ABSTRACT

The balance training apparatus includes a baseboard and a left-and-right swing module is connected between the front and rear sides of the baseboard. The left-and-right swing module has a driving mechanism pivotally connected to a back-and-forth slide and swing module for driving a back-and-forth slide and swing module to produce back-and-forth slides and up-and-down swings with respect to the left-and-right swing module. A driving mechanism drives an eccentric shaft through a transmission disc, and another end of the spindle eccentric shaft is pivotally connected to a link board module of the base module. The motor drives the eccentric shaft to produce left and right tilted swings to the left-and-right swing module baseboard. An adjusting device is installed between the baseboard of the left-and-right swing module and the back-and-forth slide and swing module for driving the back-and-forth slide and swing module to displace back and forth on the baseboard.
(A) FIG. 6

(B) FIG. 6
using an exercise apparatus A driven by a driving mechanism installed on the exercise apparatus A for training a human body

pre-installing a program and a circuit in the exercise apparatus A and driving a second slide base and a swing stand of a back-and-forth slide and swing module to swing back and forth or up and down with respect to a base module; or working together with an adjusting mechanism to adjust the back-and-forth slide and swing module to displace horizontally on the baseboard of the base module to change the swinging amplitude of the back-and-forth slide and the swing module

setting the driving mechanism to simultaneously rotate the transmission disc driving module and drive the transmission disc and its pivotally connected eccentric protruding pillar to link the guide pin base, and also pull a baseboard of the left-and-right swing module and use the pivotal connecting point of the base module as a center to produce left, right and tilted swings

obtaining a multidirectional balance training apparatus A for slide and swing exercises

FIG. 8
(A) FIG. 10

(B) FIG. 10
FIG. 14

(A)

FIG. 14

(B)

FIG. 14

(C)

FIG. 14
BALANCE TRAINING APPARATUS FOR SLIDE AND SWING EXERCISE AND METHOD

FIELD OF THE INVENTION

The present invention relates to a balance training apparatus for slide and swing exercises and a method thereof, and more particularly to a balance training apparatus having a driving mechanism for driving a swing stand to simultaneously produce back-and-forth slides and up-and-down and right-and-left swings and an adjusting mechanism for changing the swing amplitude of a slide and swing module to provide the effects of slides and swings in different directions.

BACKGROUND OF THE INVENTION

Referring to FIGS. 18A and 18B for a conventional swing apparatus for balance training, a bottom panel 70 includes corresponding first, second, third and fourth sideboards 71, 72, 73, 74, an upper lid 75 connected to the top of each sideboard 71, 72, 73, 74, and a plurality of axial holes disposed on the third and fourth sideboards 73, 74 for passing first and second output shafts 82, 83 respectively. The bottom panel 70 has a motor module 80, and a worm 81 fixed at the axle rod, such that the worm 81 is engaged with a bevel gear 831 of the second output shaft 83. An end of the second output shaft 83 has a gear 832 engaged with a bevel gear 821 of the first output shaft 82, and another end of the first output shaft 82 has an eccentric piller 822 protruded from the fourth sideboard 74 and connected to a rod end bearing 823. Another end of the rod end bearing 823 is pivotally connected to the bottom of the fourth sideboard 74, and an end of the second output shaft 83 is protruded from the third sideboard 73 and pivotally connected to an eccentric member 833. Another end of the eccentric member 833 is pivotally connected to a driving member 834, such that the driving member 834 is pivotally connected to a wall of the second sideboard 72.

Referring to FIG. 19A, the motor 80 is turned on to drive a worm 81 to rotate and a bevel gear 831 and a gear 832 of the second output shaft 83, and drive the bevel gear 821 at the first output shaft 82 to rotate the second output shaft 83, and drive the driving member 834 to move back and forth, so that the first and second sideboards 71, 72 produce displacements with respect to the bottom panel 70. Referring to FIG. 19B, the first output shaft 82 is rotated to drive the rod end bearing 823, such that the rod end bearing 823 drives the fourth sideboard 74 at the same time to produce displacements for the third and fourth sideboards 73, 74 with respect to the bottom panel 70. With the operation of the foregoing components, the upper lid 75 can be swung in different directions such as back-and-forth and up-and-down directions with respect to the bottom panel 70.

