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(54) **FOOT BALANCING DEVICE**

(57) A foot balancing device includes a shoe insert (10), a main balancing element (20), three auxiliary force-transferring elements (31, 32, 33), and three auxiliary balancing elements (41, 42, 43). The main balancing element (20) is provided in an arch region (14) of the shoe insert (10) and serves as a fulcrum on the shoe insert (10) for the front part of the sole of one of the user's feet and the heel of the foot. The auxiliary force-transferring elements (31, 32, 33) are provided in the arch region

(14) of the shoe insert (10) so that the pressure center of the sole will displace along an ideal line. The auxiliary balancing elements (41, 42, 43) are located forward of and on two lateral sides of the main balancing element (20) respectively to support a transverse arch, inner arch, and outer arch of the foot respectively. Thus, the user's body weight can distribute evenly over the sole while the user is standing or walking, thereby preventing injury resulting from improper posture.

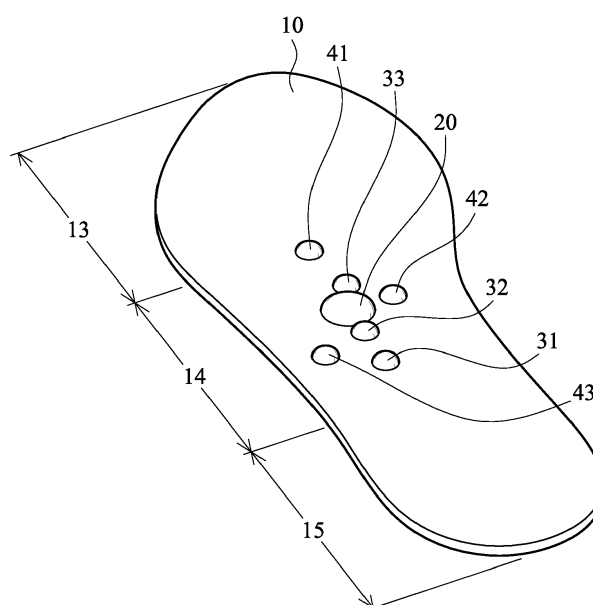


FIG. 1

Description

Field of the Invention

[0001] The invention relates to a foot balancing device and, more particularly, to a foot balancing device which enables uniform distribution of a user's body weight over the feet while the user is standing or walking.

Background of the Invention

[0002] With the development and progress of economy, people nowadays have far fewer opportunities for physical labor than before, and a lack of physical activities has increased the chances of various diseases of affluence significantly.

[0003] On the other hand, chronic pain resulting from improper posture is common to many, if not more common than the diseases of affluence. The main causes of chronic pain are improper body movements and postures which drive the bones and muscles out of balance. From the viewpoint of biological evolution, humans evolved from quadrupedalism to bipedalism. In order to keep balance while standing or walking on two feet in an erect position, the bones and muscles must coordinate with one another; hence, substitution and compensation between the bones and muscles take place to prevent one from tumbling in a standing state or allow one to continue walking in an upright position. The aforesaid substitution and compensation involve interactions between different bones and muscles, and it is these interactions that make possible the various types of improper body movements and postures when one is standing or walking. Such improper movements and postures, in turn, unbalance the bones and muscles and eventually give rise to chronic pain and all kinds of soreness.

[0004] As the chronic pain and soreness mentioned above stem from substitution and compensation within the human body as a whole, no easy medical solution is available, despite the highly developed modern medicine. Neither can the human body itself effectively avoid improper movements or postures to prevent chronic pain and soreness. To alleviate the discomfort caused by chronic pain, it is most desirable that the body weight of a person in a standing position is evenly distributed between the heel and the front part of the sole of each foot, and that consequently the center of pressure of each sole lies at the center of the sole. Only when one's body weight is evenly supported by the feet can the bone and muscle systems maintain neutral balance while standing or walking. Under normal circumstances, however, the center of pressure of a sole in a standing position tends to be located either backward or forward of the center of the sole as a result of shoe design. If the center of pressure is shifted backward, the heel bears a greater part of the body weight and therefore may be painful and cause to wear away the heel of the shoe. If the center of pressure is shifted forward, it is the front part of the sole that bears

a greater part of the body weight, and a forward impetus is generated when walking.

[0005] Conventional solutions to the foregoing problems include adding a post in the shoe structure; making a hole in the heel of a shoe and filling the hole with a soft, resilient material; and putting a well-shaped heel cup in a shoe. These solutions nevertheless tend to apply more force to the heel or sole of a foot and therefore fail to provide effective improvement. A further study reveals that, while the post, the soft material, and the heel cup help adjust improper body movement or posture arising from an uneven distribution of body weight between the heel and the front part of the sole of each foot, they are ineffective in reducing the pressure on the heel or the front part of the sole.

Summary of the Invention

[0006] The invention is a foot balancing device in which a shoe insert is provided with a main balancing element corresponding in position to the gravity center of the user's body while the user is standing and serving as a fulcrum on the shoe insert for the front part of the sole of one of the user's feet and the heel of the foot. The shoe insert is also provided with a plurality of auxiliary force-transferring elements and auxiliary balancing elements to help distribute the user's body weight over the shoe insert in a natural manner. Thus, while the user is standing or walking, his or her body weight will be evenly distributed on the feet, and injuries associated with improper posture are prevented.

[0007] The invention provides a foot balancing device, comprising: a shoe insert having a foot contact surface and a bottom surface, the shoe insert defining a front-of-sole region, an arch region, and a heel region sequentially arranged in a longitudinal direction of the shoe insert; a main balancing element formed as a protuberance in the arch region and serving as a fulcrum on the shoe insert for a front part of the sole of one of a user's feet and the heel of the foot; a first auxiliary force-transferring element formed as a protuberance in the arch region and located rearward of the main balancing element and adjacent to the heel region; a second auxiliary force-transferring element formed as a protuberance in the arch region and located on a line connecting the main balancing element and the first auxiliary force-transferring element; a first auxiliary balancing element formed as a protuberance in the arch region and located forward of the main balancing element in order to support a transverse arch of the foot; a third auxiliary force-transferring element formed as a protuberance in the arch region and located between the first auxiliary balancing element and the main balancing element; a second auxiliary balancing element formed as a protuberance in the arch region and located on a lateral side of the main balancing element in order to support an inner arch of the foot; and a third auxiliary balancing element formed as a protuberance in the arch region and located on an opposite lateral side of the main

balancing element in order to support an outer arch of the foot. The invention also provides a foot balancing device, comprising: a shoe insert having a foot contact surface and a bottom surface, the shoe insert defining a front-of-sole region, an arch region, and a heel region sequentially arranged in a longitudinal direction of the shoe insert; and a main balancing element formed as a protuberance in the arch region and serving as a fulcrum on the shoe insert for a front part of the sole of one of a user's feet and the heel of the foot.

[0008] The implementation of the invention may at least achieve the following improvements:

- (1) allowing the user's body weight to distribute on the feet in a natural manner so that the user can stand or walk in an ideal position; and
- (2) preventing soreness and chronic pain caused by improper posture.

[0009] The detailed features and advantages of the invention are described in the detailed description of the invention for those skilled in the art to understand, make, and use the invention and to easily understand the purposes and advantages of the invention according to the detailed description, claims, and drawings.

