

DESCRIPTION

SANDAL

5 TECHNICAL FIELD

[0001]

The present invention relates to a sandal that allows a wearer to achieve beautiful legs by the effect of exercise.

10 BACKGROUND ART

[0002]

For example, as shown in Patent Document 1 and Patent Document 2, types of footwear such as sandals that aim to achieve the effect of exercise have been proposed.

15 [0003]

In the structures disclosed in Patent Document 1 and Patent Document 2, the bottom surface of the footwear curves in an arcuate shape such that the middle section in the longitudinal direction protrudes further downward than the edges in the longitudinal direction.

PRIOR ART DOCUMENTS

Patent Documents

[0004]

25 Patent Document 1: Japanese National Phase Laid-Open Patent Publication No. 2009-528879

Patent Document 2: Japanese Registered Utility Model No. 3168694

30 SUMMARY OF THE INVENTION

Problems that the Invention is to Solve

[0005]

The bottom surfaces of the conventional sandals disclosed in Patent Document 1 and Patent Document 2 curve as described above. However, since the center of gravity of

the sandals is set at the center portion in the longitudinal direction, the center of gravity is at the same position as normal shoes and sandals in a state in which the wearer is wearing the sandal. Therefore, it is difficult to achieve
5 sufficient effect of exercise.

[0006]

The present invention focuses on such a problem of the conventional technology. It is an objective of the present invention to provide a sandal that achieves sufficient
10 effect of exercise.

Means for Solving the Problems

[0007]

To achieve the foregoing objective and in accordance
15 with one aspect of the present invention, a sandal including a main body is provided. The main body includes a heel holding portion at a back part of the main body. The main body has a bottom surface that curves such that a middle section in a longitudinal direction protrudes further
20 downward than edges in the longitudinal direction. A center of gravity of the sandal is set at a front part of the main body.

[0008]

The bottom surface of the main body preferably curves
25 such that a middle section in a transverse direction protrudes further downward than edges in the transverse direction.

[0009]

The bottom surface of the main body preferably bulges
30 downward in a spherical shape.

[0010]

A thong is preferably provided on an upper surface of the front part of the main body. An instep holding portion for holding an instep is preferably disposed at an upper
35 edge of the thong.

[0011]

An instep holding portion for holding an instep is preferably provided at the front part of the main body.

[0012]

5 The instep holding portion preferably bridges edges in the transverse direction of the main body.

[0013]

10 The instep holding portion preferably includes two holding pieces that extend upward from the edges in the transverse direction of the main body and approach each other. A gap between distal ends of the holding pieces is preferably allowed to widen.

[0014]

15 The distal ends of the holding pieces are preferably coupled to each other by a coupling portion.

[0015]

20 A width in the longitudinal direction of the coupling portion is preferably less than a width of the holding pieces. A thickness of the coupling portion is preferably less than a thickness of the holding pieces.

[0016]

A bottom surface of the front part of the main body preferably includes a non-slip portion.

[0017]

25 The back part of the main body preferably includes a loop that can be wrapped around a heel.

EFFECTS OF THE INVENTION

[0018]

30 According to the sandal of the present invention, since the center of gravity is set at the main body front part, the wearer is easily brought into a state similar to standing on the tiptoes when wearing the sandals, and sufficient effect of exercise is achieved.

35

BRIEF DESCRIPTION OF THE DRAWINGS

[0019]

Fig. 1 is a side view of a sandal according to one embodiment of the present invention;

5 Fig. 2 is a perspective view of the sandal as viewed from obliquely above the back part of the sandal;

Fig. 3 is a perspective view of the sandal as viewed from obliquely below;

Fig. 4 is a plan view of the sandal;

10 Fig. 5 is a cross-sectional front view of the sandal;

Fig. 6 is a cross-sectional left view of the sandal;

Fig. 7 is a diagram showing operation of the sandal and is a side view showing a state in which the wearer is wearing the sandal and standing still;

15 Fig. 8 is a side view showing a state in which the wearer is starting to walk from the state shown in Fig. 7;

Fig. 9 is a side view showing a state in which the wearer has moved the weight slightly forward from the state shown in Fig. 8;

20 Fig. 10 is a side view showing a state in which the wearer has moved the weight to the foremost position and is kicking up from the state shown in Fig. 9;

Fig. 11 is a perspective view of a sandal according to a modification of the present invention, and the sandal is
25 viewed from obliquely above the back part of the sandal;

Fig. 12 is a perspective view of a sandal according to another modification of the present invention, and the sandal is viewed from obliquely above the back part of the sandal;

30 Fig. 13 is a cross-sectional view of the main body back part of the sandal in Fig. 12;

Fig. 14 is a perspective view of a sandal according to still another modification of the present invention, and the sandal is viewed from obliquely above the back part of the
35 sandal; and

Fig. 15 is a cross-sectional view of an instep holding portion of the sandal in Fig. 14.

