

RUNNING PLATFORM OF TREADMILL, AND TREADMILL

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the priority benefit of China application serial no. CN202421736764.2, filed on July 22, 2024. The entirety of the above-mentioned patent application is hereby incorporated by reference herein and made a part of this specification.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of fitness equipment, and in particular to provide a running platform of a treadmill, and a treadmill.

BACKGROUND

[0003] In recent years, with the emphasis on healthy living and the acceleration of the pace of life, family fitness equipment has gradually become a hot spot in the market. With the development of the industry, users put forward higher requirements for fitness equipment.

[0004] A main frame of the traditional running platform is basically assembled by an iron frame, a chassis, etc., which is expensive and complicated to assemble. Moreover, the whole structure is bulky, thus requiring a larger use space.

[0005] Therefore, there is an urgent need for a treadmill, which can reduce the manufacturing cost of the treadmill and improve the use convenience of the treadmill.

SUMMARY

[0006] In order to solve the problems above, the present disclosure provides a running platform of a treadmill and the treadmill, which can reduce the manufacturing cost of treadmill and improve the use convenience of the treadmill.

[0007] In a first aspect, the present disclosure provides a running platform of a treadmill. The running platform is of an integrally formed structure, and the inside of the integrally formed running platform is of a grid structure.

[0008] In a possible implementation, the running platform includes a base portion, and a support portion. The support portion includes a left support portion, and right support portion. The base portion is connected to the left support portion and the right support portion to form an I-

shaped support structure.

[0009] In a possible implementation, the base portion or the support portion is internally provided with an accommodating groove.

[0010] In a possible implementation, the grid structure is arranged in the base portion.

[0011] In a possible implementation, the integrally formed running platform has a streamlined design.

[0012] In a second aspect, the present disclosure provides a treadmill, including the running platform in the first aspect and a belt, wherein the running platform comprises a base portion and a support portion; the belt is wrapped around the base portion.

[0013] In a third aspect, the present disclosure provides a treadmill, including rollers of the treadmill, a servo motor, a running platform, and a belt wrapped around the rollers of the treadmill. The running platform is of an integrally formed structure, includes a base portion, and a support portion. The belt is wrapped around the base portion, a movement contact plane is formed in an upper side of the base portion, a transmission shaft of the servo motor is connected to the rollers of the treadmill to drive the rollers of the treadmill to rotate. The rollers of the treadmill drive the belt to move on the movement contact plane.

[0014] In a possible implementation, a wear-resisting plate is arranged between the upper side of the base portion of the running platform and the belt.

[0015] In a possible implementation, the running platform is internally provided with an accommodating groove, and the servo motor is placed in the accommodating groove.

[0016] In a possible implementation, the support portion includes a left support portion, and right support portion. The base portion is connected to the left support portion and the right support portion to form an I-shaped support structure.

[0017] The accommodating groove is formed in the base portion of the running platform, an inner side of the left support portion of the running platform, or an inner side of the right support portion of the running platform.

[0018] In a possible implementation, the left support portion and the right support portion of the running platform are provided with a first accommodating groove and a second accommodating groove, respectively, and the servo motor is placed in the first accommodating groove.

[0019] The treadmill further includes a controller, and the controller is arranged in the second accommodating groove and electrically connected to the servo motor.

[0020] The technical solution provided by the present disclosure at least has the following

beneficial effects:

[0021] (1) The running platform of the treadmill according to the present disclosure is integrally formed. The inside of the integrally formed running platform is of a grid structure, which can provide good force-bearing performance, stiffness, and shock absorption capacity.

[0022] (2) The treadmill provided by the present disclosure employs an integrally formed running platform, such that a production process of multiple components is saved, the manufacturing cost of the treadmill is reduced, a structure of the treadmill is simplified, and the use convenience of the treadmill can be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] To describe the technical solutions of the present disclosure more clearly, the following briefly introduces the accompanying drawings required for describing the embodiments. Apparently, the accompanying drawings in the following description show merely some embodiments of the present disclosure, and those of ordinary skill in the art may still derive other drawings from these accompanying drawings without creative efforts.