Brief Description of the Drawings

[0010] The invention as well as a preferred mode of use, further objectives and advantages thereof will be best understood by reference to the following detailed description of illustrative embodiments when read in conjunction with the accompanying drawings, wherein:

FIG. 1 schematically shows the foot balancing device in an embodiment of the invention;
 FIG. 2 schematically shows how the foot balancing device in FIG. 1 is placed in a shoe;
 FIG. 3 schematically shows the foot balancing device in another embodiment of the invention, wherein the foot balancing device only has the main balancing element;
 FIG. 4 schematically shows the line along which the center of pressure of the sole of a human foot is ideally moved while walking;
 FIG. 5 schematically shows the foot balancing device in FIG. 1 further provided with connecting elements;
 FIG. 6 schematically shows the foot balancing device in yet another embodiment of the invention;
 FIG. 7 schematically shows the foot balancing device in FIG. 6 further provided with connecting elements;
 FIG. 8 schematically shows the foot balancing device in still another embodiment of the invention;
 FIG. 9 schematically shows the foot balancing device in FIG. 8 further provided with connecting elements;
 FIG. 10 schematically shows the foot balancing device in yet another embodiment of the invention;
 FIG. 11 schematically shows the foot balancing de-

vice in FIG. 10 further provided with connecting elements;

FIG. 12 schematically shows the foot balancing device in still another embodiment of the invention; and
 FIG. 13 schematically shows the foot balancing device in FIG. 12 further provided with connecting elements.

Detailed Description of the Invention

[0011] Referring to FIG. 1, the foot balancing device in an embodiment of the invention includes a shoe insert 10, a main balancing element 20, a first auxiliary force-transferring element 31, a second auxiliary force-transferring element 32, a first auxiliary balancing element 41, a third auxiliary force-transferring element 33, a second auxiliary balancing element 42, and a third auxiliary balancing element 43.

[0012] As shown in FIG. 2, the shoe insert 10 can be put into a shoe and functions as a cushioning structure between the sole of a person's foot and the shoe. The shoe insert 10 can be shaped to match the inner bottom surface of the shoe. In addition, the shoe insert 10 has an upper surface defined as a foot contact surface 11 for contact with the bottom surface of a human foot. The shoe insert 10 also has a lower surface defined as a bottom surface 12 for contact with the inner bottom surface of a shoe.

[0013] The shoe insert 10 defines a front-of-sole region 13, an arch region 14, and a heel region 15, which are sequentially arranged in the longitudinal direction of the shoe insert 10. When the sole of a human foot is in contact with the shoe insert 10, the front-of-sole region 13 of the shoe insert 10 corresponds in position to the front part of the sole; the arch region 14, to an arch of the foot; and the heel region 15, to the heel of the foot. Referring to FIG. 1 and FIG. 2, the main balancing element 20; the first, second, and third auxiliary force-transferring elements 31, 32, 33; and the first, second, and third auxiliary balancing elements 41, 42, 43 are protuberances with a convex, circular, semicircular, or irregular surface. The main balancing element 20; the auxiliary force-transferring elements 31, 32, 33; and the auxiliary balancing elements 41, 42, 43 can be provided on the foot contact surface 11 or the bottom surface 12 of the shoe insert 10. As a healthy human foot in a standing position is typically supported at three points, namely the first and fifth metatarsal bones and the heel, and a foot arch tends to lack effective support because of its upwardly curved structure, the main balancing element 20; the auxiliary force-transferring elements 31, 32, 33; and the auxiliary balancing elements 41, 42, 43 are all provided in the arch region 14 of the shoe insert 10 to help a user adopt a balanced, proper posture naturally while standing or walking.

[0014] As shown in FIG. 3, the main balancing element 20 is located at a geometric center between a first metatarsal bone point P1, a fifth metatarsal bone point P2,

and a heel point P3 of the shoe insert 10, wherein the first metatarsal bone point P1 corresponds in position to the first metatarsal bone of the foot; the fifth metatarsal bone point P2, to the fifth metatarsal bone of the foot; and the heel point P3; to the heel of the foot. Thus, the main balancing element 20 is located at the gravity center of a human body while he or she is standing and can be used as a fulcrum on the shoe insert 10 for the front part of the sole of a foot and the heel of the foot. In practice, it is feasible that the shoe insert 10 is provided only with the main balancing element 20.

[0015] FIG. 4 schematically shows a line L along which the center of pressure of the sole of a human foot is ideally moved while walking. As a person walking on two feet lands the heel of the forward moving foot first, the gravity center of the person's body is moved in such a way that the center of pressure of the sole of the landing foot is displaced from the heel toward the toes. More particularly, the center of pressure first appears in an outer corner of the heel, then moves forward toward the toes, turns inward at a position adjacent to the fifth metatarsal bone, moves to the vicinity of the first metatarsal bone, and turns again toward the tip of the big toe, where the center of pressure disappears.

[0016] One who is walking with the center of pressure of each sole following the ideal line L has their body in the ideal walking state and can keep a proper posture while walking. By placing the main balancing element 20 at the geometric center between the first metatarsal bone point P1, the fifth metatarsal bone point P2, and the heel point P3, as shown in FIG. 3, it is ensured that the main balancing element 20 is located at the gravity center of the user's body while the user is standing and functions as an intermediate fulcrum between the heel and the front part of the sole while the user is walking, wherein the heels lands earlier than the front part of the sole.

[0017] In addition, the first, second, and third auxiliary force-transferring elements 31, 32, 33 are provided around the main balancing element 20 to facilitate displacement of the aforesaid center of pressure while the user is walking and consequently shifting the gravity center of his or her body. With the assistance of the auxiliary force-transferring elements 31, 32, 33, the user's body can maintain neutral balance in a natural manner, without improper movement or posture, thereby preventing soreness and chronic pain. Moreover, the first, second, and third auxiliary balancing elements 41, 42, 43 are provided to support a transverse arch, an inner arch, and an outer arch of a foot respectively so that the arch is firmly supported.

[0018] Referring back to FIG. 1, the first auxiliary force-transferring element 31 is provided rearward of the main balancing element 20 and is adjacent to the heel region 15, the second auxiliary force-transferring element 32 is provided on a line connecting the main balancing element 20 and the first auxiliary force-transferring element 31, the first auxiliary balancing element 41 is provided forward of the main balancing element 20 to support the

transverse arch of a foot, the third auxiliary force-transferring element 33 is provided between the first auxiliary balancing element 41 and the main balancing element 20, the second auxiliary balancing element 42 is provided on one lateral side of the main balancing element 20 to support the inner arch, and the third auxiliary balancing element 43 is provided on the opposite lateral side of the main balancing element 20 to support the outer arch.

[0019] As shown in FIG. 1, the main balancing element 20; the first, second, and third auxiliary force-transferring elements 31, 32, 33; and the first, second, and third auxiliary balancing elements 41, 42, 43 can be provided on the shoe insert 10 all at once. Optionally, as shown in FIG. 5, connecting elements 50 can be provided to connect the adjacent ones of the main balancing element 20; the first, second, and third auxiliary force-transferring elements 31, 32, 33; and the first, second, and third auxiliary balancing elements 41, 42, 43. That is to say, one connecting element 50 can be provided between the main balancing element 20 and each of the second auxiliary force-transferring element 32, the third auxiliary force-transferring element 33, the second auxiliary balancing element 42, and the third auxiliary balancing element 43; between the first auxiliary force-transferring element 31 and the second auxiliary force-transferring element 32; and between the first auxiliary balancing element 41 and the third auxiliary force-transferring element 33. In that case, the main balancing element 20; the first, second, and third auxiliary force-transferring elements 31, 32, 33; and the first, second, and third auxiliary balancing elements 41, 42, 43 are connected as a single unit and can be viewed as a single protuberant structure.

