Title of the Invention: **Height-adjustable aerobic step**

Abstract Title: **Aerobic step with pivoting legs for adjustable height**

A height-adjustable aerobic step, the lower half of each supporting leg 3, 3' being disposed with a first positioning portion 31 having two parallel first lateral plates 311 and at least one first seizure portion 313, 314 on at least one first lateral plate 311, and the upper half of one extending leg 4 being disposed with a second positioning portion 41 which pivotally connects to the first positioning portion 31 for the extending leg 4 to be folded inwardly, or unfolded into a straight line with the supporting leg to elevate the height of the rectangular step platform 2. The second positioning portion 41 has two parallel second lateral plates 421 which are respectively corresponding to and placed adjacent to the two first lateral plates 311, and sides of at least the second lateral plates 421 are disposed with at least one second seizure portion 44 corresponding to the first seizure portion 313, 314 for fixing the position of the extending leg 4 at different angles. Preferably the platform is formed in two pieces 21, 22 joined by connecting rods 231 which sit in recesses 211.
HEIGHT-ADJUSTABLE AEROBIC STEP

Field of the Invention

[0001] The present invention relates to a height-adjustable aerobic step for allowing users to select different heights of the aerobic step so as to attain the effects for different exercise strengths.

Background

[0002] The aerobic stepper (also referred to as an “aerobic step” or “step”) commonly seen in the art are mainly comprised of a rectangular platform and two supporting legs respectively fixed below both ends in a length direction of the platform. The platform is upwardly supported by the two supporting legs and elevated by the height of the supporting legs, and is thus formed as a step platform for the user to step up and down with one foot from/to the front/back/left/right of the step during aerobic exercise, thereby allowing waist and leg exercise effects.

[0003] Conventional aerobic steps are manufactured by using the plastic injection molding process to form an integral structure. However, the volume of the aerobic step is huge and the structural design is complicated, which leads to high cost of mold development. Further, such aerobic steps utilize fixed-height platforms which cannot accommodate users of varying degrees of physical height and vary the intensity of the exercise to meet their individual needs.

Summary of the Invention

[0004] In view of foregoing, after hard research and development, a height-adjustable aerobic step is provided by the present invention in order to solve the shortcomings described above.

[0005] The object of the present invention is to provide a height-adjustable aerobic
step for users to selectively respectively fold two extending legs, or unfold the extending legs to position them to the bottoms of two supporting legs to effect different step platform heights, so as to respond to personal needs of different users for achieving adaptive fitness effects.

[0006] Another object of the present invention is to provide a height-adjustable aerobic step with a rectangular step platform structure combined by a first plate body, a second plate body and a connecting member, such that the volume of each component could be effectively reduced and the design could be simplified to efficiently reduce the production costs for developing molds.

[0007] In order to achieve the aforementioned objects, the height-adjustable aerobic step of the present invention comprises a rectangular step platform with two opposite ends in a length direction thereof and two supporting legs respectively downwardly extending from a bottom surface of each end, and is mainly characterized in that: a lower half of each supporting leg is disposed with a first positioning portion having two parallel first lateral plates with a side of at least one of them being disposed with at least one first seizure portion, and an upper half of one extending leg is disposed with a second positioning portion which pivotally connects to the first positioning portion for the extending leg to be folded inwardly relative to the supporting leg, such that a bottom surface of the supporting leg is at a top surface of the extending leg when the supporting leg and the extending leg are unfolded into a straight line. Further, the second positioning portion has two parallel second lateral plates which are respectively corresponding to and placed adjacent to the two first lateral plates, and a side of at least one of the second lateral plates is disposed with at least one second seizure portion for corresponding to the first seizure portion to limit its position.

[0008] In practice, the first positioning portion includes two parallel first lateral
plates with a receiving space therebetween.

[0009] In practice, the second positioning portion includes a protrusion portion upwardly extending from the top surface of the extending leg, and the two parallel second lateral plates are respectively formed at two sides of the protrusion portion, and the protrusion portion is pivotally located into the receiving space of the two first lateral plates.

[0010] In practice, one of the correspondingly and adjacently placed first and second lateral plates is a bendable flexible plate.