[0024] FIG. 1 is a schematic diagram of a three-dimensional structure of a treadmill according to an embodiment of the present disclosure;

[0025] FIG. 2 is a perspective schematic diagram of a treadmill according to an embodiment of the present disclosure;

[0026] FIG. 3 is a schematic diagram of a three-dimensional structure of a running platform according to an embodiment of the present disclosure;

[0027] FIG. 4 is a schematic diagram of three-dimensional structures of main components of a treadmill according to an embodiment of the present disclosure after decomposition;

[0028] FIG. 5 is a schematic diagram of three-dimensional structures of various components of a treadmill according to an embodiment of the present disclosure after decomposition;

[0029] FIG. 6 is another schematic diagram of a three-dimensional structure of various components of the treadmill according to an embodiment of the present disclosure (in which a schematic diagram of a running platform is hidden);

[0030] FIG. 7 is side internal schematic diagram of a support portion on one side of a running platform of another treadmill according to an embodiment of the present disclosure (which is an internal structure schematic diagram acquired by damaging a protective cover on one side of the treadmill shown in FIG. 1 and partial outer wall of the support portion);

[0031] FIG. 8 is a sectional schematic diagram of a three-dimensional structure of treadmill

according to an embodiment of the present disclosure (this is a longitudinal sectional structural diagram acquired along an A-A' dotted line in FIG. 1);

[0032] FIG. 9 is a partial enlarged schematic diagram of each component of treadmill according to an embodiment of the present disclosure within the circle range in FIG.8;

[0033] FIG. 10 is a structural schematic diagram of a bottom view of the treadmill according to an embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0034] Explicit embodiments in the present disclosure have been through the foregoing accompanying drawings, and more detailed descriptions are provided below. These accompanying drawings and literal descriptions are not intended to limit the scope of the conception of the present disclosure in any manner, but explain the conception of the present disclosure with reference to specific embodiments for those skilled in the art.

[0035] The present disclosure provides accompanying drawings for further description of various embodiments. These accompanying drawings are a part of the disclosure of the present disclosure, which are mainly used to explain the embodiment, and can explain the operation principle of the embodiments in conjunction with the relevant description in this specification. With reference to these contents, those of ordinary skill in the art should be able to understand other possible implementations and the advantages of the present disclosure. Assemblies in the drawings are not drawn to scale, and similar assembly symbols are usually used to represent similar assemblies.

[0036] The present disclosure is further described below with reference to accompanying drawings and specific embodiments.

[0037] The embodiment of the present disclosure provides a treadmill. FIG. 1 is a schematic diagram of a three-dimensional structure of a treadmill according to an embodiment of the present disclosure, which reflects the overall appearance and the three-dimensional structure of the treadmill. FIG. 2 is a perspective schematic diagram of treadmill according to an embodiment of the present disclosure. FIG. 3 is a diagram of a three-dimensional structure of a running platform according to an embodiment of the present disclosure, and a running platform 5 is used as a support main body of the treadmill. FIG. 4 is a schematic diagram of three-dimensional structures of main components of a treadmill according to an embodiment of the present disclosure after decomposition. FIG. 5 is a schematic diagram of three-dimensional structures of various components of a treadmill according to an embodiment of the present disclosure after

decomposition.

[0038] In an embodiment of the present disclosure, as shown in FIG. 1 to FIG. 5, the running platform 5 is of an integrally formed structure, and includes a base portion 51, and a support portion 52. A belt 7 is wrapped around the base portion, a movement contact plane is formed in an upper side of the base portion, and a transmission shaft of the servo motor 2 is connected to the rollers 1 of treadmill to drive the roller 1 of the treadmill to rotate. The roller 1 of the treadmill drives the belt 7 to move on the movement contact plane.

[0039] In an embodiment of the present disclosure, the running platform 5 is integrally formed and undecomposable. The integrally formed running platform can save more cost, is high in assembly efficiency, convenient to maintain, and low in failure rate. Alternatively, the weight of the running platform can be reduced by using engineering plastics (e.g., polycarbonate, nylon, ABS (Acrylonitrile Butadiene Styrene), polypropylene etc.) or composite of plastics and fiber as the material of the running platform. More specifically, the composites may be a material obtained by compounding polypropylene (PP) with 10-30wt% of glass fiber GF, that is, 10-30wt% (for example, 10wt%, 15wt%, 20wt%, 25wt% or 30wt%) of glass fiber (GF) is added into the polypropylene (PP) for modification and reinforcement. The treadmill provided by the present disclosure is lighter, smaller, easy to store, and suitable for home use.