[0020] Apart from the structures described above, it is feasible to use only three of the foregoing protuberances to help a user maintain body balance. For example, referring to FIG. 6, the shoe insert 10 is provided only with the main balancing element 20, the first auxiliary force-transferring element 31, and the first auxiliary balancing element 41. Optionally, referring to FIG. 7, one connecting element 50 can be provided between the main balancing element 20 and each of the first auxiliary force-transferring element 31 and the first auxiliary balancing element 41 so that the main balancing element 20, the first auxiliary force-transferring element 31, and the first auxiliary balancing element 41 are connected as a single unit.

[0021] Alternatively, referring to FIG. 8, it is feasible that the shoe insert 10 is provided only with the main balancing element 20 and two auxiliary balancing elements 42, 43. In that case, the main balancing element 20 serves as a fulcrum for the front part of the sole of a user's foot and the heel of the foot while the auxiliary balancing elements 42, 43 support an inner arch and an outer arch respectively. Optionally, as shown in FIG. 9, one connecting element 50 can be provided between the main balancing element 20 and each of the two auxiliary balancing elements 42, 43 so that the main balancing

element 20 and the two auxiliary balancing elements are connected as a single unit.

[0022] It is also feasible to use only five of the foregoing protuberances to help a user maintain body balance. For instance, as shown FIG. 10, only the main balancing element 20, the first auxiliary force-transferring element 31, the second auxiliary force-transferring element 32, the third auxiliary force-transferring element 33, and the first auxiliary balancing element 41 are provided. In that case, the main balancing element 20 serves as a fulcrum for the front part of the sole of a user's foot and the heel of the foot, the first auxiliary balancing element 41 is located forward of the main balancing element 20 to support a transverse arch, the first auxiliary force-transferring element 31 is located rearward of the main balancing element 20 and adjacent to the heel region, the second auxiliary force-transferring element 32 is located on a line connecting the main balancing element 20 and the first auxiliary force-transferring element 31, and the third auxiliary force-transferring element 33 is located between the first auxiliary balancing element 41 and the main balancing element 20.

[0023] Optionally, referring to FIG. 11, an appropriate number of connecting elements 50 can be provided between the main balancing element 20, the first auxiliary force-transferring element 31, the second auxiliary force-transferring element 32, the third auxiliary force-transferring element 33, and the first auxiliary balancing element 41 to connect them together.

[0024] Referring to FIG. 12, it is also feasible that only the main balancing element 20, the first auxiliary force-transferring element 31, the first auxiliary balancing element 41, the second auxiliary balancing element 42, and the third auxiliary balancing element 43 are provided. In that case, the main balancing element 20 functions as a fulcrum for the front part of the sole of a user's foot and the heel of the foot, the first auxiliary force-transferring element 31 is located rearward of the main balancing element 20 and adjacent to the heel region, the first auxiliary balancing element 41 is located forward of the main balancing element 20 to support a transverse arch of the foot, and the second auxiliary balancing element 42 and the third auxiliary balancing element 43 are respectively located on two lateral sides of the main balancing element 20 to support an inner arch and an outer arch of the foot respectively.

[0025] Optionally, as shown in FIG. 13, an appropriate number of connecting elements 50 can be provided between the main balancing element 20, the first auxiliary force-transferring element 31, the first auxiliary balancing element 41, the second auxiliary balancing element 42, and the third auxiliary balancing element 43 so that main balancing element 20, the first auxiliary force-transferring element 31, the first auxiliary balancing element 41, the second auxiliary balancing element 42, and the third auxiliary balancing element 43 are connected as a single unit.

[0026] The foot balancing device in each of the foregoing and other embodiments of the invention can be

used in various kinds of shoes and is adaptive to the foot shapes of the general public. By disposing the main balancing element 20 at a geometric center between the first metatarsal bone point P1, the fifth metatarsal bone point P2, and the heel point P3 of the shoe insert 10, the main balancing element 20 is located at the gravity center of a human body while he or she is standing and serves as a fulcrum on the shoe insert 10 for the front part of the sole of a foot and the heel of the foot. Moreover, the cross-sectional area of the main balancing element 20 can be greater than those of the auxiliary force-transferring elements 31, 32, 33 and the auxiliary balancing elements 41, 42, 43.

[0027] Besides, the relative positions of the auxiliary force-transferring elements 31, 32, 33 can be fine-tuned so that an ideal gait pattern can be achieved, and body balance maintained, as the gravity center of the body is displaced during walking. The auxiliary balancing elements 41, 42, 43, on the other hand, provide support for a transverse arch, inner arch and outer arch of the foot and help distribute the pressure on the foot for increased comfort.

[0028] The embodiments described above demonstrate that the main balancing element 20 can be used alone or in combination with different numbers of auxiliary force-transferring elements 31, 32, 33 and/or auxiliary balancing elements 41, 42, 43 according to practical needs, and whether seven, five, three, or only one of the disclosed protuberances is used, the foot balancing device of the invention is equally effective in keeping body balance and providing optimal torque of the foot during walking, thereby maintaining dynamic as well as static equilibrium and comfort and noticeably alleviating soreness and chronic pain caused by improper posture.

[0029] The embodiments described above are intended only to demonstrate the technical concept and features of the invention so as to enable a person skilled in the art to understand and implement the contents disclosed herein. It is understood that the disclosed embodiments are not to limit the scope of the invention. Therefore, all equivalent changes or modifications based on the concept of the invention should be encompassed by the appended claims.

Claims

1. A foot balancing device, comprising:

- a shoe insert (10) having a foot contact surface (11) and a bottom surface (12), the shoe insert (10) defining a front-of-sole region (13), an arch region (14), and a heel region (15) sequentially arranged in a longitudinal direction of the shoe insert (10);
- a main balancing element (20) formed as a protuberance in the arch region (14) and serving as a fulcrum on the shoe insert (10) for a front part