SUMMARY OF THE INVENTION

In view of the shortcomings of the prior art, the inventor of the present invention based on years of experience in the fitness equipment related industry to conduct extensive researches and experiments, and finally invented a balance training apparatus for slide and swing exercises.

The balance training apparatus for slide and swing exercises in accordance with the invention comprises a base module, a left-and-right swing module, a driving mechanism and a back-and-forth slide and swing module. Both front and rear sides of the base module are pivotally connected to a left-and-right swing module, and the left-and-right swing module has a driving mechanism, and the left-and-right swing module baseboard is pivotally connected to a back-and-forth slide and swing module. The driving mechanism comprises a motor, a decelerating mechanism, a transmission disc driving module and a plurality of driving members. The axle center of the decelerating mechanism is sheathed together with a transmission disc driving module by a transmission shaft, such that both ends of the transmission shaft are pivotally connected to a slide and swing rail stand on the back-and-forth slide and swing module by the plurality of driving members, and the axle center of the transmission disc driven by the transmission disc driving module is sheathed with an eccentric shaft, so that another end of the pivotal shaft is pivotally connected to a link board module of the base module. By the operation of the driving mechanism, the back-and-forth slide and swing module is driven to produce back-and-forth slides and up-and-down swings with respect to the left-and-right swing module. By the rotation of the transmission disc, the eccentric shaft is moved with respect to the link board module, such that the left-and-right swing module baseboard uses the pivotal connecting point of the base module as the center to produce left, right and oblique swings. Both semicircular hole and protruding pillar work together to convert the status of the left-and-right swing inclined towards the front into the back-and-forth swing inclined towards the rear, when the driving mechanism is rotated in a reverse direction, so as to form a multidirectional slide and swing exercise apparatus and simulate different slide and swing situations to give more fun to the exercises.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a balance training apparatus of the present invention;
FIG. 2 is an exploded view of a back-and-forth slide and swing module and a left-and-right swing module of a balance training apparatus of the present invention;
FIG. 3 is an exploded view of a left-and-right swing module and a base module of a balance training apparatus of the present invention;
FIGS. 3A and 3B are schematic views of a transmission disc and an eccentric protruding pillar of a balance training apparatus of the present invention;
FIGS. 4A–4D are side views of movements of a back-and-forth slide and swing module of a balance training apparatus of the present invention;
FIG. 5 is a front view of a left-and-right swing module of a balance training apparatus of the present invention;
FIGS. 5B and 5C are front views of left and right swings and tilts of a balance training apparatus of the present invention;
FIGS. 6A and 6B are top views of swing and slide movements of a balance training apparatus of the present invention;
FIGS. 6C and 6D are top views of slide and swing movements of a driving mechanism of a balance training apparatus of the present invention when it is rotated in a reverse direction.
FIGS. 7A and 7B are schematic views of slide and swing movements of a balance training apparatus of the present invention;

FIG. 8 is a flow chart of an exercise method of a balance training apparatus of the present invention;

FIGS. 9A and 9B are schematic views of movements of an adjusting mechanism of the present invention;

FIGS. 10A and 10B are schematic views of a balance training apparatus of the present invention;

FIG. 11 is a schematic view of a first preferred embodiment of the present invention;

FIG. 12 is a schematic view of a second preferred embodiment of the present invention;

FIG. 13 is a schematic view of a third preferred embodiment of the present invention;

FIGS. 14A-14C are schematic views of installing an eccentric protruding pillar into a pivotal hole of a driving member in accordance with a third preferred embodiment of the present invention;

FIGS. 15A-15D are top views of movements in accordance with a third preferred embodiment of the present invention;

FIG. 16A and 16B are top views of two swing stands being crossed with each other in accordance with a third preferred embodiment of the present invention;

FIG. 17 is a schematic view of a balance training apparatus used for snow skiing in accordance with the present invention;