MODES FOR CARRYING OUT THE INVENTION

5 [0020]

One embodiment of the present invention will now be described with reference to Figs. 1 to 10.

[0021]

Figs. 5 and 6 show one of a pair of left and right sandals 10 (right sandal). Each sandal 10 includes a main body 11. The main body 11 includes a rigid plastic frame portion 19. The frame portion 19 is covered with a soft plastic covering portion 20. The covering portion 20 improves the sensation given to the sole by the sandal 10. The rigid plastic includes a rigid synthetic plastic such as a polyurethane plastic, a polyvinyl chloride plastic, and a polyester plastic. The soft plastic includes an ethylene vinyl acetate (EVA) copolymer plastic and a thermoplastic elastomer such as a polyethylene-based elastomer and a polystyrene-based elastomer.

[0022]

As shown in Figs. 1 and 2, the main body 11 of the sandal 10 includes a main body front part 12, on which the front part of the foot including the toes are placed, and a main body back part 13, on which the back part of the foot including the heel is placed and which serves as a heel holding portion. As shown in Figs. 5 and 6, a bottom surface 12A of the main body front part 12 includes a first curved surface 12a and a second curved surface 12b. The middle section in the longitudinal direction of the first curved surface 12a protrudes further downward than the edges in the longitudinal direction, and the middle section in the transverse direction of the second curved surface 12b protrudes further downward than the edges in the transverse direction. The curvature of the second curved surface 12b

is set greater than the curvature of the first curved surface 12a. For example, the radius of curvature of the first curved surface 12a at the contact surface is preferably within the range of 100 to 150 mm, and the radius of curvature of the second curved surface 12b is preferably within the range of 50 to 90 mm. Since the first and second curved surfaces 12a, 12b are formed, the bottom surface 12A of the main body 11 bulges in a spherical shape.

[0023]

As shown in Figs. 1 and 2, the center of gravity of the sandal 10 is set in the main body front part 12. In other words, the weight balance of the sandal 10 and the curvature of the first curved surface 12a are set such that the main body front part 12 is located lower than the main body back part 13 when the sandal 10 is not in use. Thus, when the wearer is wearing the sandal 10 and standing still, the weight of the wearer is supported by the main body front part 12. A gently recessed heel placing portion 14 is formed on the upper surface of the main body back part 13. The heel placing portion 14 is formed of soft material and is substantially oval in a planar view.

[0024]

As shown in Fig. 1, a recess 15, which curves to open rearward and toward lateral sides is formed at the bottom of the main body back part 13. The recess 15 reduces the mass of the main body back part 13 and shifts the center of gravity of the entire sandal 10 to the main body front part 12. This shifts the weight balance of the entire sandal 10 forward.

[0025]

As shown in Figs. 1 and 5, a thong 16 projects on the upper surface of the main body front part 12 to be held between the big toe and the second toe. The thong 16 is located on the upper surface of the main body front part 12 at a position slightly shifted inward of the foot toward the

left sandal from the central position in the transverse direction. Furthermore, the thong 16 tilts such that the upper section is located rearward of the lower section. The cross-section of the thong 16 is substantially elliptic
5 extending in the longitudinal direction. Thus, the thong 16 is easy to be held between the big toe and the second toe, and when the wearer wears the sandal 10, the wearer can firmly hold the thong 16 in a stable manner with the big toe and the second toe.

10 [0026]

As shown in Figs. 1 and 4, an instep holding portion 17, which extends rearward to contact the instep, is formed on the upper edge of the thong 16. The instep holding portion 17 has a curved surface that fits the surface of the instep.
15 The upper surface of the instep holding portion 17 is provided with a plated metallic luster layer 18 to improve the design.

[0027]

As shown in Figs. 1 and 2, a projection 21, which
20 presses the arch of the foot, is formed at a part of the upper surface of the main body 11 between the main body front part 12 and the main body back part 13. The projection 21 curves to contact almost the entire arch when the wearer wears the sandal 10.