[0040] In a possible implementation, a wear-resisting plate 6 is arranged between the upper side of the base portion 51 of the running platform 5 and the belt 7. The wear-resisting plate 6 is used to enhance the flatness of the movement contact plane, and the wear-resisting plate 6 serves as support and buffer between the belt 7 and the running platform 5, thus improving the durability of the whole treadmill.

[0041] In a possible implementation, the running platform 5 is internally provided with an accommodating groove, and the servo motor 2 is placed in the accommodating groove.

[0042] In a possible implementation, the support portion includes a left support portion, and right support portion. The base portion 51 is connected to the left support portion and the right support portion to form an I-shaped support structure. FIG. 3 is a schematic diagram of a three-dimensional structure of a running platform according to an embodiment of the present disclosure. As shown in FIG. 3, the integrally formed running platform includes a base portion 51, and support portions 52 on left and right sides.

[0043] In this example, the accommodating groove may be formed in the base portion 51 of the running platform 5, more preferably in an inner side of the left support portion of the running platform 5, or in an inner side of the right support portion of the running platform 5.

[0044] In a possible implementation, the left support portion and the right support portion of the running platform 5 are provided with a first accommodating groove and a second accommodating groove, respectively, and the servo motor 2 is placed in the first accommodating groove. The treadmill further includes a controller 3, and the controller 3 is arranged in the second accommodating groove, and electrically connected to the servo motor 2 for driving the servo motor 2 to output a torque.

[0045] The servo motor 2 has the characteristics of miniaturization, and thus can be flexibly arranged in the running platform 5 without additionally providing a placement space for a motor, and the space can be effectively saved. For example, the servo motor 2 is arranged in the accommodating groove in the left support portion of the running platform 5, and the controller 3 is arranged in the accommodating groove in the right support portion of the running platform 5. For another example, the servo motor 2 and a pulley wheel connected thereto are placed in the accommodating groove in the left support portion of the running platform 5, and the controller 3 is arranged in the accommodating groove in the right support portion of the running platform 5. Certainly, considering the balance, aesthetics and functional connection of the counterweight theoretically, any position in the running platform 5 can be selected to place all components in the driving device of the treadmill in a dispersed or centralized manner, which is not limited in the present disclosure. The speed-regulating transmission mechanism 4 of the servo motor 2 may be further arranged on a first support plate 2a, and the controller 3 may be further arranged on a second support plate 3a.

[0046] FIG. 4 is a schematic diagram of three-dimensional structures of main components of a treadmill according to an embodiment of the present disclosure after decomposition. As shown in FIG. 4, the treadmill includes a roller 1 of the treadmill, a servo motor 2, a controller 3, a running platform 5, a wear-resisting plate 6, and a belt 7 wrapped around the roller 1 of the treadmill.

[0047] In a possible implementation, the inside of the integrally formed running platform 5 is of a grid structure, which can provide good force-bearing performance, stiffness, and shock absorption capacity. Alternatively, the size of the grid and the distribution of connection points in the grid structure can be set according to the overall size and bearing requirements of the running platform, which is not specifically limited in the present disclosure. The overall size of the running platform can adopt the common size of the running platform, or a running platform smaller than the common size can be selected according to the miniaturization requirements of the treadmill, thus matching the requirements for the size of the treadmill.

[0048] The treadmill provided by the embodiment of the present disclosure employs a running

platform of an integrally formed structure, which can achieve seamless connection through precise molds and processes in the manufacturing process, thus avoiding the possible problems of gaps and looseness in the traditional assembling structure. Such a seamless connection not only improves the stability of the running platform, but also reduces the noise and vibration during the exercise. Moreover, the running platform of the integrally formed structure generally employs a streamlined design. Such a design not only makes a running platform look more fashionable and high-end, but also is conducive to reducing wind resistance and noise.

