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(54) **MULTI-PURPOSE WATER SHOE**

(57) Multi-purpose footwear comprising a sole, a shoe tongue and a shoe vamp as a portion of the shoe upper and one or more paddle portions mounted so as

to be displaceable to two or more alternative and predetermined positions with respect to said shoe.

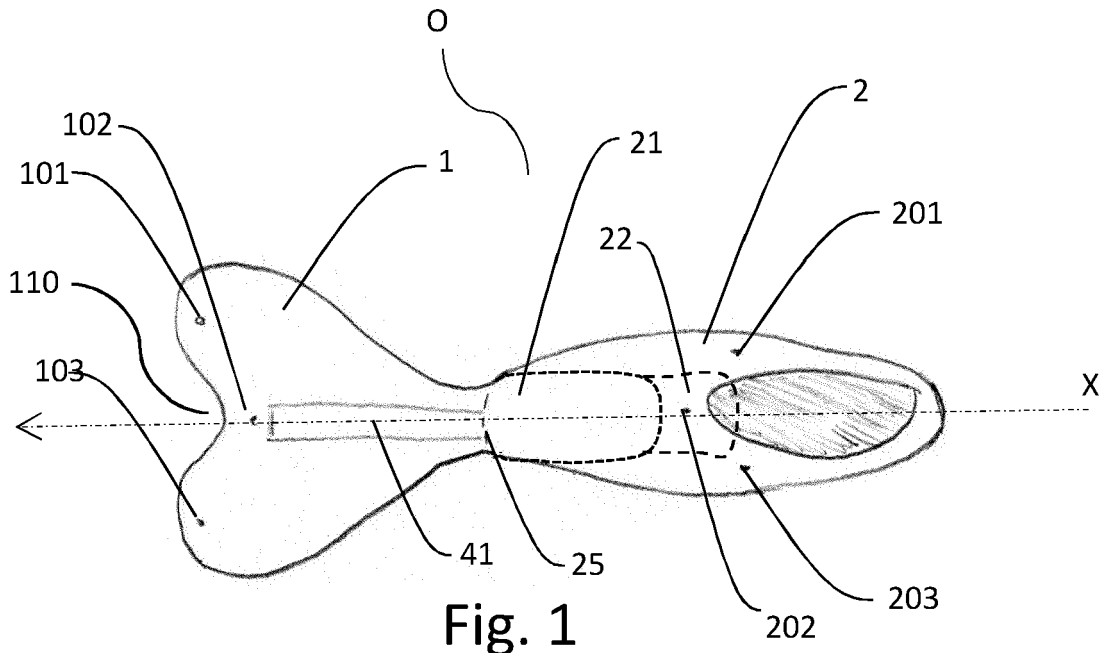


Fig. 1

Description

TEXT OF THE DESCRIPTION

[0001] Object of the present invention is a shoe suitable both for use on dry land and for use in water activities where swim fins are traditionally used. A feature of the invention is also the simplicity and ease of reconversion of this shoe between the two ways of use described above simply and quickly without having to slip it off from the user's foot.

[0002] Swim fins, which are made in a very wide variety of shapes and sizes, are sorted, among other things, into two main families, that is to say the one of full-foot fins, in which the user's foot is completely inserted up to the heel into a suitable housing and the one of the open-heel fins, in which only the user's forefoot enters a cavity suitably arranged in the fin, while the heel is surrounded by retaining devices such as, for example, a strap connected to the foot-pocket sides and provided with a portion or element, named heel element, right suitable to accommodate the user's heel.

[0003] In the full-foot fins, the shoe portion extends in the heel area as well, like a traditional shoe, an upper opening for the introduction of the foot being provided. The introduction of the foot takes place thanks to the elasticity of the material the shoe is made of, particularly in the part of the upper.

[0004] Thanks to the elasticity of the material and since generally the area of the front toe of the shoe is made open, there is no need to make a fin for each foot size, but the shoes of the fins can fit different foot sizes without affecting the comfort of use to different foot sizes. On the other hand, the other type of fins provides that the shoe is opened at least in the back, so that the part of the heel is completely missing so that a pocket for the foot is formed.