25 [0028]

As shown in Fig. 3, a non-slip portion 22, which limits slipping between the floor and the sandal 10, is formed on the bottom surface 12A of the main body front part 12. The non-slip portion 22 has an oval bottom surface. The non-
30 slip portion 22 is formed of a material having a high coefficient of friction such as a synthetic rubber including a polyurethane rubber, a natural rubber, and a thermoplastic elastomer.

[0029]

35 Operation of the above described sandal 10 will now be

described.

[0030]

As shown in Fig. 7, the wearer holds the thong 16 between the big toe and the second toe of toes 25 and places the instep against the instep holding portion 17 to wear the sandal 10. In a state in which the wearer is wearing the sandal 10, since the center of gravity of the sandal 10 is at the front, the wearer receives a load that acts toward the front lower section. Thus, the wearer is brought into a state similar to standing on the tiptoes. Furthermore, since the undersurface of the main body 11 is formed to be substantially spherical as a whole by the first curved surface 12a and the second curved surface 12b, the undersurface of the main body 11 is substantially in a point contact in relation to the floor surface. Thus, the wearer of the sandal 10 is required to balance in the longitudinal direction, the transverse direction, and combined directions of the longitudinal and transverse directions. Furthermore, in a state in which the wearer is wearing the sandal 10, since a foot 26 of the wearer is located such that the toes 25 are lower than the heel 27, the wearer supports most of the weight in the vicinity of the toes 25. Thus, regardless of whether the wearer is standing still or not, a great load is applied not only to the muscles of the calf and the muscles of the thigh, but to the entire leg, and the muscles of the leg are strongly stimulated and toned up.

[0031]

As shown in Figs. 8 to 10, when the wearer walks while wearing the sandal 10, a contact point p between the main body 11 and the floor surface 24 continuously shifts in the longitudinal direction. Thus, the wearer can smoothly shift the body weight. Thus, while a great load is applied to the legs, the wearer can walk in a stable manner. Furthermore, since the contact point p between the main body 11 and the floor surface 24 is in a point contact, the sandal 10 is

easily turned around the contact point, and the wearer can easily change directions.

[0032]

Accordingly, the above described embodiment provides
5 the following advantages.

[0033]

(1) The center of gravity of the sandal 10 according to the above embodiment is at the front. Thus, when the wearer is wearing the sandals 10, the center of gravity of the
10 wearer shifts forward, and the wearer is guided to lean forward. To act against this, or to hold his or her ground, the wearer is brought into a state similar to standing on the tiptoes. Thus, since a great load is applied to the calves and the thighs, the wearer of the sandals 10 obtains
15 efficient effect of exercise and achieves healthy beautiful legs. In addition, since the heel of the wearer is supported on the back part of the main body 11, the wearer can stand and walk in a stable manner.

[0034]

20 (2) The sandal 10 according to the above embodiment includes the main body 11, which has the instep holding portion 17. The bottom surface of the main body 11 curves such that the middle section in the longitudinal direction protrudes further downward than the edges in the
25 longitudinal direction. Also, the bottom surface of the main body 11 curves such that the middle section in the transverse direction protrudes further downward than the edges in the transverse direction. Thus, when the wearer is wearing the sandals 10, the sandals 10 tilt in the
30 longitudinal direction, the transverse direction, and combined directions (oblique directions). As a result, the wearer is made to hold his or her ground and obtains efficient effect of exercise to the legs such as the calves and the thighs, thus achieving healthy beautiful legs as
35 described above.

[0035]

(3) Since the wearer grips the thongs 16 with the toes, the wearer can stand and walk while wearing the sandals 10 in a stable manner and can obtain further efficient effect of exercise on regions such as the ankles.

[0036]

(4) Since the instep holding portion 17 abuts against the instep 28 of the foot 26, the sandal 10 does not easily come off, and the wearer can perform movement such as walking in a stable manner.

[0037]

(5) Since the recess 15 is formed at the back part of the main body 11, the center of gravity of the main body 11 is set at the front section of the main body 11 without using a weight or the like. Thus, the wearer can balance the weight while leaning forward as described above. As a result, the weight of the wearer is supported by his or her own entire toes 25, and the wearer can take the correct posture with a straight back. Furthermore, since the wearer is made to be in a posture similar to standing on the tiptoes in this state, the muscles of the calves and the muscles of the thighs are trained. In addition, since each heel of the wearer is supported by the heel placing portion 14, although the wearer is in the posture similar to standing on the tiptoes, the wearer can stand and walk in a stable manner.

