The invention relates to a shoe comprising an element for variably adjusting shoe width, wherein the shoe comprises a shoe shaft (3) having at least one medial and/or at least one lateral opening (4) and a shoe sole (2), wherein the element comprises the following for each of the openings (4): at least one support cap (5), a flexible element (92) which can be adjusted with the support cap (5) and which is provided on the part of the support cap (5) which faces the foot and can be fixed to the edge of the opening (4) in the shoe shaft in order to close the opening (4), wherein the flexibility of the element (92) is greater than that of the shoe shaft (3), an anchoring element (8) which can be rigidly integrated into the shoe sole (3) and comprises at least one borehole channel (82) extending in the direction of the support cap (5), and at least one adjusting means (7); which connects the support cap (5) to the anchoring element (8) and is guided adjustably along the borehole channel (82), wherein the support cap (5) can be adjusted, by means of the adjusting element (7), in relation to the anchoring element (8) transversely to the shoe sole (2).
Fig. 1
SHOE COMPRISING AN ELEMENT FOR VARIBLY ADJUSTING SHOE WIDTH

[0001] The present invention relates to a shoe comprising an element for variably adjusting the shoe width.

STATE OF THE ART

[0002] As is well-known, shoes are manufactured in different sizes, the sizes being adapted to the foot length of the wearers rather than to their width. This is obviously a problem since the foot width does not always conform to the foot length. In other words, in practice there is a need to adapt the shoe width for a specific foot length which determines the shoe size according to the wearer.

[0003] To solve this problem, some shoe manufacturers have started to industrially manufacture shoes with different widths for each length or size of shoe. This method, however, is not necessarily practical since it greatly increases, on the one hand, the number of tools used in industrial shoe manufacturing and, on the other hand, the traders' stock due to the plurality of shoe sizes available on hand.

[0004] Also, from EP 0443 293 A1, shoes are known which can be adjusted both in width and in length with reference to the inner cup of the shoe. From DE 680 21 219 T2, adjustability in size, among others due to a curved plate in the sole structure is known. Furthermore, from DE 10 2007 031 225 A1, a shoe is known which is adjustable only in terms of the shoe sole, without any mention of involvement of the shoe shaft. Consequently, there is no sufficient adaptability of the entire shoe.

[0005] Therefore, it is an object of the invention to eliminate the disadvantages of the state of the art, providing a shoe with an element that allows variable adjustment of the shoe width so as to minimize the stock of shoe sizes and the effort in shoe manufacturing and, at the same time, increase the wearing comfort of a shoe.

[0006] The invention particularly aims at providing a shoe with an element for variable shoe width adjustment with which shoes can be manufactured industrially which provide a degree of comfort similar to that of a shoe manufactured by hand.

DISCLOSURE OF THE INVENTION

[0007] The above-mentioned objects as well as other objects to be found in the description are achieved by a shoe according to Claim 1. Other advantageous embodiments of the invention are indicated in the dependent claims.

[0008] According to the invention, a shoe having an element for variable shoe width adjustment is provided which allows the width adjustment of the exterior of a shoe so that the shoe can easily be adapted to the respective requirements and the comfort of the shoe wearer.

[0009] The shoe according to the invention has a shoe shaft with at least one medial and/or at least one lateral opening and a shoe sole. The element for variable shoe width adjustment comprises for each one of the openings at least one support cap and a flexible element adjustable with the support cap, which is provided on the part of the support cap which faces the foot and can be fixed to the edge of the opening in the shoe shaft so as to close the opening, wherein the element has a higher flexibility than the shoe shaft. Furthermore, it contains an anchoring element which can be rigidly integrated in the shoe sole and comprises at least one borehole channel extending in the direction of the support cap. It also comprises at least one adjusting means which connects the support cap to the anchoring element and is guided adaptably along the borehole channel, wherein the support cap can be adjusted, by means of the adjusting element, in relation to the anchoring element transversely to the shoe sole.

[0010] In advantageous embodiments, the support cap of the shoe is embodied as a spherical segment or as a frame.

[0011] Naturally, the adjustable support cap is to be employed preferably on the respective side and position of the foot, preferably in the anterior portion of the shoe at the widest part of the foot, medially (i.e. towards the inner part of the foot) or laterally (i.e. towards the outer part of the foot) or both as well as medially and laterally. The exact positioning of the support cap at the opening formed as an interruption of the shoe shaft will be explained below.