- of the sole of one of a user's feet and the heel of the foot;
 a first auxiliary force-transferring element (31) formed as a protuberance in the arch region (14) and located rearward of the main balancing element (20) and adjacent to the heel region (15);
 a second auxiliary force-transferring element (32) formed as a protuberance in the arch region (14) and located on a line connecting the main balancing element (20) and the first auxiliary force-transferring element (31);
 a first auxiliary balancing element (41) formed as a protuberance in the arch region (14) and located forward of the main balancing element (20) in order to support a transverse arch of the foot;
 a third auxiliary force-transferring element (33) formed as a protuberance in the arch region (14) and located between the first auxiliary balancing element (41) and the main balancing element (20);
 a second auxiliary balancing element (42) formed as a protuberance in the arch region (14) and located on a lateral side of the main balancing element (20) in order to support an inner arch of the foot; and
 a third auxiliary balancing element (43) formed as a protuberance in the arch region (14) and located on an opposite lateral side of the main balancing element (20) in order to support an outer arch of the foot.
2. The foot balancing device of claim 1, wherein the main balancing element (20) is located at a geometric center between a first metatarsal bone point (P1), a fifth metatarsal bone point (P2), and a heel point (P3) of the shoe insert (10), wherein the first metatarsal bone point (P1) corresponds in position to the first metatarsal bone of the foot, the fifth metatarsal bone point (P2) corresponds in position to the fifth metatarsal bone of the foot, and the heel point (P3) corresponds in position to the heel of the foot.
 3. The foot balancing device of claim 2, wherein the main balancing element (20) is provided on the foot contact surface (11) or the bottom surface (12).
 4. The foot balancing device of claim 3, wherein the main balancing element (20), the first auxiliary force-transferring element (31), the second auxiliary force-transferring element (32), the first auxiliary balancing element (41), the third auxiliary force-transferring element (33), the second auxiliary balancing element (42), and the third auxiliary balancing element (43) are connected as a single unit by connecting elements (50) provided between adjacent ones of the main balancing element (20), the first auxiliary force-transferring element (31), the second auxiliary force-transferring element (32), the first auxiliary balancing element (41), the third auxiliary force-transferring element (33), the second auxiliary balancing element (42), and the third auxiliary balancing element (43).
 5. A foot balancing device, comprising:
 - a shoe insert (10) having a foot contact surface (11) and a bottom surface (12), the shoe insert (10) defining a front-of-sole region (13), an arch region (14), and a heel region (15) sequentially arranged in a longitudinal direction of the shoe insert (10); and
 - a main balancing element (20) formed as a protuberance in the arch region (14) and serving as a fulcrum on the shoe insert (10) for a front part of the sole of one of a user's feet and the heel of the foot.
 6. The foot balancing device of claim 5, wherein the main balancing element (20) is located at a geometric center between a first metatarsal bone point (P1), a fifth metatarsal bone point (P2), and a heel point (P3) of the shoe insert (10), wherein the first metatarsal bone point (P1) corresponds in position to the first metatarsal bone of the foot, the fifth metatarsal bone point (P2) corresponds in position to the fifth metatarsal bone of the foot, and the heel point (P3) corresponds in position to the heel of the foot.
 7. The foot balancing device of claim 6, wherein the main balancing element (20) is provided on the foot contact surface (11) or the bottom surface (12).
 8. The foot balancing device of claim 7, further comprising a first auxiliary force-transferring element (31) and a first auxiliary balancing element (41), wherein the first auxiliary force-transferring element (31) is formed as a protuberance in the arch region (14) and is located rearward of the main balancing element (20) and adjacent to the heel region (15), and the first auxiliary balancing element (41) is formed as a protuberance in the arch region (14) and is located forward of the main balancing element (20) in order to support a transverse arch of the foot.
 9. The foot balancing device of claim 8, wherein the main balancing element (20), the first auxiliary force-transferring element (31), and the first auxiliary balancing element (41) are connected as a single unit by a connecting element (50) provided between the main balancing element (20) and each of the first auxiliary force-transferring element (31) and the first auxiliary balancing element (41).
 10. The foot balancing device of claim 7, further comprising two auxiliary balancing elements (42, 43) which are formed as protuberances in the arch re-

gion (14) and which are located on two lateral sides of the main balancing element (20) respectively in order to support an inner arch and an outer arch of the foot respectively.

11. The foot balancing device of claim 10, wherein the main balancing element (20) and the auxiliary balancing elements (42, 43) are connected as a single unit by a connecting element (50) provided between the main balancing element (20) and each of the auxiliary balancing elements (42, 43).

12. The foot balancing device of claim 7, further comprising a first auxiliary force-transferring element (31), a second auxiliary force-transferring element (32), a third auxiliary force-transferring element (33), and a first auxiliary balancing element (41), wherein the first auxiliary force-transferring element (31) is formed as a protuberance in the arch region (14) and is located rearward of the main balancing element (20) and adjacent to the heel region (15), the second auxiliary force-transferring element (32) is formed as a protuberance in the arch region (14) and is located on a line connecting the main balancing element (20) and the first auxiliary force-transferring element (31), the first auxiliary balancing element (41) is formed as a protuberance in the arch region (14) and is located forward of the main balancing element (20) in order to support a transverse arch of the foot, and the third auxiliary force-transferring element (33) is formed as a protuberance in the arch region (14) and is located between the first auxiliary balancing element (41) and the main balancing element (20).

13. The foot balancing device of claim 12, wherein the main balancing element (20), the first auxiliary force-transferring element (31), the second auxiliary force-transferring element (32), the third auxiliary force-transferring element (33), and the first auxiliary balancing element (41) are connected as a single unit by connecting elements (50) provided between adjacent ones of the main balancing element (20), the first auxiliary force-transferring element (31), the second auxiliary force-transferring element (32), the third auxiliary force-transferring element (33), and the first auxiliary balancing element (41).

14. The foot balancing device of claim 7, further comprising a first auxiliary force-transferring element (31), a first auxiliary balancing element (41), a second auxiliary balancing element (42), and a third auxiliary balancing element (43), wherein the first auxiliary force-transferring element (31) is formed as a protuberance in the arch region (14) and is located rearward of the main balancing element (20) and adjacent to the heel region (15), the first auxiliary balancing element (41) is formed as a protuberance in the arch region (14) and is located forward of the

main balancing element (20) in order to support a transverse arch of the foot, and the second auxiliary balancing element (42) and the third auxiliary balancing element (43) are formed as protuberances in the arch region (14) and are located on two lateral sides of the main balancing element (20) respectively in order to support an inner arch and an outer arch of the foot respectively.

15. The foot balancing device of claim 14, wherein the main balancing element (20), the first auxiliary force-transferring element (31), the first auxiliary balancing element (41), the second auxiliary balancing element (42), and the third auxiliary balancing element (43) are connected as a single unit by connecting elements (50) provided between adjacent ones of the main balancing element (20), the first auxiliary force-transferring element (31), the first auxiliary balancing element (41), the second auxiliary balancing element (42), and the third auxiliary balancing element (43).