[0038]

(6) Since the main body front part 12 is in a point contact with the floor surface at the contact point p, the weight of the wearer is supported at the contact point p. Thus, the wearer can smoothly turn around the contact point p, which is suitable for changing directions.

[0039]

(7) The main body 11 includes the rigid plastic frame portion 19, and the frame portion 19 is covered with the

soft plastic covering portion 20. This improves the sensation given to the sole of the wearer when the wearer wears the sandal 10, while maintaining the strength and the rigidity of the sandal 10.

5 [0040]

(8) The non-slip portion 22 is provided on the bottom surface 12A of the main body front part 12. Thus, the wearer can stand and walk in a stable manner while wearing the sandals 10, and the floor surface 24 is prevented from
10 being damaged.

[0041]

(9) The projection 21, which presses the arch of the sole, is provided between the main body front part 12 and the main body back part 13. Thus, when the wearer wears the
15 sandal 10, the sandal 10 supports the sole of the wearer in a stable manner and improves the health by stimulating the arch.

[0042]

The above described embodiment may be modified as
20 follows.

[0043]

As shown in Fig. 11, the thong 16 may be omitted, and the instep holding portion 17 may bridge the edges in the transverse direction of the main body front part 12 to have
25 a portal shape.

[0044]

As shown in Figs. 12 and 13, the thong 16 may be omitted, and the instep holding portion 17 may be formed by a pair of holding pieces 17a, which extend upward from the
30 edges in the transverse direction of the main body front part 12 and approach each other. The holding pieces 17a are elastic and extend upward toward the upper portion of the middle part of the main body front part 12, that is, the upper surface of the instep. In this case, the distal ends
35 of the holding pieces 17a may face each other with a gap or

may overlap each other. In either case, since the holding pieces 17a are widened in accordance with the height of the instep and the width of the foot in the transverse direction against elasticity, the sandal 10 is appropriately held when the wearer is wearing the sandal 10. This makes the sandal 10 easy to put on. Figs. 12 and 13 show an example of the main body 11 formed by cores 11a, 11b, which are stacked on top of each other in the vertical direction. The cores 11a, 11b are made of an ethylene-vinyl acetate (EVA) copolymer plastic. The cores 11a, 11b are integrally coupled by, for example, adhesion, thermal welding, ultrasonic welding, or vibration welding. Furthermore, the cores 11a, 11b may be covered with a cover material made of the same material or a different material. The cover material may be integrally molded or provided by ultrasonic bonding. Furthermore, the entire core may be formed of a single member.

[0045]

As shown in Fig. 12, the entire upper surface of the main body 11 may be gently recessed to encompass the foot from the sole.

[0046]

As shown by long dashed double-short dashed lines in Fig. 1, coupling portions 171, 172 may be formed between the main body front part 12 and the edges in the transverse direction of the instep holding portion 17. In this case, the thong 16 may be omitted.

[0047]

The sandal 10 may include one of the coupling portions 171, 172 shown by the long dashed double-short dashed line in Fig. 1, that is, the coupling portion 172, which corresponds to the inner side of the foot, and the thong 16 (the coupling portion 171, which corresponds to the outer side of the foot, is not provided). With this structure, the outer side of the toes is not covered, and an unconstrained appearance is obtained.

[0048]

Like the structure in Figs. 12 and 13, the thong 16 may be omitted, and a pair of holding pieces 17a, which extend toward the upper surface of the instep, may be provided as shown in Figs. 14 and 15. However, unlike the structure of Figs. 12 and 13, a narrow and thin coupling portion 17c is integrally formed between the holding pieces 17a. The coupling portion 17c does not very much restrain the movement of the instep holding portion 17 and allows the instep holding portion 17 to be flexibly deformed in accordance with the movement of the foot. This makes the sandal 10 to be comfortable. A cloth ribbon 30, which may be any color such as black, may be wound around the coupling portion 17c as a decorative accent. However, the ribbon 30 does not necessarily have to be provided and may be omitted. Furthermore, in the embodiment shown in Figs. 14 and 15, the covering portion 20 made of an EVA forms the entire frame, and an insole 202 made of an EVA that is softer than the EVA of the covering portion 20 is fitted in a recess 201 in the upper surface of the covering portion 20. Thus, the insole 202 contacts the sole in a wide area to fit comfortably to the sole and provides cushioning effect. This makes the sandal 10 to be comfortable. A non-slip liner 29 is adhered to the upper surface of the insole 202.