[0012] In a preferred embodiment, the flexible element is formed as a paddling element and connected with a sealing element at its side facing away from the shoe, so as to form a padding and sealing element.

[0013] It is furthermore advantageous that the sealing element consists of a rubber- or silicone-like coating attached to the support cap and that the paddling element consists of a neoprene material attached to the rubber- or silicone-like coating and being linked at the opening, wherein the rubber- or silicone-like coating is preferably formed as a soft rubber cap cover.

[0014] Preferably, the flexible element can have a thickness which corresponds approximately to the thickness of the shoe shaft.

[0015] In a preferred embodiment, the shoe is provided such that at the place of the opening, there is a recess in the lining of the shoe and instead of that the linked neoprene material of the flexible padding and sealing element is inserted.

[0016] An advantageous embodiment of the shoe is structured such that the rubber- or silicone-like coating is glued to the neoprene material and/or the support cap is glued to the rubber- or silicone-like coating or attached by means of a plug-in connector.

[0017] Other embodiments for integration of the element for variable width adjustment into the shoe are conceivable as well. For instance, an additional rubber wall can be glued or otherwise attached to the outside in order to protect the interior and the screw mechanism against dirt and dust.

[0018] Preferably it is envisaged that the adjustment means is formed as a screw part and that the borehole channel of the anchoring element is embodied as a threaded hole with a thread matching the screw part.

[0019] The screw part or the support cap, respectively, are preferably adjusted by means of a hexagon socket connector element with a matching hexagon socket screw key via the exterior of the shoe sole. However, an exterior-hexagon socket screw connection or other types of screw connections are conceivable as well.

[0020] According to a preferred embodiment, the adjusting means comprises two screw parts arranged on one side of the shoe sole at a single opening, wherein the anchoring element comprises two borehole channels and the support cap being divided into two parts corresponding to the two screw parts.

[0021] In particular, the support cap of the shoe can be provided with an incision.

[0022] It is an advantage if the element for variable shoe width adjustment is substantially arranged at a crease of the
shoe and/or wherein the element for variable shoe width adjustment is substantially arranged at the heel of the shoe.

In practice, the screw part has proven particularly suitable for rigid shoes, such as trekking shoes and the like. The screw part or the anchoring element, respectively, is preferably positioned both on the inner part and on the outer part of the foot, nearly precisely at the crease of the foot. Thus, the rolling movement of the foot could be slightly limited or the support cap slightly deformed during walking. This limitation or deformation, however, is unproblematic with rigid shoes (such as trekking shoes, for example) since normally stiff insoles are used in rigid shoes, basically preventing kinking. Thus, no or only a slight deformation is caused.

In another embodiment, the shoe is formed such that the anchoring element is embodied as a grid and/or with a rough surface suitable for adhesive bonding or injection molding in the shoe sole.

The lateral wings of the anchoring element can be formed as a grid structure or the like suitable for good and robust connection to the rubber mass of the shoe sole.

Preferably, the anchoring element can additionally have lamellae or the like which are embodied for providing better anchoring in the shoe sole in the transverse direction.

According to a preferred embodiment, the element additionally has a bushing which can be integrated in the shoe sole and is embodied for supporting the screw part or its second lateral part and/or the bottom part of the support cap, respectively, downwardly and laterally so as to provide more support to the support cap.

The support cap preferably consists of plastic or a composite material, preferably with an interior metal grid.

It is also advantageous that the support cap and/or the flexible padding and sealing element are individually adapted to the foot of the wearer and/or that the support cap is removably connected to the flexible padding and sealing element.

The element for variable shoe width adjustment according to the invention offers particular advantages in ease of use in conjunction with a high shaft. Moreover, the element for variable shoe width adjustment according to the invention allows the manufacturing of shoes with greater comfort to wearers with hallux or digitus.

The shoe according to the invention is also suitable for counteracting pathological supination tendencies of the feet during walking. To achieve this effect, traditionally orthopedists modify shoes by slightly thickening their soles either on the interior or on the exterior in height and possibly in width. For this purpose, suitable hard supporting materials, such as e.g. metal straps and the like, can also be integrated in the shoe soles which then additionally support the foot in the direction of the respective foot impairment. Such elements supporting a correct position of the foot, such as metal straps and hard or soft plastic elements, are either formed as integral parts of the shoe or as inlays.