[0005] Clearly, the two different types of fins address to very different uses; full-foot fins normally address to the user who practices snorkeling or underwater fishing, where it is important to control the fin movement whereas it is not essential to have the ability to wear dive boots to protect the feet from cold. On the other hand, this last necessity becomes very important when practicing scuba diving to even considerable depths, being therefore advisable to reduce as much as possible the heat loss from the diver's body. However, the use of dive boots actually prevents the adoption of full-foot fins, which are generally designed to best adapt to the shape of the naked foot and would tend to slip away when another interposed material is present.

[0006] As part of the activity of swimming on the surface or underwater, the fin is used as a device to facilitate the motion of the user who, thanks to it, since the limbs apply the thrust on a greater surface, is able to displace a greater amount of water from the lower limbs and then, by reaction, to swim faster and be in general more effective in moving.

[0007] Therefore, in common embodiments, the fin is designed to work in contact with the liquid when worn by the user in said liquid, commonly fresh or salt water. Aside from diving activities, both partially and totally underwater, the paddle, i.e. the front extension of the shoe, is an obstacle for the diver if he/she needs to move outside the water: we can consider, for example, movements on dry land, aboard a boat or when climbing or descending ladders just before or after diving phases. The fin paddle does not allow the foot that wears it to be positioned within small spaces and, in addition, the paddle itself is an obstacle to the natural movement of the lower limbs of a person who is walking.

[0008] The obstacle to movement not only results in discomfort for the user, but also in risk for his health if he encounters situations in which the foot stumbles or becomes stuck during the aforementioned operations other than in-water operations.

[0009] The discomfort for the user occurs for example also in the case of intermittent use in water, as in case of a person who often gets in and out of water, spends time both in the water and on the beach, or if to reach the water he is required to walk on slippery and impervious areas, such as rocks before entering the water, where it is difficult not only to wear the fin but also to walk with the fin already worn.

[0010] US6102336 describes a known device that allows these limitations to be overcome: the object of the art comprises an assembly consisting of a paddle and a shoe made as separate elements and mechanically connected by means of a supporting structure comprising a pin cooperating with paddle and shoe. All the parts together allow the paddle to tilt around the axis of the pin by up to 45° at predefined intervals of 5°, so that the paddle can be lifted from the ground and brought closer to the body of the wearer who is therefore facilitated when walking on land.

[0011] CN200970443Y describes another known device also intended to lift the paddle towards the user's tibia and comprising, as part of the same paddle, a pulley that is slidingly positioned in the sole of the fin. The paddle is held in the open position by means of a locking connection and held in the closed position, towards the user's tibia, by a belt with a buckle that must be worn at an appropriate height thereby constraining the high portion of the tibia with the paddle and generating, as a matter of fact, a criticality in the articulated movements of the leg and foot of the user who is walking.

[0012] US6672920 also describes a fin with adjustable paddle made by means of an at least partially rigid boot provided with hooking elements which derive from applications for skiing activities, said hooking elements being positioned substantially near the ankle of the wearing foot and being responsible for rotating and keeping the paddle to positions comprising both a position substantially level with the sole and a raised position near the fibula of the user.

[0013] The known art described in these documents,

which introduces the possibility of altering the position of the paddle with respect to the shoe by locking it in predetermined positions, is implemented by articulated mechanisms such as pins, pulleys and hooking elements that generate high complexity and only partially solve the problem of the bulk of the paddle when the latter is in the closed position or anyway in a position different from the in-water operating position.

[0014] Object of the invention is therefore to create a multi-purpose shoe able to limit the discomfort of the user when he is not engaged in in-water activities, while maintaining the functional efficiency of water displacement and therefore the thrust said user applies during swimming.

[0015] It is also an object of the invention to provide a device that can be easily and quickly converted from an in-water mode of action to an out-of-water mode of action, in embodiments that are resistant, light, practical to make and use.

[0016] In some preferred embodiments, one of which will be described below, the invention makes it possible to produce wearable fins with a paddle that is able to be folded or in any case relocated in a position so as not to hinder the user's movements out of the water, for example when he is on dry land or aboard a ship or when climbing or descending stairs. Advantageously, the object is achieved without involving jointed mechanisms or articulated apparatuses that would inevitably be subject to deterioration phenomena in the aquatic and/or marine environment such as oxidation, erosion, corrosion or accumulation formations close to said mechanisms as a result of use in water such as saltpeter, chlorine and ozone.