[0049]

As shown by a long dashed double-short dashed line in Figs. 1 and 2, a loop 13a, which wraps around the heel of the wearer, may be provided on the main body back part 13. In this case, the wearing state is stabilized, and the wearer can walk in a stable manner.

[0050]

The non-slip portion 22 of the bottom surface 12A of the main body front part 12 may be configured by projections and recesses formed on the bottom surface 12A or by applying an anti-slip agent without providing a separate member as in

the above embodiment.

[0051]

As shown by Fig. 14 and the long dashed double-short dashed line in Fig. 1, the recess 15 at the bottom of the
5 main body back part 13 may be omitted.

[0052]

The non-slip portion 22 of the bottom surface 12A of the main body front part 12 may be omitted.

[0053]

10 Protrusions that stimulate acupressure points on the sole may be provided at proper positions on the upper surface of the main body 11.

DESCRIPTION OF THE REFERENCE NUMERALS

15 [0054]

10...sandal, 11...main body, 12...main body front part,
12A...bottom surface, 12a...first curved surface,
12b...second curved surface, 13...main body back part,
13a...loop, 15...recess, 16...thong, 17...instep holding
20 portion, 17a...holding pieces, 17c...coupling portion,
19...frame portion, 20...covering portion, 21...projection,
22...non-slip portion, 26...foot, 27...heel, 28...instep.

CLAIMS

1. A sandal comprising a main body, **characterized in that,**

5 the main body includes a heel holding portion at a back part of the main body,

the main body has a bottom surface that curves such that a middle section in a longitudinal direction protrudes further downward than edges in the longitudinal direction,

10 and

a center of gravity of the sandal is set at a front part of the main body.

2. The sandal according to claim 1, **characterized in**
15 **that** the bottom surface of the main body curves such that a middle section in a transverse direction protrudes further downward than edges in the transverse direction.

3. The sandal according to claim 1 or 2,
20 **characterized in that** the bottom surface of the main body bulges downward in a spherical shape.

4. The sandal according to claim 1 or 2,
characterized in that
25 a thong is provided on an upper surface of the front part of the main body, and
an instep holding portion for holding an instep is disposed at an upper edge of the thong.

30 5. The sandal according to claim 1 or 2,
characterized in that an instep holding portion for holding an instep is provided at the front part of the main body.

6. The sandal according to claim 5, **characterized in**
35 **that** the instep holding portion bridges edges in the

transverse direction of the main body.

7. The sandal according to claim 5, **characterized in that**

5 the instep holding portion includes two holding pieces that extend upward from the edges in the transverse direction of the main body and approach each other, and a gap between distal ends of the holding pieces is allowed to widen.

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8. The sandal according to claim 7, **characterized in that** the distal ends of the holding pieces are coupled to each other by a coupling portion.

15 9. The sandal according to claim 8, **characterized in that**

a width in the longitudinal direction of the coupling portion is less than a width of the holding pieces, and a thickness of the coupling portion is less than a
20 thickness of the holding pieces.

10. The sandal according to claim 1 or 2, **characterized in that** a bottom surface of the front part of the main body includes a non-slip portion.

25

11. The sandal according to claim 1 or 2, **characterized in that** the back part of the main body includes a loop that can be wrapped around a heel.

ABSTRACT

A sandal (10) includes a main body (11). The main body (11) is configured from a main body front part (12) and a
5 main body back part (13). The main body front part (12) bears the front part of the foot, which includes toes, and the main body back part (13) bears the rear part of the foot, which includes the heel. The weight balance of the sandal (10) is set such that the main body front part (12) is lower
10 than the main body back part (13). A first curved surface (12a) is formed on the bottom surface of the main body front part (12). The first curved surface (12a) is curved such that the middle section in the longitudinal direction protrudes further downward than the edges in the
15 longitudinal direction. A second curved surface is formed on the bottom surface. The second curved surface is curved such that the middle section in the transverse direction protrudes further downward than the edges in the transverse direction. A recess (15), which opens rearward and sideways,
20 is formed in the bottom of the main body back part (13). A thong (16), which is held between the toes, is provided on the upper surface of the main body front part (12).