SHORT DESCRIPTION OF THE DRAWINGS

FIG. 1 is a three-dimensional representation of a shoe having a high shaft and an integrated element for variable shoe width adjustment according to a first embodiment of the invention;

FIG. 2 is a three-dimensional representation of a shoe sole having an integrated element for variable shoe width adjustment according to the first embodiment of the invention;

FIG. 3 is a representation, three-dimensional and partially cut open, of a shoe sole with an anchoring element integrated therein for a support cap of the element for variable shoe width adjustment of the first embodiment;

FIG. 4 is a top view of a shoe sole with the anchoring element for the support cap of FIG. 3 integrated therein;

FIG. 5a is a lateral sectional view of the anchoring element in FIG. 3 and of a screw part screwed therein with the support cap not screwed in completely;

FIG. 5b is a lateral sectional view of the anchoring element in FIG. 3 and of a screwed part screwed into it with the support cap screwed in completely;

FIG. 6 is a three-dimensional representation of a shoe assembly or shoe shaft with an integrated element for shoe width adjustment according to the first embodiment in different stages of integration of the element and corresponding layer components;

FIG. 7a shows an alternative embodiment of the element for shoe width adjustment;

FIG. 7b shows an alternative embodiment of the element for shoe width adjustment;

FIG. 7c shows an alternative embodiment of the element for shoe width adjustment;

FIG. 8 shows alternative positioning possibilities for the element for shoe width adjustment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

FIG. 1 shows an embodiment of a shoe 1 substantially comprising a leather-like high shoe assembly or shoe shaft 3 with a front lateral opening 4 in the shaft, a support cap 5 which is visible through the lateral opening 4 and a shoe sole 2 with an anterior part 21 and a posterior part 22 of the shoe sole 2. The support cap 5 of the element for variable shoe width adjustment can be variably adjusted in terms of lateral extending or retracting position by means of a screw part or adjusting means 7, covered by a screw cap 6, and is thus adaptable to the requirements of a particular foot so as to maximize the wearing comfort of the shoe.

FIG. 2 shows the inner structure of the element for variable shoe width adjustment, substantially comprising a support cap 5 which laterally supports the foot and an anchoring element 8 integrated in the shoe sole 2, which maintains the support cap 5 in its respective lateral position by means of a screw part 7 which can be screwed in or out further.

FIG. 3 shows in a partial section of the shoe sole 2 the anchoring element 8 integrated therein, preferably injection-molded or glued in, which substantially comprises a central part with a borehole channel 82 and two lateral wings 83 with lamellae 84, which as a whole provide the anchoring element 8 with sufficient rigidity and anchoring surface within the shoe sole 2 so that the support cap 5 connected to it via the screw part 7 is secured in its position.

FIG. 4 indicates again the preferred position of the anchoring element 8 by means of dashed lines in the shoe sole 2 according to FIG. 3, this time from above. In addition, a recess 23 is shown here.

FIG. 5a shows the main components of the element for variable shoe width adjustment, except for a flexible padding and sealing element described in the following, and their mechanical assembly, in a first rather extended state.

The element for variable shoe width adjustment substantially comprises: the anchoring element 8 with the borehole channel 82 which is preferably formed as a threaded...
hole, the screw part 7 having a screw thread 74, a first 72 and a second lateral part 73, and the support cap. The lower part 51 of the support cap 5 is located in the recess 23 (according to FIG. 4), together with the screw part 7 mounted rotatably therein, which can move back and forth depending on the degree to which the screw part 7 is screwed into or out of the anchoring element 8. The support cap 5 is held between the first 72 and the second lateral part 73 and connected to the screw part 7 via the lower part 51 such that the screw part 7 can rotate in the lower part 51. By holding the support cap 5 with its lower part 51 between the first 72 and the second lateral part 73 of the screw part 7, wherein the support cap 5 simultaneously rotatably accommodates the screw part 7, the support cap 5 is translocator moveable back and forth by screwing in the screw part 7 to a greater or lesser extent.

Thus, with a fixed integration of the anchoring element 8 in the shoe sole 2, the position of a support cap 5 mounted in this manner can be suitably adapted to a foot by means of a rotation of the screw part 7; in other words, the foot is held more or less tightly in the shoe 1.