[0017] Thus, the invention solves the above mentioned limitations by means of a swim fin with a shoe comprising a sole, a tongue and a shoe vamp as a portion of the shoe upper and one or more portions of the paddle which are mounted so as to be displaceable to two or more predetermined positions with respect to said shoe.

[0018] Depending on the embodiments, the paddle in question may be made either in one piece or by combining sub-pieces whose assembly generates, in combination with said shoe, a body capable of meeting the swimming and/or buoyancy aid purposes pertaining to swim fins. Hereinafter, unless otherwise mentioned, the term "paddle" can refer both to the form in a single piece and the form of combined sub-pieces, without affecting the purposes and functionality of the finding.

[0019] In the description, areas or parts of said fin can be referred to identifying them by means of surface or volume references: for clarity of explanation, the fin is intended as worn by the user in an upright position on the dry land while walking forward; as a result, the paddle is located in the front portion of the fin, the sole in the bottom portion and so on.

[0020] Therefore, the invention takes the form of a swim fin for a user or diver who wears it by putting it on the individual foot by means of the shoe, the shoe being

mated to the paddle and the resulting shape being able to improve the hydrodynamic thrust of the lower limbs of the user submerged in water.

[0021] It is possible to identify some important parts composing the shoe, which can be partially opened as previously described, including:

- the sole, i.e. the bottom portion of the shoe;
- the upper, the main body of the shoe mated to the sole and fully or partially wrapping the user's foot;
- the vamp, the central portion of the shoe that covers the instep;
- the tongue, the top portion of the vamp near the foot inlet.

[0022] The invention is characterized by a paddle that can take more than one predetermined position, that is, at least one additional shoe-paddle configuration with respect to the position of the known-in-the-art fins, in which the sole and paddle lie substantially on the same plane when at rest, i.e. when they are not stressed by outer forces such as those resulting from the movement of the user in water.

[0023] Although this configuration is suitable for diving exercise, it hinders the out-of-water movements of a user who is wearing it and is engaged with one or more actions normally carried out on the ground, such as walking a staircase or walking on the surface; the invention overcomes these limitations by providing a fin whose paddle can be positioned so as not to hinder the movements on the dry land, while being able to be simply and quickly repositioned by the user in order to achieve the purposes of aiding the thrust when the same user is near or even submerged in water.

[0024] The person who wears a fin-shoe having the features of the finding is therefore able to walk on the shore or on the rocks without forgoing a fin to aid aquatic activity. Thus, a user often getting in and out of water and/or spending time both in the water and on the beach, does not have to change footwear every time he changes environment but he simply have to change the fin position.

[0025] As a result of another advantage of the present invention, a user who had to walk on rocks to reach the water, would not be forced to take off the shoes on the shore and then wear a traditional swim fin when arrived near the sea.

[0026] In a preferred embodiment, said one or more predetermined positions comprise a closed position in which said one or more paddle portions fully or partially adhere to a surface portion located at the top of said shoe upper and preferably adhering to the vamp and/or tongue of said shoe. In this position, herein defined the closed position, the paddle is then partially or completely adhered to part of the upper and advantageously covers part of the central area thereof next to or at the shoe vamp. This minimizes the hindrance of out-of-water movements and also provides additional protection from

external agents to the instep area.

[0027] In other, not exclusive, and advantageous embodiments, the one or more paddle portions are made in one piece with said shoe sole and extend in the sagittal direction of a user in upright position who wears said shoe. The result is a general strengthening of the fin as a whole, an optimization of the processes involved in the production steps and an additional protection of the wearer's foot that can benefit from the stiffening of the sole itself from external agents and/or excessive twisting during in-water movement, usually resulting in muscle aches such as cramps in the foot.

[0028] Variations of the preceding embodiment provide for making the whole fin in one piece thereby having further advantages of production, assembling and duration of the finished product.

[0029] Further not exclusive embodiments provide that the fin is equipped with at least one or a combination of stiffening means provided with elastic and plastic properties to assist said paddle in keeping one or more known positions with respect to said shoe. Preferably, the means are provided with such a shape and made with such materials that can be deformed by simple gestures of the user without specific tools, for example only with the force of the hands; at the same time, the same stiffening means are characterized by sufficient elastic modulus and yield point to remain in a preset position when subject only to the forces involved in the movement of the user in or out of the water.