FIGS. 18A and 18B are exploded views of a conventional swing apparatus;

FIGS. 19A and 19B are schematic views of movements of a conventional swing apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1, 2A and 2B for a balance training apparatus for slide and swing exercises and its method in accordance with the present invention, the apparatus comprises the following elements:

A base module 10 has a basic stand 11, two connecting board modules 12 disposed on both sides of the basic stand 11 and pivotally connected to a left-and-right swing module 20, a link board module 13 disposed on a side of the basic stand 11 and having a pivotal ear base 14, and a guide pin base 15 pivotally connected to the pivotal ear base 14 and having a transversal guide slot 16.

A left-and-right swing module 20 has a plurality of pivotal connecting boards and a driving mechanism 30 disposed on a baseboard 21, and a groove hole 25 disposed between the baseboard 21 and the pivotal board 23 for passing the base module 10.

A driving mechanism 30 pre-installs a program and a circuit for controlling and driving and the driving mechanism 30 comprises a motor 31, a decelerating mechanism 32, a transmission disc driving module 34 and a plurality of driving members 37. The decelerating mechanism 32 is driven by the motor 31, and the axle center of the decelerating mechanism 32 is sheathed with a transmission disc driving module 34 by a transmission shaft 33, and the periphery of the transmission disc driving module 34 has a plurality of equidistant protruding poker 341, and the periphery of the transmission disc 35 has a plurality of equidistant serrated grooves 351, and a stopping member 353 disposed at the axle hole 352 and having a semicircular hole to form a semicircular axle hole 352, and the poking rod 341 of the transmission disc driving module 34 and the serrated groove 351 of the transmission disc 35 are installed with a ratio of 1:2. A pivotal axle 36 is pivotally connected and fixed onto the pivotal board 23 of the baseboard 21, and an end of the pivotal axle 36 has a quarter circular eccentric protruding pillar 361 such that the quarter circular protruding pillar 361 is embedded into an axle hole 352 of the transmission disc 35, and another end of the pivotal axle 36 has an eccentric axle rod 362, such that the eccentric axle rod 362 can be extended correspondingly into the guide slot 16 of the guide pin base 15 of the link board 13.

An adjusting mechanism 40 pre-installs a program and a circuit for controlling and driving, and the adjusting mechanism 40 has a motor 41 installed at a side of the baseboard 21 and latched and connected by an axle rod 411 of the decelerating mechanism 412 and a horizontal screw rod 42, and another end of the horizontal screw rod 42 is pivotally connected to the pivotal board 24.

A back-and-forth slide and swing module 50 is pivotally connected by a plurality of board stands, and the first slide base 51 is comprised of front and rear frames 52 and a middle board module 53, and both left and right sides of the front and rear frames 52 separately have a rail 521. The first slide base 51 is pivotally connected to the rails 521 on the front and rear frames 52 through two corresponding pivotal bases 22 of the left-and-right swing module baseboard 21 for pivotally installing the first slide base 51 on the left-and-right swing module 20, and embedding two sideboards 531 of the middle board 53 into the lathe grooves 541 on both sides of a driving member 54, and sheathing the driving member 54 on a screw rod 42 of an adjusting mechanism 40. The top of the first slide base 51 is connected to a pivotal connecting point 562 of a second slide base 55 through a board stand, and the second slide base 55 is comprised of a slide and swing rail stand 56, and both left and right sides of the slide and swing rail stand 56 also have a rail 561 separately. A swing stand 57 is a rectangular frame having a support board 571 extended from the bottom of the periphery of the swing stand 57 for pivotally connecting each support board 571 to the second slide base 55 and each rail 561 of the slide and swing rail stand 56. A driving member 37 is pivotally connected to a pivotal connecting position 572 on the right side proximate to two support boards 571 of the driving mechanism 30, and the driving member 37 is a rectangular member with an end having an axial hole 371 pivotally connected to the support board 571 and a pivotal connecting position 572 of the slide base rail 561, and another end having a pivotal hole 372 for passing and fixing the transmission shaft 33.