[0011] In practice, the second seizure portion is at least one bump and the first seizure portion is at least one hole corresponding to the second seizure portion, and two first seizure portions are respectively provided on the first lateral plates at a substantially vertical angle. The first seizure portion also could be at least one bump and the second seizure portion could be at least one hole corresponding to the first seizure portion, and two second seizure portions are respectively provided on the second lateral plates at a substantially vertical angle.

[0012] In practice, the rectangular step platform includes a first plate body, a second plate body and a connecting member, and the two supporting legs respectively downwardly extending from one end of the first plate body and one end of the second plate body while the other end of the first plate body is horizontally opposed to the other end of the second plate body, and the connecting member respectively connects to the bottom surface of the first and second plate body.

[0013] In practice, the bottom surface of the first plate body is disposed with at least one first elongated recess and the bottom surface of the second plate body is disposed with at least one second elongated recess correspondingly communicating with the first elongated recess, and the connecting member includes at least one elongated rod which is correspondingly received in the mutually communicated first
and second elongated recesses and respectively locked to the bottom surfaces of the first and second plate bodies.

[0014] Other objects, advantages and novel features of the present invention will become more apparent from the following detailed description given by way of example only, when taken in conjunction with the accompanying drawings.

**Brief Description of the Drawings**

[0015] FIG. 1 is a partly exploded perspective view of the preferred embodiment of the present invention.

[0016] FIG. 2 is a perspective view of the preferred embodiment of the present invention.

[0017] FIG. 3 is a schematic diagram showing two folded extending legs of the present invention in the usage condition.

[0018] FIG. 4 is a schematic diagram showing two unfolded extending legs of the present invention in the usage condition.

**Detailed Description**

[0019] The following description in combination with the figures is provided to assist in understanding the teachings disclosed herein. The following discussion will focus on specific implementations and embodiments of the teachings. This focus is provided to assist in describing the teachings and should not be interpreted as a limitation on the scope or applicability of the teachings.

[0020] The use of “a” or “an” is employed to describe elements and components described herein. This is done merely for convenience and to give a general sense of the scope of the invention. This description should be read to include one or at least one and the singular also includes the plural, or vice versa,
unless it is clear that it is meant otherwise.

[0021] The height-adjustable aerobic step of the present invention comprises a rectangular step platform with two opposite ends in a length direction thereof and two supporting legs respectively disposed on a bottom surface of each end, and a lower half of each supporting leg is disposed with a first positioning portion, and the sides of at least one of first lateral plate of the first positioning portion is disposed with at least one first seizure portion. An upper half of one extending leg is disposed with a second positioning portion which pivotally connects to the first positioning portion, and two second lateral plates of the second positioning portion are respectively corresponding to and placed adjacent to the two first lateral plates, and the sides of at least one of the second lateral plates is disposed with at least one second seizure portion for corresponding to the first seizure portion to limit its position, thereby when the extending leg is folded inwardly or unfolded into a straight line with the supporting leg, the position of the extending leg could be fixed at different rotation angles.

[0022] Referring to FIGS. 1 and 2 which shows a preferred embodiment of a height-adjustable aerobic step 1 of the present invention, the height-adjustable aerobic step 1 comprises a rectangular step platform 2, two supporting legs (3, 3’) and two extending legs (4, 4’).  

[0023] The rectangular step platform 2 includes a rectangular first plate body 21, a rectangular second plate body 22 and a connecting member 23, wherein one end in a length direction of the first plate body 21 is horizontally opposed to one end in a length direction of the second plate body 22, and the two supporting legs (3, 3’) are respectively downwardly extending from bottom surfaces of the other end of the first plate body 21 and the second plate body 22. The bottom surface of the first plate body 21 is disposed with two first elongated recesses 211 parallel to the length direction of the first plate body 21, and the bottom surface of the second plate body 22 is disposed
with two second elongated recesses 221 parallel to the length direction of the second plate body 22, and the two first elongated recesses 211 are respectively correspondingly communicating with the two second elongated recesses 221. Meanwhile, two elongated rods 231 are respectively received in two sets of the mutually communicated first and second elongated recesses (211, 221), and respectively upwardly locked to the bottom surfaces of the first and second plate bodies (21, 22) with a plurality of screw bolts 232, and these two elongated rods 231 are disposed to form the connecting member 23. In practice, there could be one or more sets of the mutually communicated first and second elongated recesses (211, 221) mentioned above, and a corresponding number of elongated rods 231.