[0030] Variations of the preceding embodiment may include stiffening means shaped as a plate partially inserted into a cavity obtained in said shoe sole, these structures operating as ribs along at least part of the longitudinal axis of said fin and preferably made of metal and/or polymeric material such as, for example, polycarbonate.

[0031] Advantageously, the adherence of the paddle to the upper can be improved by fastening elements cooperating in fastening said paddle to said top surface of the upper when the paddle is in said closed position. This is particularly useful when the embodiment of the paddle includes elastically flexible ends that would have difficulty in remaining adherent to the upper especially if subjected to stresses resulting from the movement of the lower limb of the user.

[0032] In this sense, and even more advantageously, the invention can be carried out by comprising a plurality of hooking and unhooking mechanisms deployed on the perimeter of the paddle or part of it and cooperating with respective mechanisms on the shell surface of the upper. For example, slots deployed on the paddle surface, preferably near the perimeter edge, may be involved, cooperating with simple hooking systems even made in one piece on the upper such as protuberances or hooks acting as buttons that can be coupled to or uncoupled from the corresponding slot of the fin by short manual gestures of the user.

[0033] It was also found by the Applicant that the func-

tionality of the fin as a whole, both during in-water use (with the paddle open) and during out-of-water use (with the paddle closed) can be associated with particular paddle geometries that optimize the action of hydrodynamic thrust and at the same time are ergonomic and aesthetically pleasing. As a result, embodiments that can be combined with the previous ones are identified where the paddle or the multiple portions of the paddle itself are made longitudinally symmetrical and have a footprint comprising a concave conformation near the intersection between the longitudinal axis and the end of the paddle itself, this conformation being substantially shaped as the plane development of at least part of said shoe vamp. This particular embodiment, a variation of which is shown in the accompanying drawings, optimizes the functionality of the paddle in the open position and creates geometry such that the paddle itself in the closed position ergonomically and agreeably adheres to the shoe near the instep of the wearing foot.

[0034] These and other characteristics and advantages of the present invention will be more evident from the following description of some exemplary embodiments depicted in the attached drawings wherein:

fig. 1 shows a top view of an embodiment comprising shoe and paddle in the open position;

fig. 2 shows the same embodiment where the paddle is in the closed position to cover part of the upper in the area of vamp and tongue;

figs. 3 and 4 show side perspective view of the embodiment in the open and closed conditions of the paddle, respectively, already shown in figs. 1 and 2.

[0035] Therefore, the listed figures serve as support to the explanatory, and therefore not limiting, description of a preferred but not exclusive embodiment of a fin for swimming or for underwater activities and also usable out of the water, equipped with a reclining paddle that can take different positions and in particular a closed position (figures 2 and 4) and an open position (figures 1 and 3).

[0036] Referring to figure 1, the embodiment object of the illustrations can be observed according to a top view which could be the observation post of a user in upright position whose sagittal axis is substantially parallel to the axis X depicted in the figure and whose forehead is directed in the direction depicted by the arrow of said axis X.

[0037] The invention, comprising a paddle 1 made as an appendage of a shoe 2, has features that allow the paddle 1 to take multiple static positions with respect to the shoe, depending on the environment in which it works. While still having the elasticity features of the shapes and materials peculiar to swim fins, the invention allows a wearer to model part of the paddle by applying an appropriate deformation force so as to bring said paddle closer to or into contact with the top portion of the upper, in a configuration that is autonomously kept until a subsequent opposite action is applied by the user.

[0038] Thus, in the embodiment of figure 1 a fin according to the invention is shown, comprising a paddle 1 extending forward with respect to the shoe 2, a separation profile of the two portions being defined near the toe 25.

[0039] The shoe, which in this embodiment is of full-foot type to cover at least part of the front and rear areas of the foot, comprises a sole 3 and an upper 2, the upper meaning the top portion of the shoe without said sole.

[0040] The vamp 21 and the tongue 22 can be identified as front portions of the surface of the upper that cover the bottom and top portions of the foot; depending on the embodiment these parts can be made in one piece with the upper or can be only partially joined thereto, according to the choices of the field technician without affecting the peculiarities of the finding.