[0049] Further, there is no need to provide an additional space for placing a driving portion. The servo motor and the controller can be flexibly arranged in any accommodating groove in the integrally formed running platform, which saves space to a great extent, ensures the compact and beautiful overall structure of the treadmill, and realizes a lightweight and portable household treadmill structure.

[0050] FIG. 5 is a schematic diagram of three-dimensional structures of various components of a treadmill according to an embodiment of the present disclosure after decomposition. Various optional components of the treadmill in various possible implementations are described below with reference to FIG. 5.

[0051] In a possible implementation, treadmill includes a front roller 1a, or a rear roller 1b. Both ends of the front roller 1a and both ends of the rear roller 1b are arranged outside installation corners on the running platform 5, and provided with protective covers 8.

[0052] In a possible implementation, the roller 1 of the treadmill is provided with a tightness adjusting member 101, which is used to adjust the tightness of the belt 7 wrapped around the roller of the treadmill. Alternatively, the tightness adjusting member 101 is an adjusting bolt, and both ends of the rollers (1a and 1b) of the treadmill are respectively provided with one adjusting bolt. Roller seats are driven to move back and forth by rotating the adjusting bolts at the rollers (1a and 1b) of the treadmill rotate, and then the tightness of the belt 7 can be adjusted, thus maintaining the stable operation of the belt 7, and reducing slippage and wear.

[0053] In a possible implementation, the treadmill further includes at least one accessory.

[0054] Reinforcing plate: at least one reinforcing plate 9 is arranged between the running platform 5 and the wear-resisting plate 6, and the reinforcing plate 9 is used for supporting and shock absorption.

[0055] Dustproof cover: the servo motor 2 in the driving device of the treadmill is provided with a dustproof cover 201.

[0056] Cushion block: At least one cushion block 10 is arranged at the lower side of the

running platform 5, which is used for anti-skid and sound insulation.

[0057] The embodiment of the present disclosure provides another structural schematic diagram of the treadmill, in which a structure of the running platform is hidden, as shown in FIG. 6, the front roller 1a is taken as an example, the protective covers 8 are installed at both ends of the front roller 1a, and the front roller 1a is also provided with tightness adjusting members 101 in the protective covers 8, preferably, the tightness adjusting member 101 is an adjusting bolt.

[0058] As shown in FIG. 6, the servo motor 2 and the speed regulating transmission mechanism 4 are arranged on one side of the belt 7. As shown in FIG. 7, the servo motor 2 and the speed regulating transmission mechanism 4 are embedded into the accommodating groove of the support portion 52 on one side of the running platform 5. The controller 3 is arranged on the other side of the belt 7, and embedded into the accommodating groove of the support portion 52 on the other side of the running platform 5.

[0059] The wear-resisting plate 6 is arranged between the belt 7 and the running platform 5, and multiple reinforcing plates 9 are arranged under the wear-resisting plate 6. The multiple reinforcing plates 9 are embedded into the running platform 5 from the upper side of the running platform 5. Specifically, as shown in FIG. 8 and FIG. 9, the surface on the upper side of the running platform 5 is provided with the same number of grooves 5a as the reinforcing plates 9, and the reinforcing plates 9 are embedded into the corresponding number of grooves 5a, thus achieving reinforcing support and shock absorption effects on the body of the running platform 5.

[0060] The cushion block 10 is arranged at the lower side of the running platform 5. Specifically, as shown in FIG. 10, the cushion block 10 is arranged below the support portion 52 of the running platform 5 for anti-skid and sound insulation. The remote controller 11 can be used to transmit an instruction to the controller 3 to control the mode of the treadmill.

[0061] In some other embodiments, the treadmill further supports a horizontal rhythmic function. The driving device of the treadmill composed of the roller 1 of the treadmill, the servo motor 2 and the controller 3 is used to achieve the horizontal rhythmic function. Specifically, the controller 3 is used to control an output torque of the servo motor 2, such that the roller 1 of the treadmill can drive the belt 7 to vibrate, rotate unidirectionally, or vibrate horizontally in the process of unidirectional rotation.

[0062] The servo motor 2 is internally and/or externally provided with an encoder, and is connected to the controller 3 through the encoder. The transmission shaft of the servo motor 2 is in transmission connection with the roller 1 of the treadmill.