[0024] The two extending legs (4, 4') respectively pivotally connect to the bottoms of the two supporting legs (3, 3'), and the two extending legs (4, 4') and the two supporting legs (3, 3') are formed by a plastic injection molding process. The following example is given to illustrate a combination of one supporting leg 3 and one extending leg 4, wherein the lower half of the supporting leg 3 is disposed with a first positioning portion 31 having two flexible first lateral plates 311 which are parallel and bendable, respectively. A receiving space 312 is formed between the two first lateral plates 311. The sides of any one of the first lateral plates 311 are disposed with two first seizure portions (313, 314) in the form of holes, and these two first seizure portions (313, 314) are disposed in any one of the first lateral plates 311 at a substantially vertical angle. The upper half of the extending leg 4 is disposed with a second positioning portion 41 with a projecting part 42 which is formed by upwardly extending from the top surface of the extending leg 4. Both sides of the projecting part 42 are respectively disposed with a bendable and flexible second lateral plate 421, and the two second lateral plates 421 are parallel to one another. As the projecting part 42 is pivotally located into the receiving space 312 of the two first lateral plates 311 by a
pivot shaft 43, the two second lateral plates 421 are respectively corresponding to and placed adjacent to the two first lateral plates 311. In practice, any set of the combination of the correspondingly adjacently placed first lateral plates 311 and second lateral plates 421 may have only one lateral plate to be the bendable and flexible plate. Further, the side of any one of the second lateral plates 421 is disposed with a second seizure portion 44 in the form of two bumps, which are corresponding to the two holes of any one of the first seizure portions (313, 314) to limit its position.

[0025] As shown in FIG. 3, when the two extending legs (4, 4’) are respectively swivelled to allow them to be inwardly folded relative to the two supporting legs (3, 3’) respectively, the two extending legs (4, 4’) could be laid on the bottom surfaces of the first and second plate bodies (21, 22) and positioned thereon by the corresponding engagement between the second seizure portion 44 of any one of the extending legs (4, 4’) and a first seizure portion 314 of the supporting legs (3, 3’), such that the rectangular step platform 2 could have a fixed height configuration by the support formed by the two supporting legs (3, 3’).

[0026] As shown in FIG. 4, when the two extending legs (4, 4’) are respectively swivelled outwardly by the user, since there is at least one lateral plate to be the bendable and flexible plate in any set of the combination of the correspondingly adjacently placed first lateral plates 311 and second lateral plates 421, the second seizure portion 44 of the second lateral plate 421 is allowed to move on the plate surface of the first later plate 311, such that the second seizure portion 44 of any one of the extending legs (4, 4’) could correspondingly engage another first seizure portion 313 of the supporting legs (3, 3’), so as to make the two supporting legs (3, 3’) and the extending legs (4, 4’) be respectively unfolded into a straight line, thereby the bottom surfaces of the supporting legs (3, 3’) is respectively at a top surface of the extending legs (4, 4’) to allow the two extending legs (4, 4’) to be steadily positioned
for elevating the height of the rectangular step platform 2.

[0027] In practice, any one of the abovementioned first seizure portions (313, 314) could also be at least one bump, and the second seizure portion 44 is at least one hole corresponding to the first seizure portions (313, 314), and there are two second seizure portions 44 disposed in the second lateral plates 421 at a substantially vertical angle to allow any extending leg (4, 4') to be steadily positioned after swivel movement in the same way.

[0028] Therefore, the present invention has the following advantages:

[0029] 1. The present invention utilizes different combinations of two supporting legs and two extending legs to allow the user to select exercise models of two different heights, so as to respond to personal needs of different users for achieving adaptive fitness effects.

[0030] 2. The present invention utilizes the connecting members to connect the first and second plate bodies and combine into a rectangular step platform, such that the volume of each component could be effectively reduced and the design could be simplified to efficiently reduce the production costs for developing molds.