Referring to FIG. 4A for a side view of the original status of a training apparatus A of the present invention, if the motor 31 of the driving mechanism 30 is driven by the decelerating mechanism 32 to rotate the transmission shaft 33 clockwise, the driving member 37 is rotated to drive the second slide base 55 and the swing stand 57 to slide back and forth and swing up and down. If the transmission shaft 33 drives the driving member 37 to deflect to the position of Point a (as shown in FIG. 4B), then the second slide base 55 and the swing stand 57 will slide and swing to a tilted position with the front side lower than the rear side. If the
driving member 37 is deflected to the position of Point b (as shown in FIG. 4C), the second slide base 55 and the swing stand 57 will slide and swing back to its horizontal position. The driving member 37 continues to deflect to the position of Point c (as shown in FIG. 4D), the second slide base 55 and the swing stand 57 will slide and swing to a tilted position with the front side higher than the rear side. If the driving member 37 continues its rotation and returns to the position of the original point o (as shown in FIG. 4A), then the second slide base 55 and the swing stand 57 will slide and swing back to their original positions at the same time. With the aforementioned slide and swing movements, the second slide base 55 and the swing stand 57 simultaneously produce slide and swing movements with respect to the base module 10.

[0035] Referring to FIGS. 5A–5C for schematic views of left and right tilted movements of a training apparatus A, the motor 31 is driven by the decelerating mechanism 32 to rotate the transmission shaft 33 and the transmission disc driving module 34, and the transmission disc 35 is driven to rotate. Since the number of poking rods 341 of the transmission disc driving module and the number of serrated groove 351 of the transmission disc are installed in the ratio of 1:2, therefore the transmission disc 35 will turn one round when the transmission disc driving module 34 turns two rounds (or the motor 31 is driven by the decelerating mechanism 32 to rotate the transmission shaft 33 for two rounds), such that the eccentric protruding pillar 361 pivotally connected to the semicircular axle hole 352 of the transmission disc 35 will drive the axle rod 362 of the pivotal axle 36 to rotate in the transversal guide slot 16 of the guide pin base 15, so as to drive the guide pin base 15 to turn pivotally, and the baseboard 21 is pushed and the pivotal connecting point of the connecting board 12 of the base module 10 is used as a center to produce left and right tilted swings.

[0036] Referring to FIGS. 6A–6D for top views of a training apparatus of the present invention, if the transmission shaft 33 turns one round clockwise, the swing stand 57 will slide and swing towards the left corner of the original position with respect to the pivotal connection of the left-and-right swing module 20 (not shown in the figure) and the base module 10, and then the swing stand 57 will slide and swing back to the original position. If the transmission shaft 33 turns another round clockwise, the swing stand 57 will slide and swing towards the right corner with respect to the pivot connection. If the motor 31 is driven by the decelerating mechanism 32 to turn the transmission shaft 33 counterclockwise, the transmission disc 35 will turn 90 degrees counterclockwise, such that the quarterly circular eccentric protruding pillar 361 of the transmission shaft 33 can be embedded and latched into another side of the semicircular axle hole 352 of the transmission disc 35 (as shown in FIG. 3B), and the wall of the semicircular axle hole 352 of the transmission disc 35 is pressed to rotate the eccentric protruding pillar 361. If the transmission shaft 33 turns one round clockwise, the swing stand 57 will slide and swing to the original position towards the left rear corner of the pivotal connection of the left-and-right swing module 20 and the base module 10, and then will slide and swing back to the original position (as shown in FIG. 6). If the transmission shaft 33 turns one round counterclockwise, the swing stand 57 will slide and swing towards the right rear corner with respect to the left-and-right swing module 20 and the base module 10, and finally will swing and slide back to the original position (as shown in FIG. 6D), so as to form a multidirectional balance training apparatus A for slide and swing exercises. Referring to FIGS. 7A and 7B for schematic views of movements of a balance training apparatus for slide and swing exercises in accordance with the present invention, and FIG. 8 for a flow chart of movements of a balance training apparatus for slide and swing exercises in accordance with the present invention, the method comprises the following steps:

[0037] (a) using an exercise apparatus A driven by a driving mechanism 30 installed on the exercise apparatus A for training a human body;

[0038] (b) pre-installing a program and a circuit in the exercise apparatus A, such that the motor 31 of the driving mechanism 30 drives the transmission shaft 33 to rotate counterclockwise, while driving a second slide base 55 and a swing stand 57 of a back-and-forth slide and swing module 50 to swing back and forth or up and down with respect to a base module 10; or working together with an adjusting mechanism to adjust the back-and-forth slide and swing module 50 to displace horizontally on the baseboard of the base module to change the swinging amplitude of the back-and-forth slide and the swing module;

[0039] (c) setting the driving mechanism 30 to simultaneously rotate the transmission disc driving module 34 and drive the transmission disc 35 and its pivotally connected eccentric protruding pillar 361 to link the guide pin base 15, and also pull a baseboard 21 of the left-and-right swing module 20 and use the pivotal connecting point of the base module 10 as a center to produce left, right and tilted swings; so as to form a multidirectional balance training apparatus A for slide and swing exercises.

[0040] Referring to FIGS. 9A and 9B, the driving member 54 is fixed onto a middle board module 53 of the first slide base 51, such that the driving member 54 can be operated by the motor 41 of the adjusting mechanism 40 and driven by the decelerating mechanism 412 to rotate the screw rod 42, and the driving member 54 can be displaced back and forth on the screw rod 42 to displace the first and second slide bases 51, 55 with respect to the baseboard 21. Since the swing stand 57 is pivotally connected to the driving mechanism 30, therefore the swing stand 57 will not be driven by the driving member 54 to displace. Referring to FIGS. 10A and 10B, it is known from the principle of lever that if a fulcrum is situated at the center, both front and rear ends of the rod are maintained in equilibrium; if the first and second slide bases 51, 55 are shifted to an appropriate distance to the rear or the position of the pivotal connecting point 562 (which is the fulcrum) is shifted to a position 562' that approaches the pivotal connecting position 572 of the driving mechanism 30 and the swing stand 57, the rear rod section at the fulcrum 562' of the second slide base 55 will become longer, and the front rod section at the fulcrum 562' of the second slide base 55 will become shorter. If the driving mechanism 30 drives the front shorter rod section to swing to a swing distance d1 at a swing angle a1, the longer rear rod section will pivotally turn and swing with an angle b1 to produce a larger swing distance d2. On the other hand, if the first and second slide bases 51, 55 are adjusted to displace to an appropriate distance backward, the front rod section at the fulcrum 562' of the second slide base 55 will become longer and the rear rod section will become shorter.
If the driving mechanism 30 drives the long rod section to swing with an angle $\alpha_2$, the swing distance is equal to $d_1$, and the swing angle of the short rod section will pivotally turn or rotate with a small angle $\beta_2$ only, so as to decrease the amplitude, and the deflected distance is equal to $d_3$ to define an adjusting mechanism 40 capable of adjusting the swing amplitude.

[0041] Referring to FIG. 11 for a first preferred embodiment of the present invention, an external casing base 60 is disposed on the exercise apparatus A, and a saddle seat 61 is formed on the external casing base 60 and provided for a user to ride and used for simulating horseback riding. Referring to FIG. 12 for a second preferred embodiment of the present invention, the exercise apparatus A installs an external casing base 62, and a pivot external casing base 62 for a user to stand on the platform 63 for conducting a balance training and simulating slides and swings in different directions, so as to enhance the function, effect and fun of the exercise.