FIG. 5b also shows the main components of the element for variable shoe width adjustment shown in FIG. 5a, in a second, retracted state.

FIG. 6 shows the integration and embedding of the support cap 5 in the shoe 1. In an end-assembled state, the shoe 1 with the shoe assembly or shoe shaft 3, the shoe sole 2 and the lateral support cap 5 and a screw cap 6 are shown.

The support cap 5 is integrated in the following manner in the shoe 1 and in particular in the shoe assembly or shoe shaft 3 by at first linking a shoe lining 91 of the shaft in the interior of the shoe 4, at the lateral opening 4, to a neoprene material 92. Then, a rubber- or silicone-like coating is glued from the outside on the neoprene material 92 and on the seam for better distribution of forces, which coating is preferably formed as a soft rubber cap 93, the second side of the rubber cap 93 being glued to the support cap 5.

It is also conceivable to apply the support cap 5 with plug-in connectors, in which latter case the support cap 5 can be embodied individually and/or replaceably. The neoprene material 92 and the soft rubber cap 93 together form the flexible padding and sealing element mentioned above.

The support cap 5 is preferably made of plastic or of a composite material 1 with preferably an inner metal grid. The support cap 5 can substantially have the shape of a spherical segment, as shown in FIG. 6.

Alternatively, the support cap 5, as shown in FIG. 7a, can only be embodied as a frame, forming a cavity where e.g. the hallux can fit in. Advantageously, an additional, second support cap (not shown) can be provided with the embodiment in FIG. 7a, substantially similar in shape to the support cap in FIG. 6, which can be applied on the cavity defined by the rim of the support cap in FIG. 7c. Thus, this latter embodiment accounts for the respective ganglion (on the outer side of the foot) or hallux (on the inner side of the foot). Preferably, the second support cap is fastened removably so as to allow for a plurality of design possibilities for the volume of the cavity.

As a further alternative, the support cap 5 can be formed with an incision 5', as shown in FIG. 7c, so that a rolling movement (creasing of the shoe) is allowed to a certain extent and the cap is not detached even in case of adhesive bonding.

Also, other embodiments of the connection between the support cap 5 and the anchoring element 8, which are achieved by means of the screw part 7 in FIGS. 1 through 6, are conceivable. For instance, two screw connection parts can be used, as shown in FIG. 7b, wherein one first screw part 7 can be arranged before the crease in foot direction and a second screw part 7" can be arranged behind the crease in the foot direction. The embodiment with the FIG. 7b two screw parts can advantageously be used in shoes with flexible soles (e.g. shoes with a Strobel Stich), wherein the rigid support cap 5" is also divided into two parts corresponding to the two screw parts. An additional advantage of the embodiment in FIG. 7b is the precise adjustability.

The support caps can be positioned, as shown in FIGS. 1 through 7c, at the crease of the foot or around the crease, wherein the support cap or support caps with the corresponding anchoring elements can be arranged, according to the requirements, at the inner side or the outer side or both at the inner side and at the outer side of the foot.

Other alternative positions for the support caps are, as indicated in FIG. 8 by the reference signs 5a, 5b and 5c, at the two posterior parts of the feet, i.e. at the heels, wherein these positions are much less problematic since there the shoe hardly moves during walking. In certain types of shoes, e.g. football shoes, a width adjustment or better adjustment can be an advantage for achieving a better heel fit by means of the support caps 5a and 5b.

The present invention can be used with a plurality of shoes, including sports shoes, running shoes, hiking shoes, orthopedic shoes, diabetic’s shoes, boots and ski boots. Therefore, the term “shoe” used in this application comprises all types of shoes and boots which are mentioned above.

The reference signs used in the claims are for better comprehensibility, but do not limit the claims to the embodiments presented in the figures.