[0041] In this embodiment, the multi-purpose shoe comprises an optional plate-like structure 41 to reinforce a portion of the top surface of the paddle 1 and this structure extends towards the shoe in a cavity 42 shown in dashed line in figure 3. Said structure 41 has the function of stiffening the paddle and is made of a material provided with plasticity so that it is deformed when it is under the action of an external force applied so as to overcome the yield point near the toe 25.

[0042] The plate-like reinforcement structure 41 in the embodiment object of the drawings can be co-molded and/or at least partially made in one piece with the paddle, shoe and sole; Other embodiments, neither limiting nor exclusive, provide that paddle and shoe, possibly made in one piece, are produced with alternative elastic characteristics so that the optional reinforcement structure is not required.

[0043] In the purposes of the invention, the user applies said external force as he intentionally wants to flex the paddle 1, and bring the latter from the open position O shown in figures 1 and 3 to the closed position C shown in figure 2 and 4.

[0044] As it appears from the comparison between the figures 1,2 and the figures 3,4, when in closed position the paddle 1 adheres to the upper 2 and covers the much of the vamp 21 and the tongue 22. In this configuration, the fin is comparable to a shoe to be used on dry land and whenever a front paddle is unnecessary and hinders the movement.

[0045] Advantageously, additional protection against external agents, either solids and/or fluids, is brought by the paddle 1 in the closed position to the foot wearing the shoe. The benefit is even more significant in other embodiments of the shoe that, commonly, provide a front opening near the toe of the foot 25. In this context, the application of the closed paddle will prevent the phalanges or part of them from being directly exposed to foreign bodies, thereby reducing the risk of injuries or wounds outside the water.

[0046] In addition to the plate-like structure, the embodiment object of the drawings comprises three mechanisms to assist in keeping the ends of the paddle 1 at the shoe when the paddle is in the closed position. In

particular, on part of the free peripheral edge of the paddle 1 there are three hooking devices 101, 102, 103 such as slots or fastening clips or half press-stud intended, by being elastically forced, to hook or engage corresponding counterparts 201, 202, 203 permanently positioned or also made in one piece on the vamp 21 and/or tongue 22. When said mechanisms are mutually hooked or engaged to make the combinations 301, 302, 303 shown in figures 2 and 4, they allow the peripheral portion of the paddle 1 to be held fully adherent to the upper 2, thereby providing a benefit to the stability of the assembly as a whole and in particular for those ends which, without the mechanisms 301, 302, 303, would be unstable due to the elastic properties of the materials they are made of.

[0047] The paddle 1 of the fin-shoe object of the invention is also provided with concave peripheral shaping 110 in the remote end of the shoe. The concave shaping 110 allows the coupling of the paddle 1 to the upper 2 in the closed position C to be improved as this concave area is defined as plane development of part of the inlet profile 26 of the shoe. Advantageously, the above conformation prevents the end of the paddle from undesirably interfering with the top portion of the user's metatarsus. In addition, the same shape improves the hydrodynamic thrust of the paddle in the open position A and also achieves higher aesthetic levels for the observer.

[0048] Considering the above, it is clear that the implementation according to the invention achieves the predetermined purposes.

[0049] The object of the invention is susceptible of several modifications and variations, all falling within the inventive concept expressed in the attached claims. All the details can be replaced by technically equivalent elements, and the materials can be different according to the needs, without departing from the protection scope of the present invention.

[0050] Although the object has been described with particular reference to the attached figures, the reference numerals used in the description and claims are used to improve the intelligence of the invention and do not limit the claimed protection scope.