[0031] 3. The lateral plate of any combination of the correspondingly and adjacently placed first and second lateral plates is a bendable flexible plate, such that after the seizure portion of one lateral plate abuts against and pushes out another lateral plate, the seizure portion could move on the plate surface of the another lateral plate in order to respectively engage and position to different seizure portion of the another lateral plate. Therefore, it could be conveniently used by a simple configuration.

[0032] As stated in the above disclosed, the present invention can surely achieve its expected objects to provide a height-adjustable aerobic step which allowing the user to select exercise models of different heights to attain the effects for different exercise
strengths, and the manufacturing costs could be efficiently reduced to produce a
simple and conveniently used configuration.

[0033] It is to be understood that the figures and descriptions of the present
invention have been simplified to illustrate elements that are relevant for a clear
understanding of the present invention, while eliminating, for the purposes of clarity,
many other elements which may be found in the present invention. Those of ordinary
skill in the pertinent art will recognize that other elements are desirable and/or
required in order to implement the present invention. However, because such elements
are well known in the art, and because such elements do not facilitate a better
understanding of the present invention, a discussion of such elements is not provided
herein.
What is claimed is:

1. A height-adjustable aerobic step comprising a rectangular step platform with two opposite ends in a length direction thereof and two supporting legs respectively downwardly extending from a bottom surface of each end, characterized in that:
   a lower half of each supporting leg is disposed with a first positioning portion having two parallel first lateral plates with a side of at least one of them being disposed with at least one first seizure portion, and an upper half of one extending leg is disposed with a second positioning portion which pivotally connecting to the first positioning portion for the extending leg to be folded inwardly relative to the supporting leg such that a bottom surface of the supporting leg is at a top surface of the extending leg when the supporting leg and the extending leg are unfolded into a straight line, and the second positioning portion has two parallel second lateral plates which are respectively corresponding to and placed adjacent to the two first lateral plates, and a side of at least one of the second lateral plates is disposed with at least one second seizure portion for corresponding to the first seizure portion to limit its position.

2. The height-adjustable aerobic step according to claim 1, wherein the first positioning portion includes two parallel first lateral plates with a receiving space therebetween.

3. The height-adjustable aerobic step according to claim 2, wherein the second positioning portion includes a protrusion portion upwardly extending from the top surface of the extending leg, and the two parallel second lateral plates are respectively formed at two sides of the protrusion portion, and the protrusion portion is pivotally located into the receiving space of the two first lateral plates.

4. The height-adjustable aerobic step according to claim 1, wherein one
of the correspondingly and adjacently placed first and second lateral plates is a bendable flexible plate.

5. The height-adjustable aerobic step according to claim 4, wherein the second seizure portion is at least one bump and the first seizure portion is at least one hole corresponding to the second seizure portion, and two first seizure portions are respectively provided on the first lateral plates at a substantially vertical angle.

6. The height-adjustable aerobic step according to claim 4, wherein the first seizure portion is at least one bump and the second seizure portion is at least one hole corresponding to the first seizure portion, and two second seizure portions are respectively provided on the second lateral plates at a substantially vertical angle.

7. The height-adjustable aerobic step according to any one of claims 1 to 6, wherein the rectangular step platform includes a first plate body, a second plate body and a connecting member, and the two supporting legs respectively downwardly extending from one end of the first plate body and one end of the second plate body while the other end of the first plate body is horizontally opposed to the other end of the second plate body, and the connecting member respectively connects to the bottom surface of the first and second plate body.

8. The height-adjustable aerobic step according to claim 7, wherein the bottom surface of the first plate body is disposed with at least one first elongated recess and the bottom surface of the second plate body is disposed with at least one second elongated recess correspondingly communicating with the first elongated recess, and the connecting member includes at least one elongated rod which is correspondingly received in the mutually communicated first and second elongated recesses and respectively locked to the bottom surfaces of the first and second plate bodies.
Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC\(^X\):

Worldwide search of patent documents classified in the following areas of the IPC
A63B

The following online and other databases have been used in the preparation of this search report
WPI, EPODOC

International Classification:

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