LIST OF REFERENCE SIGNS

1 shoe
2 shoe sole
21 anterior part of the shoe sole
22 posterior part of the shoe sole
23 recess (in the shoe sole)
3 shoe assembly or shoe shaft
4 lateral opening (for the element for variable shoe width adjustment)
5 support cap
5' two-part support cap
5" incision of the support cap
51 bottom part
6 screw cap
7 screw part or adjustment means
7' first screw part
7" second screw part
71 hexagon socket screw connection element
72 first lateral part
73 second lateral part
74 screw thread
8 anchoring element
81 central part (of the anchoring element)
82 borehole channel (in the anchoring element)
83 lateral wing (of the anchoring element)
84 lamellae
86 neoprene material
861 shoe lining
88 rubber cap
881 neoprene material
1. Shoe with an element for variable shoe width adjustment, wherein the shoe has a shoe shaft (3) having at least one medial and/or at least one lateral opening (4) and a shoe sole (2), wherein the element comprises the following for each of the openings (4):
   - at least one support cap (5),
   - a flexible element (92) which can be adjusted with the support cap (5) and which is provided on the part of the support cap (5) which faces the foot and can be fixed to the edge of the opening (4) in the shoe shaft in order to close the opening (4), wherein the element (92) has a higher flexibility than the shoe shaft (3),
   - an anchoring element (8) which can be firmly integrated in the shoe sole (3) at least one borehole channel (82) extending in the direction of the support cap (5), and at least one adjusting means (7) which connects the support cap (5) to the anchoring element (8) and is guided adjustably along the borehole channel (82), wherein the support cap (5) can be adjusted, by means of the adjusting element (7), in relation to the anchoring element (8) transversely to the shoe sole (2).

2. Shoe according to claim 1, wherein the support cap (5) is embodied as a spherical segment.

3. Shoe according to claim 1, wherein the support cap (5) is embodied as a frame.

4. Shoe according to claim 1, wherein the flexible element is embodied as a padding element (92) and connected to a sealing element (93) at its side facing away from the shoe, so as to form a padding and sealing element (92, 93).

5. Shoe according to claim 4, where the sealing element (93) consists of a rubber- or silicone-like coating (93) connected to the support cap (5), and where the padding element (92) consists of neoprene material (92) which is connected to the rubber- or silicone-like coating (93) and which is linked at the opening, the rubber- or silicone-like coating (93) being preferably embodied as a soft rubber cap (93).

6. Shoe according to claim 4, wherein the flexible element (92) has a thickness corresponding approximately to the thickness of the shoe shaft (3).

7. Shoe according to claim 5, wherein in the position of the opening (4), a lining (91) of the shoe is recessed and therefore the linked neoprene material (92) of the flexible padding and sealing element (92, 93) is inserted.

8. Shoe according to claim 5, wherein the rubber- or silicone-like coating (93) is glued to the neoprene material (92) and/or wherein the support cap (5) is glued to the rubber- or silicone-like coating (93) or attached by means of a plug-in connector.

9. Shoe according to claim 1, wherein the adjusting element is embodied as a screw part (7) and the borehole channel (82) of the anchoring element (8) is embodied as a threaded hole with a thread matching the screw part (7).

10. Shoe according to claim 8, wherein the adjusting element comprises two screw parts (7, 7') arranged on one side of the shoe sole (2) at one single opening (4), the anchoring element (8) comprising two borehole channels (82) and the support cap (5) being divided into two parts corresponding to the two screw parts (7, 7').

11. Shoe according to claim 1, wherein the support cap (5) is provided with an incision (5)*.

12. Shoe according to claim 1, wherein the element for variable shoe width adjustment is substantially arranged at a crease of the shoe and/or where the element for variable shoe width adjustment is substantially arranged at the heel of the shoe.

13. Shoe according to claim 1, wherein the anchoring element (8) is embodied as a grid and/or with a rough surface suitable for gluing or injection molding in the shoe sole (2).

14. Shoe according to claim 1, wherein the anchoring element (8) additionally has lamellae (84) or the like, embodied for providing better anchoring in the shoe sole (2) in the transverse direction.

15. Shoe according to claim 1, wherein the element for variable shoe width adjustment additionally has a bushing which can be integrated in the shoe sole (2) and is adapted to support the screw part (7) or a second lateral part (73) of the screw (7), respectively, and/or a lower part (51) of the support cap (5) downwardly and laterally and to provide better stability to the support cap (5) in this manner.

16. Shoe according to claim 1, wherein the support cap (5) consists of plastic or a composite material with preferably an inner metal grid.

17. Shoe according to claim 4, wherein the support cap (5) and/or the flexible padding and sealing element (92, 93) are individually adapted to the foot of the shoe's wearer and/or wherein the support cap (5) is removably attached to the flexible padding and sealing element (92, 93).

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