Claims

1. Multi-purpose footwear comprising a sole (3), a shoe tongue (22) and a shoe vamp (21) as a portion of shoe upper (2) and one or more paddle portions (1), **characterized in that** said one or more paddle portions are mounted so as to be displaceable to two or more alternative and predetermined positions with respect to said shoe.
2. Multi-purpose footwear according to claim 1 where said one or more predetermined positions comprise a closed position (C) in which said one or more paddle portions (1) fully or partially adhere to a surface portion located at the top of said shoe upper (2) and

- preferably adhering to the vamp (21) and/or tongue (22) of said shoe.
3. Multi-purpose footwear according to claims 1 or 2 wherein said one or more paddle portions (1) are made in one piece with said shoe sole (3) and extend in the sagittal direction of a user in upright position who wears said shoe. 5
 4. Multi-purpose footwear according to one or more of the preceding claims wherein said one or more paddle portions (1) and said shoe sole (3) are made in one piece with said shoe. 10
 5. Multi-purpose footwear according to one or more of the preceding claims comprising at least one or a combination of stiffening means provided with elastic and plastic properties to assist said paddle in keeping one or more known positions with respect to said shoe. 15
 6. Multi-purpose footwear according to claim 5 wherein said stiffening means comprise one or more structures at least partially made in one piece and/or comolded with said shoe and/or said paddle and/or said shoe sole, said structures operating as a rib along at least part of the longitudinal axis (X) of said fin. 20
 7. Multi-purpose footwear according to claim 5 wherein said stiffening means comprise one or more plate-like structures (4) partially inserted into a cavity obtained in said shoe sole, said structures operating as a rib along at least part of the longitudinal axis (X) of said fin. 25
 8. Multi-purpose footwear according to one or more of the preceding claims wherein said stiffening means are made of metal and/or polymeric material such as, for example, polycarbonate. 30
 9. Multi-purpose footwear according to one or more of the preceding claims comprising fastening elements cooperating in fastening said paddle to said top surface of the upper when said paddle is in said closed position. 35
 10. Multi-purpose footwear according to one or more of the preceding claims wherein said fastening elements comprise a plurality of holes or slots or the like (101, 102, 103) provided near the free peripheral edge, or a part of it, of the paddle and intended, by being elastically forced, to hook or engage respective protruding elements of the hook type or the like (201, 201, 203) on the shell surface of the upper. 40
 11. Multi-purpose footwear according to one or more of the preceding claims wherein said paddle is longitudinally symmetrical and has a footprint comprising an inward concave conformation (110) near the intersection between the longitudinal axis and the end of the paddle itself, this conformation being substantially shaped as the plane development of at least part of said shoe tongue (22). 45
 12. Multi-purpose footwear according to one or more of the preceding claims wherein the sole and/or the paddle are made with an average thickness between 2 and 10 mm and preferably of 4 mm. 50
 13. Multi-purpose footwear according to one or more of the preceding claims wherein said shoe has at least one opening in the front part of the upper and preferably near the tip (25). 55
 14. Multi-purpose footwear according to one or more of the preceding claims wherein said shoe has at least one opening in the rear part of the upper, near the end opposite that facing the paddle, and possibly equipped with retaining means to retain the paddle at the user's foot.