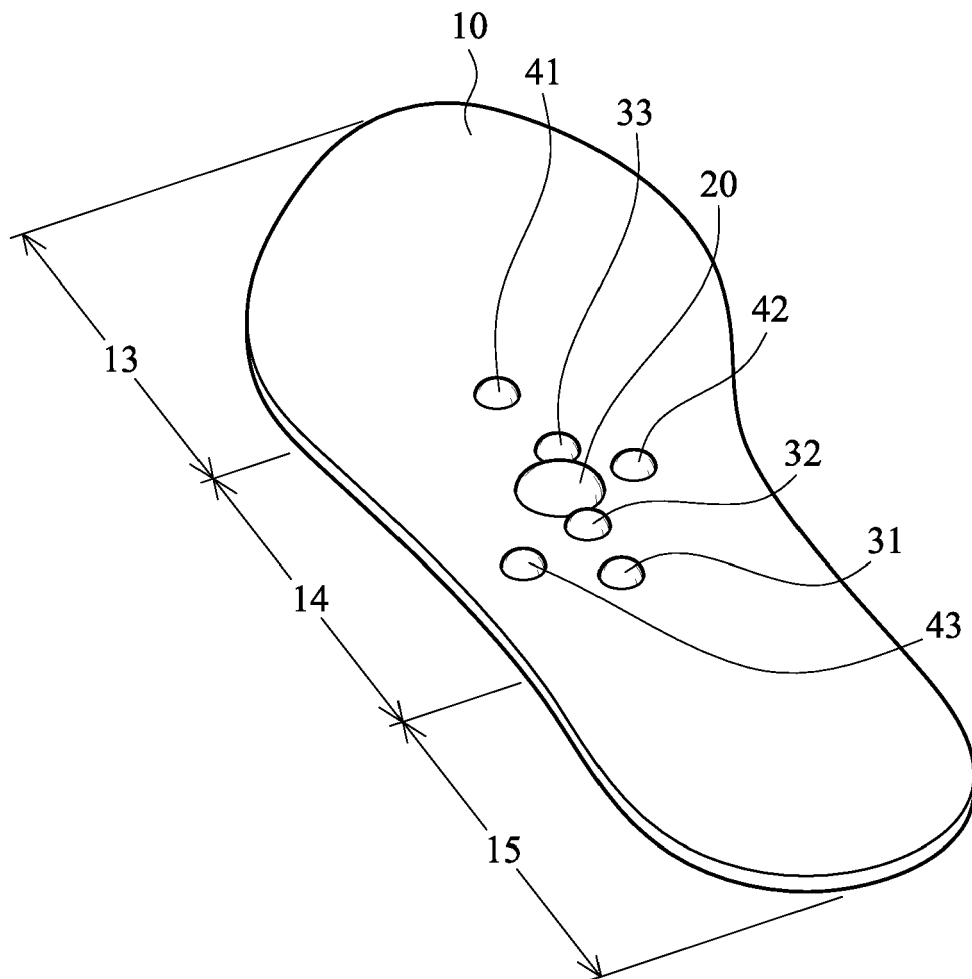
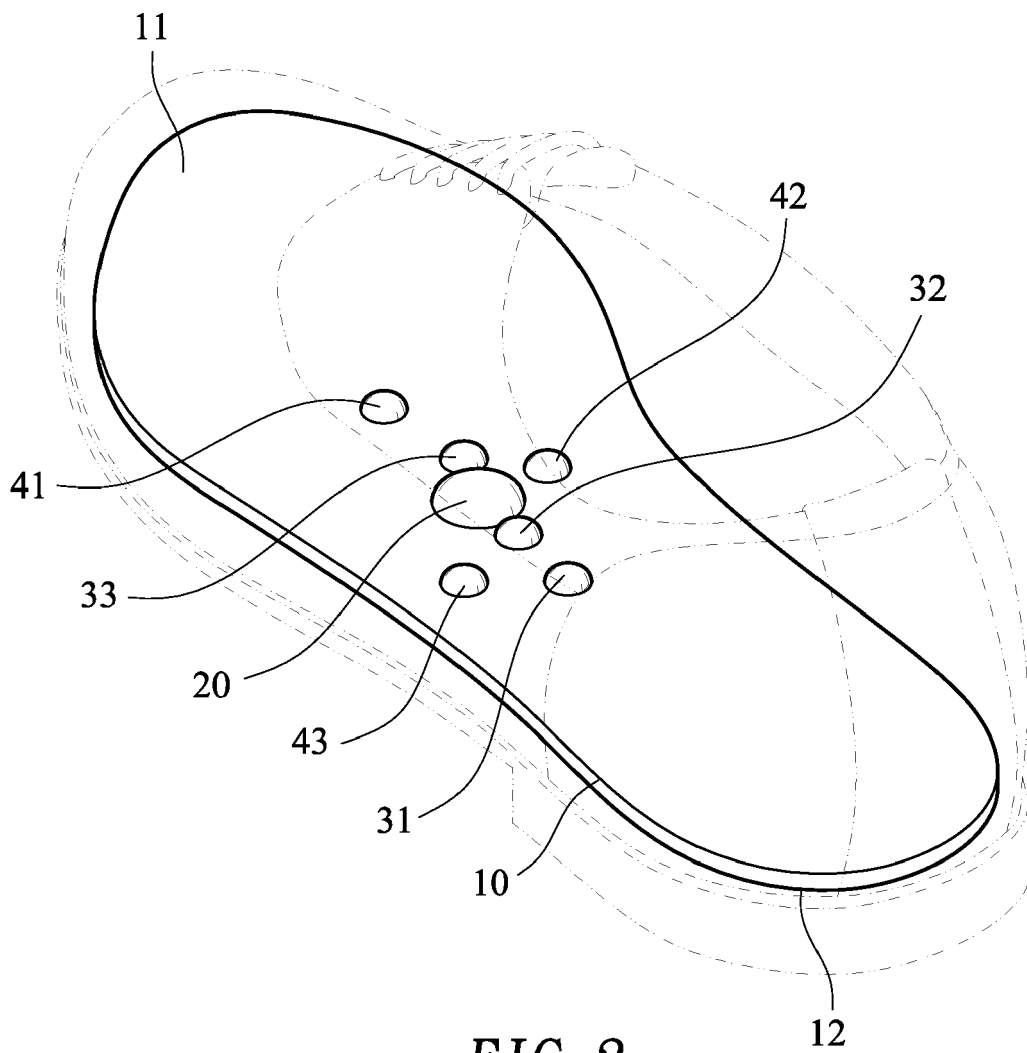