[0042] Referring to FIG. 13 for a third preferred embodiment of the present invention, the driving mechanism 30 has a rectangular board 373 disposed on the backside of a pivotal hole 372 of a driving member 37 at an end without the transmission disc driving module 34, such that the corner can precisely cover the position of $\frac{1}{4}$ of a circle of the pivotal hole 372, and the transmission shaft 33 has an eccentric protruding pillar 331 with $\frac{1}{4}$ of a circle-protruded from an end corresponding to the pivotal hole 372 of the driving member for embedding the eccentric protruding pillar 331 of the transmission shaft 33 into the pivotal hole 372, so that the lateral plane 331 of the eccentric protruding pillar 331 is aligned evenly with the lateral side 3731 at the corner of the board member 373 into a plane (as shown in FIG. 14A), and the top of the back-and-forth slide and swing module 50 has two parallel swing stands 58, 58'. Referring to FIGS. 15A and 15B, poking rods 341 of the transmission disc driving module and serrated grooves 351 of the transmission disc are installed with the ratio of 1:2, such that if the transmission disc driving module 34 turns two rounds, the transmission disc 35 will turn exactly one round. The driving mechanism 30 is operated, so that the swing stands 58, 58' can produce back-and-forth slides and up-and-down and left-and-right tilted swings. If the transmission shaft 33 rotates one round clockwise, the two swing stands 58, 58' will be parallel and swing and slide towards the front left corner with respect to the baseboard 21 (not shown in the figure) and the base module 10, and then return to the original positions. If the transmission shaft 33 rotates one round counterclockwise, the swing stands 58, 58' will be parallel and swing and slide towards the front right corner with respect to the baseboard 21 and the base module 10 and then return to the original position. Referring to FIG. 14B, if the transmission shaft 33 rotates counterclockwise, the eccentric protruding pillar 331 of the transmission shaft 33 will rotate 180 degrees along a pivotal hole of the driving member 37, and then the lateral plane 331 of the eccentric protruding pillar 331 will press precisely on a plane 3731 at a corner of the rectangular member 373 to pivotally turn the driving member to 180 degrees by the transmission shaft 33 (as shown in FIG. 14C) and displace the swing stand 58' accordingly and parallelly with the front and rear of another swing stand 58. If the transmission shaft 33 rotates a round counterclockwise and operates together with the driving mechanism 3 as shown in FIGS. 15C and 15D, the swing stand 58 will slide and swing to the right rear corner and the swing stand 58 will slide and swing to the right front corner, and the two swing stands 58, 58' will be alternately intersected, and then returned to their original position. If the transmission shaft 33 further rotates one round clockwise, the swing stand 58 will slide and swing towards the rear left corner and the swing stand 58' will slide and swing towards the front left corner and then the two swing stands 58, 58' will be alternately intersected, and then returned to their original positions.

[0043] Referring to FIGS. 16A and 16B for front views of movements of two swing stands 58, 58' intersected with each other, and FIG. 17 for a schematic view of a slide and swing exercise apparatus having two swing stands 58, 58' in accordance with the present invention, the apparatus is applied as a snow skiing balance training apparatus B for performing a snow skiing and balance training with fun.

[0044] The transmission disc driving module 34 and the transmission disc 35 could be a gear mechanism, a belt pulley mechanism or other driving mechanism.

What is claimed is:

1. A balance training apparatus for slide and swing exercises, comprising:
   a base module, having a base stand, and a left-and-right swing module pivotally coupled between front and rear sides of the base stand;
   a left-and-right swing module, having a plurality of pivotal connecting boards and a driving mechanism disposed on a baseboard;
   a driving mechanism, for driving a back-and-forth slide and swing module installed to the baseboard to produce back-and-forth up-and-down swings, and an eccentric axle rod driven by the driving mechanism drives the baseboard and uses
   a pivotal connecting point of the base module pivotal as a center to produce left, right and oblique swings;
   a back-and-forth slide and swing module, pivotally coupled to the baseboard of the left-and-right swing module, and formed by pivotally connecting a plurality of board stands, and pivotally coupled to a swing stand; such that if the driving mechanism is operated, the swing stand will produce back-and-forth or left-and-right tilted swings to simulate sliding and swinging situations in different directions, so as to enhance exercise functions and fun.

