, and a push rod is located on each of the selectors above each of the fixed plates, the selectors are electrically connected to a control circuit of the sample fabrics machine, and the selectors being controlled by the circuit control enables controlling a portion of the push rods of the selectors to extend downward within a period of time according to a set program, thereby causing the push rods to actuate and move the fixed plates and induce the protruding pieces of the clutches to separate from the clasp grooves of the fixed plates, thus causing the clutches to run idle and be unable to drive the swing arms and effect up and down swing thereof, whereupon the swing arms stop swinging within that period of time, while at the same time suspending up and down swinging of the corresponding heald frames.

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