FIG. 1



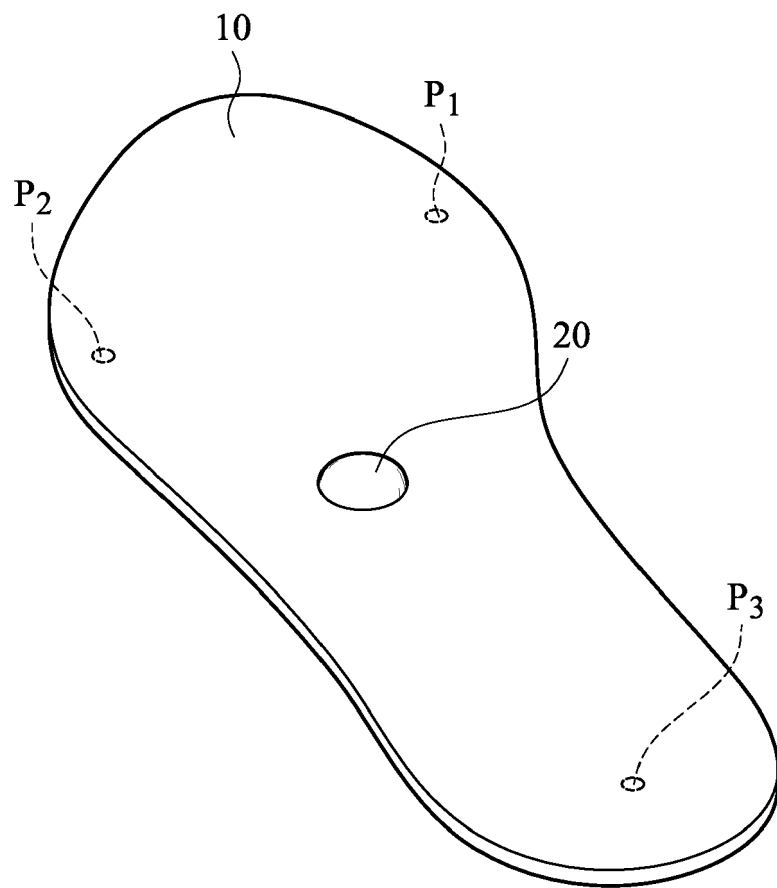


FIG. 3

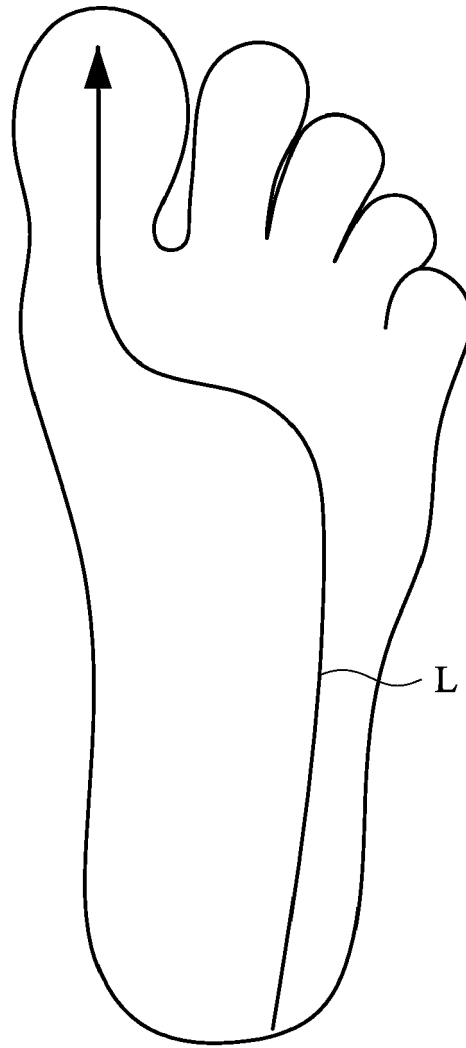


FIG. 4

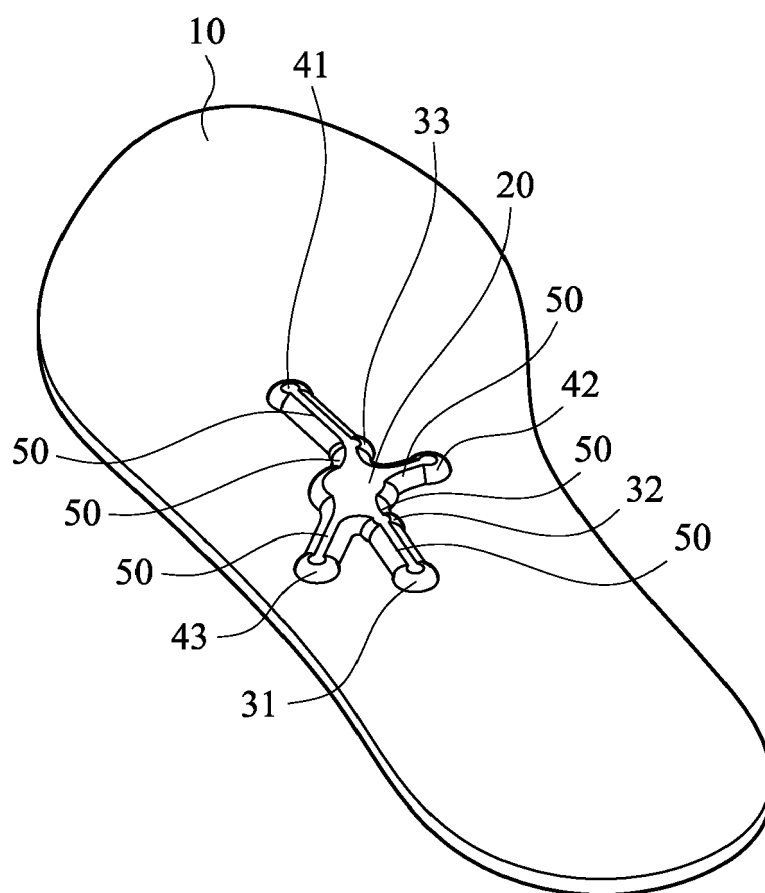


FIG. 5

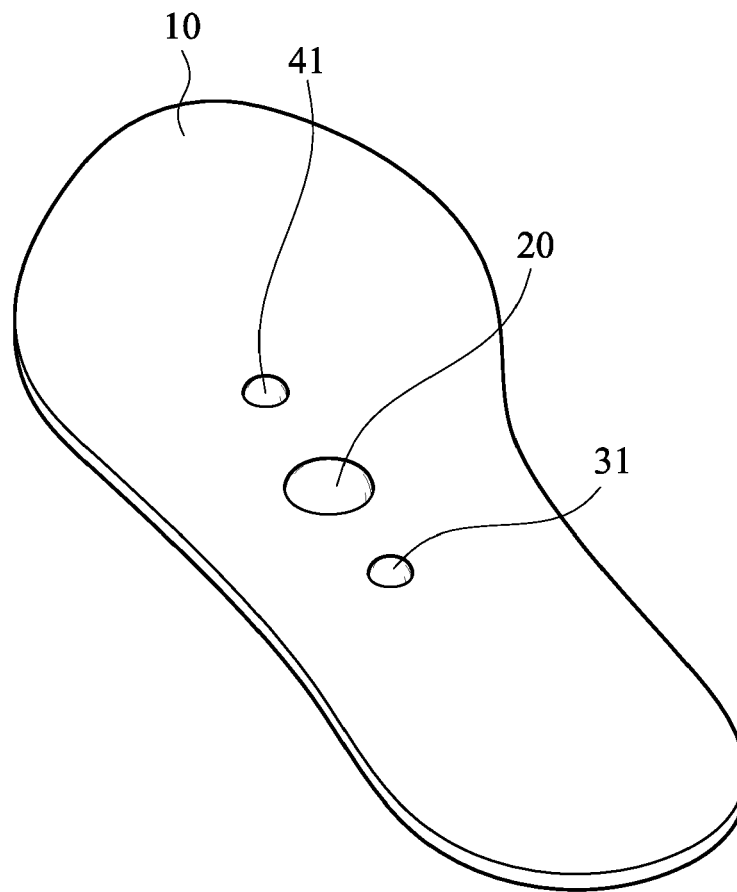


FIG. 6

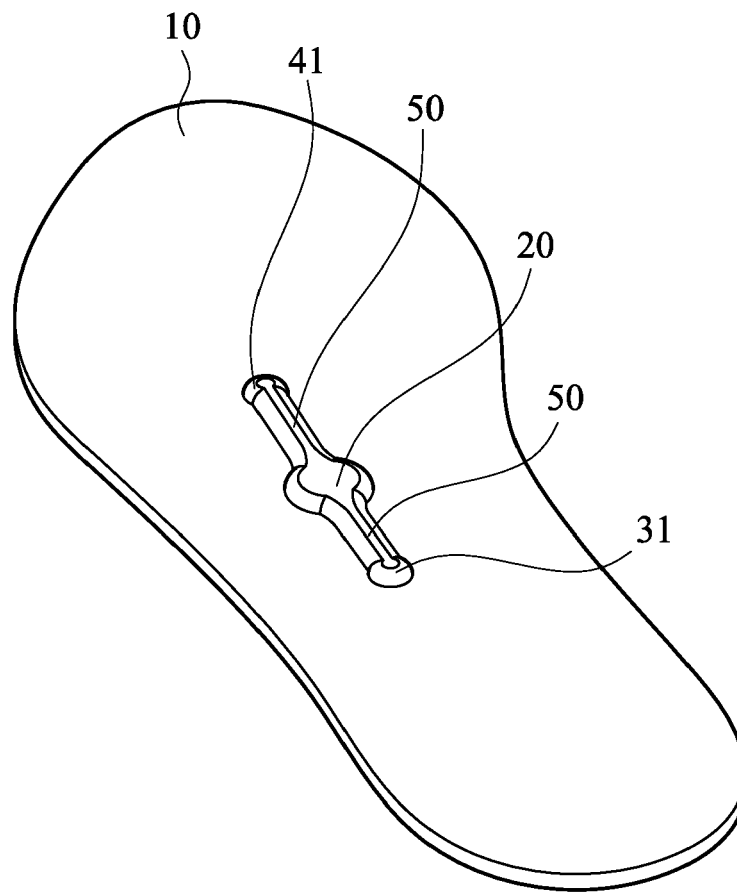


FIG. 7