2. A method of using a balance training apparatus for slide and swing exercises comprising the steps of:
   (a) using an exercise apparatus driven by a driving mechanism installed on the exercise apparatus for training a human body;
   (b) pre-installing a program and a circuit in the exercise apparatus, while driving a swing stand of a back-and-forth slide and swing module to swing back and forth or up and down with respect to a base module; or working together with an adjusting mechanism to adjust the back-and-forth slide and swing module to displace horizontally on the baseboard of the left-and-right swing module to change the swinging amplitude of the back-and-forth slide and the swing module;
   (c) setting the driving mechanism to simultaneously pull a baseboard of the left-and-right swing module and use the pivotal connecting point of the base module as a center to produce left, right and tilted swings;
so as to form a multidirectional balance training apparatus for slide and swing exercises.

3. The balance training apparatus as claimed in claim 1, further comprising a base module disposed between the base module of the left-and-right swing module and the back-and-forth slide and swing module, for adjusting the back-and-forth slide and swing module to a horizontal position on the baseboard to change the swing amplitude of the back-and-forth slide and swing module.

4. The balance training apparatus as claimed in claim 3, wherein the adjusting mechanism has a motor installed at a lateral side of the left-and-right swing module baseboard, and the motor is latched and connected to a screw rod with an end pivotally connected to a baseboard of the left-and-right swing module through an axle rod of a decelerating mechanism, and a driving member is fixed onto the bottom of the back-and-forth slide and swing module and sheathed onto a screw rod of the adjusting mechanism.

5. The balance training apparatus as claimed in claim 1, wherein the base module has a link board module with a pivotal ear base disposed on a lateral side of the base stand, and a guide pin base with a guide slot pivotally connected to the pivotal ear base.

6. The balance training apparatus as claimed in claim 1, wherein the driving mechanism comprises a motor, a decelerating mechanism, a transmission disc driving module and a plurality of driving members, and a transmission disc driving module is sheathed in the axial center of the decelerating mechanism by a transmission shaft, and a driving member is installed separately on both ends of the transmission shaft, and another end of the driving member is pivotally coupled to the back-and-forth slide and swing module.

7. The balance training apparatus as claimed in claim 1, wherein the transmission disc driving module has a plurality of poking rods protruded equidistantly from the periphery of the transmission disc driving module, and the transmission disc driving module has a transmission disc, and a plurality of serrated grooves disposed equidistantly on the periphery of the transmission disc driving module for latching a poking rod with a corresponding transmission disc serrated groove.

8. The balance training apparatus as claimed in claims 5, wherein the transmission disc has a semicircular axle hole, for passing an eccentric protruding pillar protruded from an end of a pivotal axle into a semicircular axle hole of the transmission disc, and another end of the pivotal axle is passed correspondingly into a guide slot of the guide pin base of the link board module.

9. The balance training apparatus as claimed in claim 7, wherein the number of poking rods of the transmission disc driving module and the number of serrated grooves of the transmission disc are installed in the ratio of 1:2.

10. The balance training apparatus as claimed in claim 1, wherein the back-and-forth slide and swing module comprises first and second slide bases and a swing stand pivotally coupled with each other, and the first and second slide bases are formed by connecting a plurality of board stands, and the first slide base is pivotally coupled to the left-and-right swing module baseboard, and the middle of the top of the first slide base is connected to the second slide base through a plurality of board stands, and the top of the second slide base is pivotally coupled to a swing stand.

11. The balance training apparatus as claimed in claim 1, wherein the swing stand is in the form of two parallel swing stands and operated by the driving mechanism, such that if the motor drives the transmission shaft to rotate counterclockwise, an eccentric protruding rod at an end of the transmission shaft will be displaced to pull a swing stand at another end to swing parallelly to a predetermined distance; and the driving mechanism is operated to swing or slide the two swing stands in a parallel or an intersectional manner, so as to form a balance training apparatus for slide and swing exercises and a method thereof for a snow skiing.

12. The balance training apparatus as claimed in claim 1, further comprising an external casing base and a saddle seat disposed on the external casing base and provided for a user to ride or a platform disposed on the external casing base and provided for a user to stand, so as to achieve a balance training effect.

13. The balance training apparatus as claimed in claim 1, wherein the transmission disc driving module and the transmission disc mechanism could be a gear mechanism, a belt pulley mechanism or other driving mechanism.