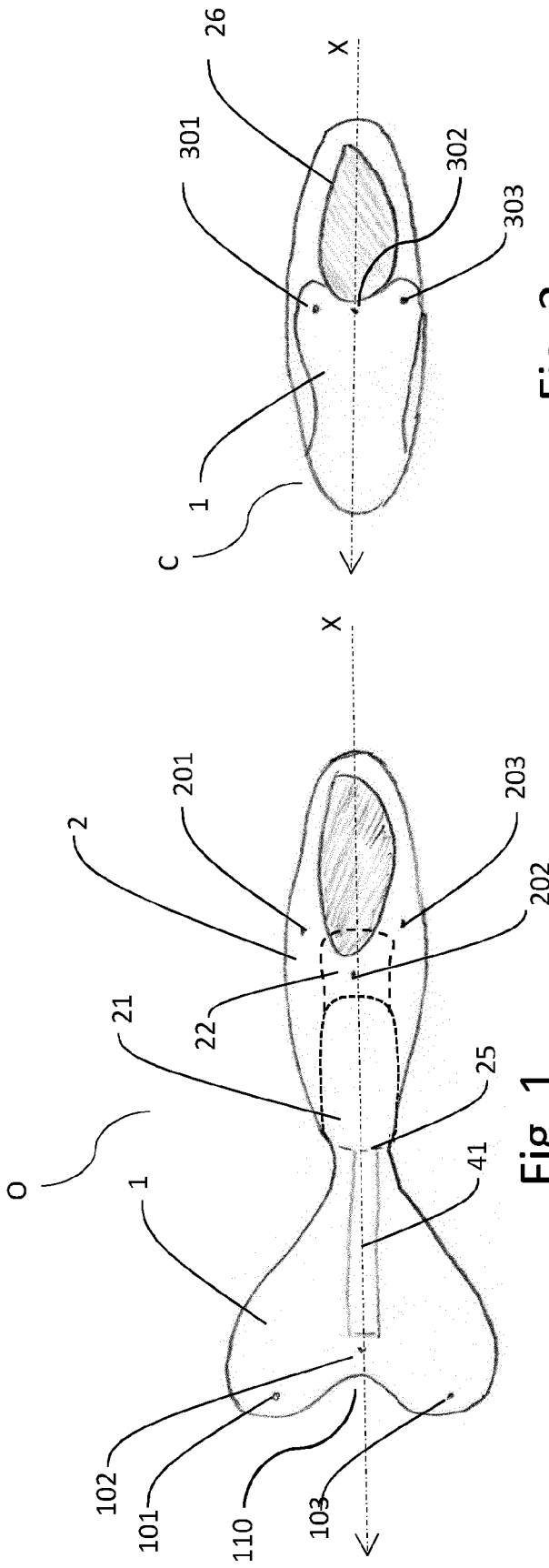


Fig. 1

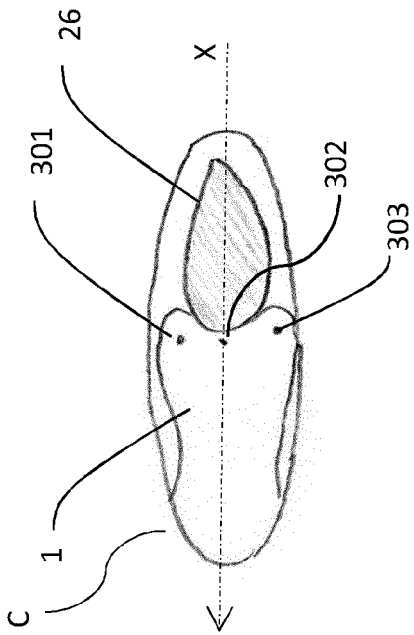


Fig. 2

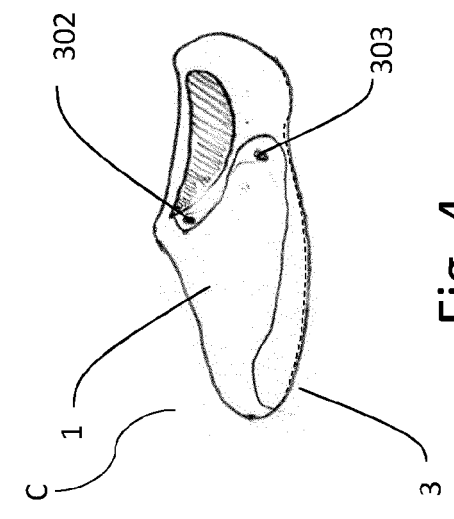


Fig. 3

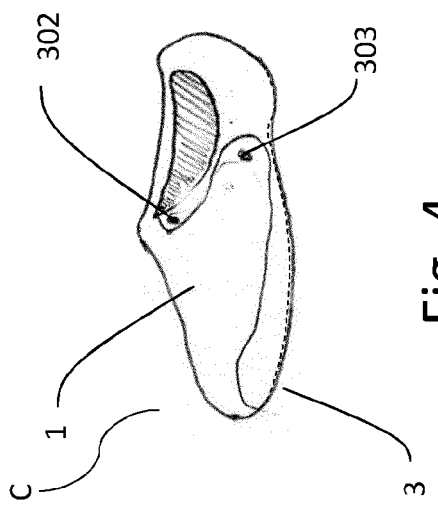


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 19 21 5210

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DOCUMENTS CONSIDERED TO BE RELEVANT				
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The present search report has been drawn up for all claims				
Place of search		Date of completion of the search		Examiner
The Hague		30 March 2020		Ciubotariu, Adrian
CATEGORY OF CITED DOCUMENTS				
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EPO FORM 1503 03/02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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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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REFERENCES CITED IN THE DESCRIPTION

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