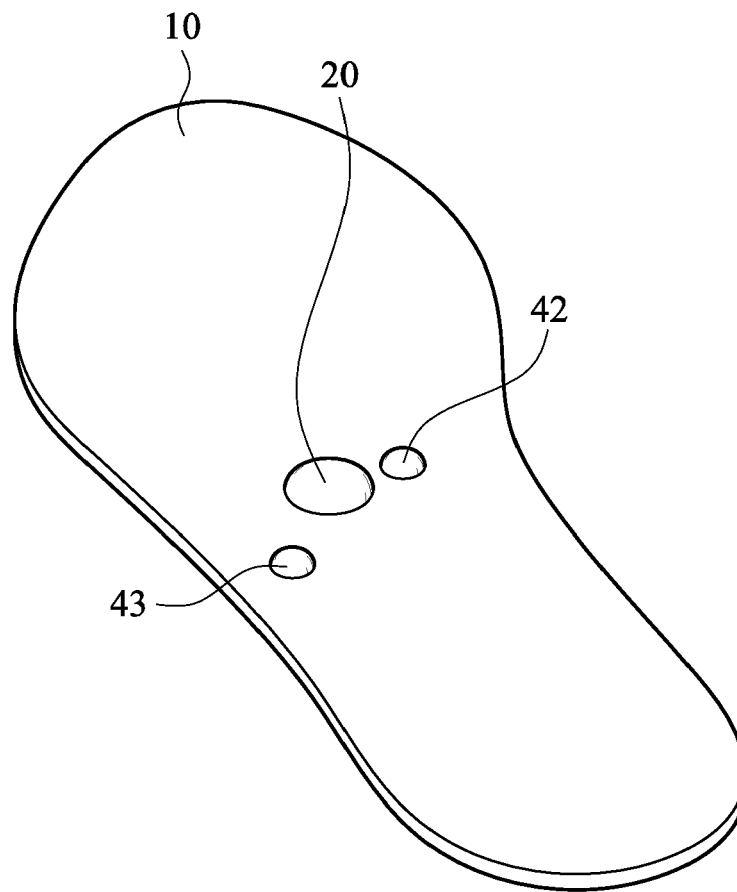


FIG. 8

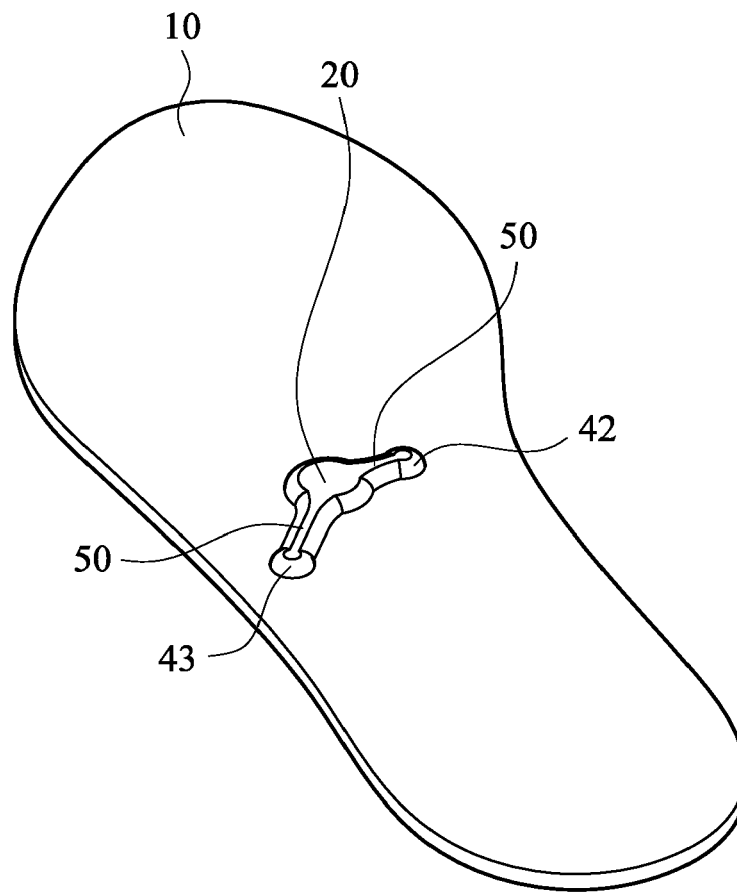


FIG. 9

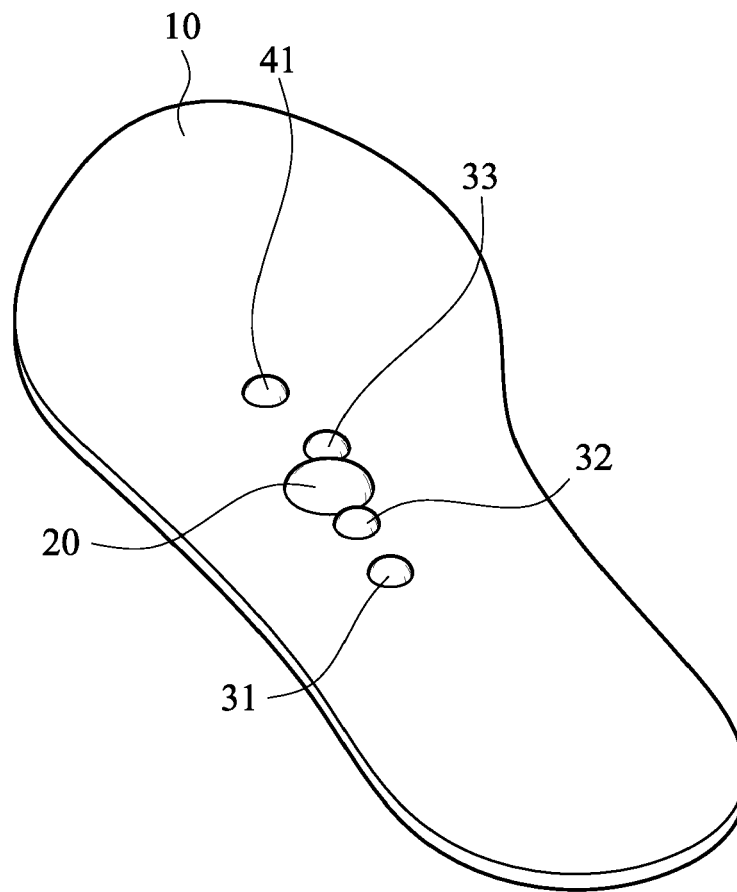


FIG. 10

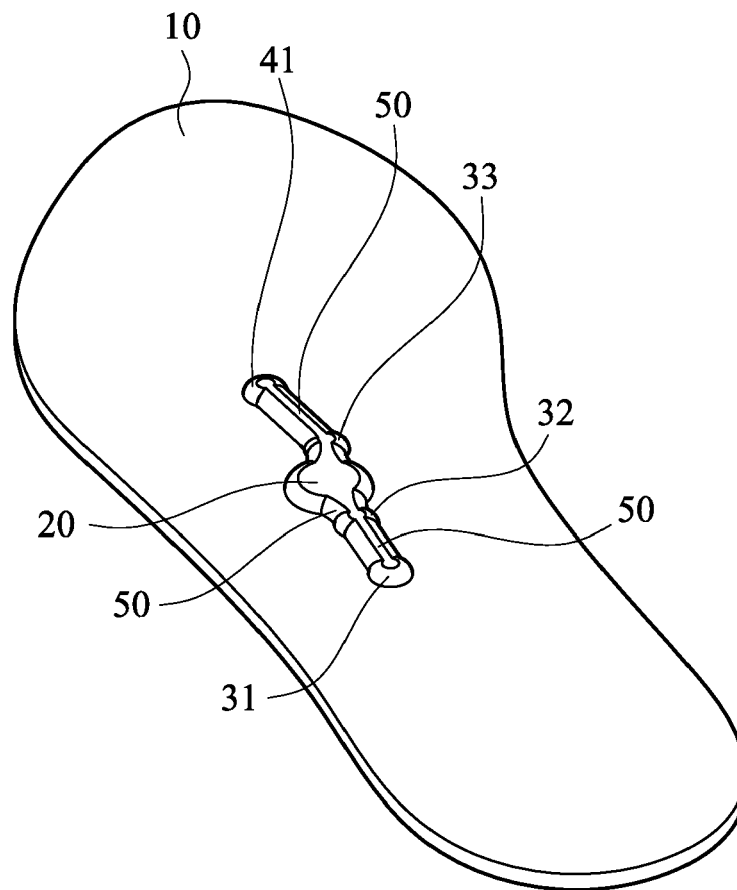


FIG. 11

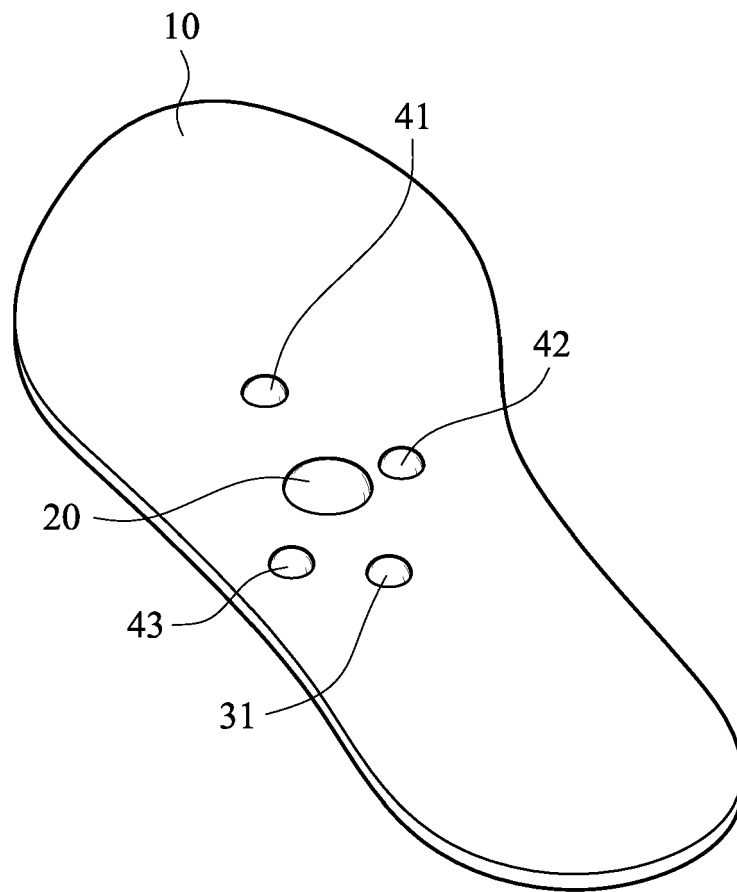


FIG. 12

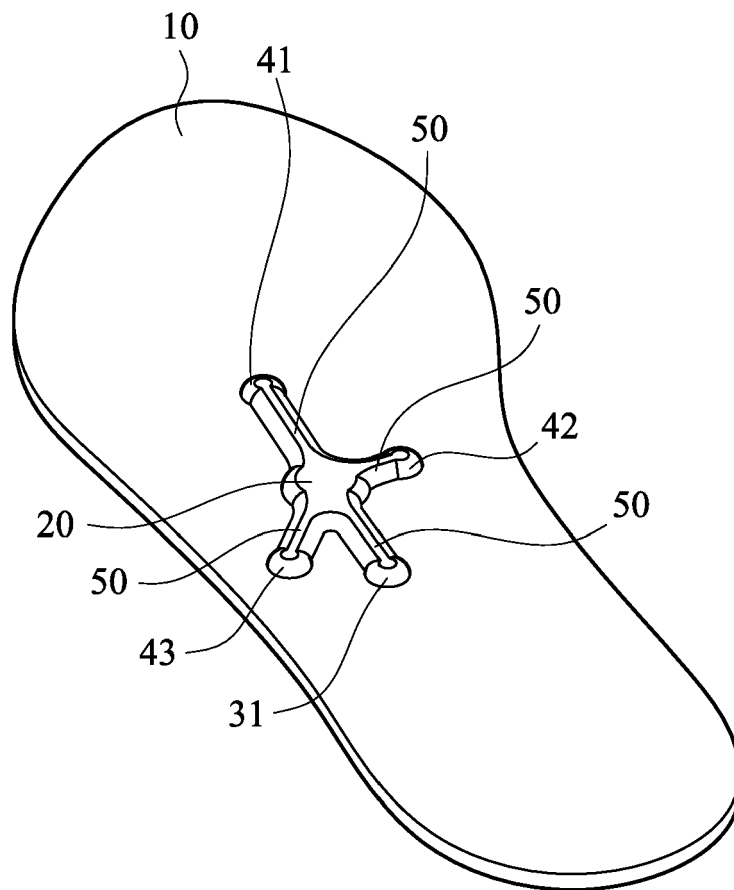


FIG. 13



EUROPEAN SEARCH REPORT

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Place of search The Hague		Date of completion of the search 20 June 2016	Examiner Clausel, Benoît
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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