[0063] In an embodiment of the present disclosure, the controller 3 is configured to achieve

the electric control of the whole device.

[0064] In an embodiment of the present disclosure, a variety of drive modes can be achieved by performing bidirectional alternate change and unidirectional change on the rotation angle of the servo motor 2. The multiple drive modes are described below.

[0065] Drive mode A: horizontal vibration

[0066] Specifically, when the rotation angle of the servo motor 2 is in bidirectional alternate change, the roller 1 of the treadmill are driven to vibrate horizontally. The bidirectional alternate change of the rotation angle of the servo motor 2 indicates that the rotation angle reversely rotates for a certain angle after rotating forward for a certain angle, thus achieving a movement track of rotating back and forth in two opposite directions. When the speed of forward rotation and reverse rotation reaches a certain value, the roller 1 of the treadmill are driven to achieve a horizontal vibration effect. From the sense of body of the user, the horizontal vibration can achieve a sense of body effect of vibratory massage, such that the treadmill can achieve massage effect while providing basic functions.

[0067] In a possible implementation, the drive mode A may also be enriched into multiple modes combining the horizontal vibration.

[0068] A1. Constant-speed walking/running mode with horizontal vibration effect

[0069] Specifically, in the bidirectional alternate change of the rotation angle of the servo motor 2: when a change amplitude of a rotation angle of a rotor of the servo motor 2 in a first direction is greater than that in a second direction, the roller 1 of the treadmill is driven to vibrate horizontally in the process of unidirectional rotation in the first direction. This process can be regarded as that the general trend is in the process of rotating in the first direction, and the vibration effect can be achieved by periodically rotating back to the second direction with a certain amplitude.

[0070] A frequency of the horizontal vibration corresponds to a difference between the change amplitude of the rotation angle in the first direction and the change amplitude of the rotation angle in the second direction.

[0071] A2. Back-and-forth sweeping mode with horizontal vibration effect (sweeping and vibration in one)

[0072] In a possible implementation, in one bidirectional alternate change cycle of the rotor of the servo motor 2:

[0073] when the rotor of the servo motor 2 changes back and forth in the first direction and the second direction according to a second amplitude within a set vibration cycle in the process of

changing the rotation angle with a first amplitude in the first direction, the roller 1 of the treadmill is driven to horizontally vibrate at a second frequency in the process of horizontally sweeping at a first frequency. This process can be regarded as that the back-and-forth vibration effect with a small amplitude is always kept in the process of large-amplitude horizontal back-and-forth cyclic displacement.

[0074] The set vibration cycle is smaller than the bidirectional alternate change cycle, the first amplitude is greater than the second amplitude, and the first frequency is less than the second frequency.

[0075] Drive mode B: unidirectional rotation

[0076] Specifically, when the rotation angle of the servo motor 2 is in unidirectional change, the roller 1 of the treadmill is driven to rotate unidirectionally. This mode may include a walking function and a running function based on constant speed and/or variable speed. The driving device of a treadmill provided by the present disclosure can drive the roller of the treadmill to rotate forward, or drive the roller of the treadmill to rotate reversely.

[0077] In a possible implementation, the driving device of the treadmill further includes a speed-regulating transmission mechanism. A torque output by the transmission shaft of the servo motor 2, after being regulated by the speed-regulating transmission mechanism, is input into the roller 1 of the treadmill. The speed-regulating transmission mechanism, for example, is a speed reducer, a pulley and belt, a sprocket and chain, etc.

[0078] Specifically, a combined structure of the pulley and the belt is relatively simple and easy to install and maintain. Belt transmission has the functions of cushioning and shock absorption, and can also reduce the impact and vibration during transmission. Moreover, a transmission ratio can be conveniently changed by adjusting a diameter ratio of the pulley, thus adjusting an output torque of the servo motor.

[0079] According to the treadmill provided by the present disclosure, the horizontal rhythm which is beneficial to physiological health is used to achieve a variety of exercise modes, thus improving the use experience and fitness effect of the user. Moreover, multiple interaction modes are provided to control the drive modes of the device, making the use more convenient. The horizontal rhythm can promote blood circulation and assist in the prevention of cardiovascular diseases.

[0080] Unless otherwise defined, technical terms or scientific terms used herein shall have their ordinary meanings as understood by those of ordinary skill in the art. The words "first", "second", "third" and the like used in the patent application specification and claims of the present

disclosure do not indicate any order, quantity or importance, but are only used to distinguish different components. Similarly, similar words such as "a" or "an" do not mean a quantity limit, but mean that there is at least one. Similar words such as "including" or "comprising" mean that the elements or objects before "including" or "comprising" cover the elements or objects listed after "including" or "comprising" and their equivalents, and do not exclude other elements or objects. Similar words such as "connecting" or "coupling" are not limited to physical or mechanical connection, but may include electrical connection, whether direct or indirect. "Up", "down", "left" and "right" are only used to express the relative positional relationship. When the absolute position of the described object changes, the relative positional relationship may also change accordingly.

[0081] Any modification, equivalent replacement, improvement, etc. made within the principle of the present disclosure should be included in the scope of protection of the present disclosure. Although the present disclosure has been particularly shown and described with reference to preferred embodiments, it should be understood by those skilled in the art that various changes in form and details can be made in the present disclosure without departing from the spirit and scope of the present disclosure as defined by the appended claims, which are all within the scope of protection of the present disclosure.

What is claimed is:

1. A running platform of a treadmill, wherein the running platform is of an integrally formed structure, and an inside of the integrally formed running platform is of a grid structure.
2. The running platform of a treadmill according to claim 1, wherein the running platform comprises a base portion and a support portion; the support portion comprises a left support portion and right support portion; and the base portion is connected to the left support portion and the right support portion to form an I-shaped support structure.
3. The running platform of a treadmill according to claim 2, wherein the base portion or the support portion is internally provided with an accommodating groove.
4. The running platform of a treadmill according to claim 2, wherein the grid structure is arranged in the base portion.
5. The running platform of a treadmill according to any one of claims 1~4, wherein the integrally formed running platform has a streamlined design.
6. A treadmill, comprising the running platform of a treadmill according to any one of claims 1~5 and a belt, wherein the running platform comprises a base portion and a support portion; the belt is wrapped around the base portion.
7. A treadmill, comprising a roller, a servo motor, a running platform, and a belt wrapped around the roller, wherein the running platform is of an integrally formed structure, and comprises a base portion and a support portion; the belt is wrapped around the base portion, a movement contact plane is formed in an upper side of the base portion, a transmission shaft of the servo motor is connected to the roller of the treadmill to drive the roller to rotate; and the roller drive the belt to move on the movement contact plane.
8. The treadmill according to claim 7, wherein the inside of the integrally formed running platform is of a grid structure, the grid structure is arranged in the base portion, and a wear-resisting plate is arranged between the upper side of the base portion and the belt.
9. The treadmill according to claim 7, wherein the running platform is internally provided with an accommodating groove, and the servo motor is placed in the accommodating groove.
10. The treadmill according to claim 7, wherein the support portion comprises a left support portion and a right support portion; and the base portion is connected to the left support portion and the right support portion to form an I-shaped support structure; and the accommodating groove is formed in the base portion, an inner side of the left support portion, or an inner side of the right support portion.
11. The treadmill according to claim 10, wherein the left support portion and the right support

portion of the running platform are provided with a first accommodating groove and a second accommodating groove, respectively, and the servo motor is placed in the first accommodating groove;

the treadmill further comprises a controller, and the controller is arranged in the second accommodating groove and electrically connected to the servo motor.

12. The treadmill according to claim 7, wherein, the material of the running platform is plastic or the composite of plastic and fiber.

13. The treadmill according to claim 12, wherein, the plastic is made of polycarbonate, nylon, ABS or polypropylene.

14. The treadmill according to claim 7, wherein, the material of the running platform is made of polypropylene with 10-30 wt% of glass fiber .

15. The treadmill according to claim 7, wherein the treadmill further includes multiple reinforcing plates arranged under the wear-resisting plate, and the multiple reinforcing plate are embedded into the running platform from an upper side of the running platform.

16. The treadmill according to claim 15, wherein, the surface on the upper side of the running platform is provided with a same number of grooves as the reinforcing plates, and the reinforcing plates are embedded into the corresponding number of grooves.