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(54) **DANCING SHOE, SOLE/TOE UNIT, UPPER SHOE, AND KIT CONSISTING OF A SOLE OR A SOLE/TOE UNIT AND AN UPPER SHOE**

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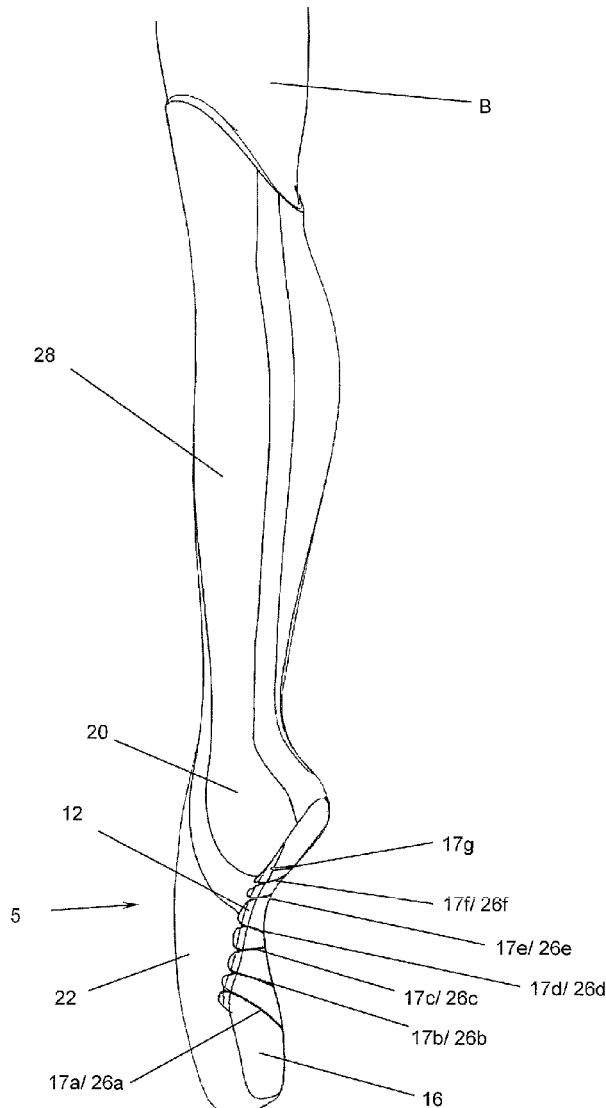
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(57) **ABSTRACT**

A dancing shoe is described. The latter has a sole with an inner side and an outer side, which sole extends in a longitudinal direction from a rear end to a front end. The outer side of the sole has a plurality of incisions. Moreover, an upper shoe is provided, which is connected to the sole and has a foot section. To connect the upper shoe to the sole, the foot section of the upper shoe has, on its underside, at least one recess through which elongate connection elements extend which, in the state when the dancing shoe is being worn, are received at least in some regions in incisions of the outer side of the sole.

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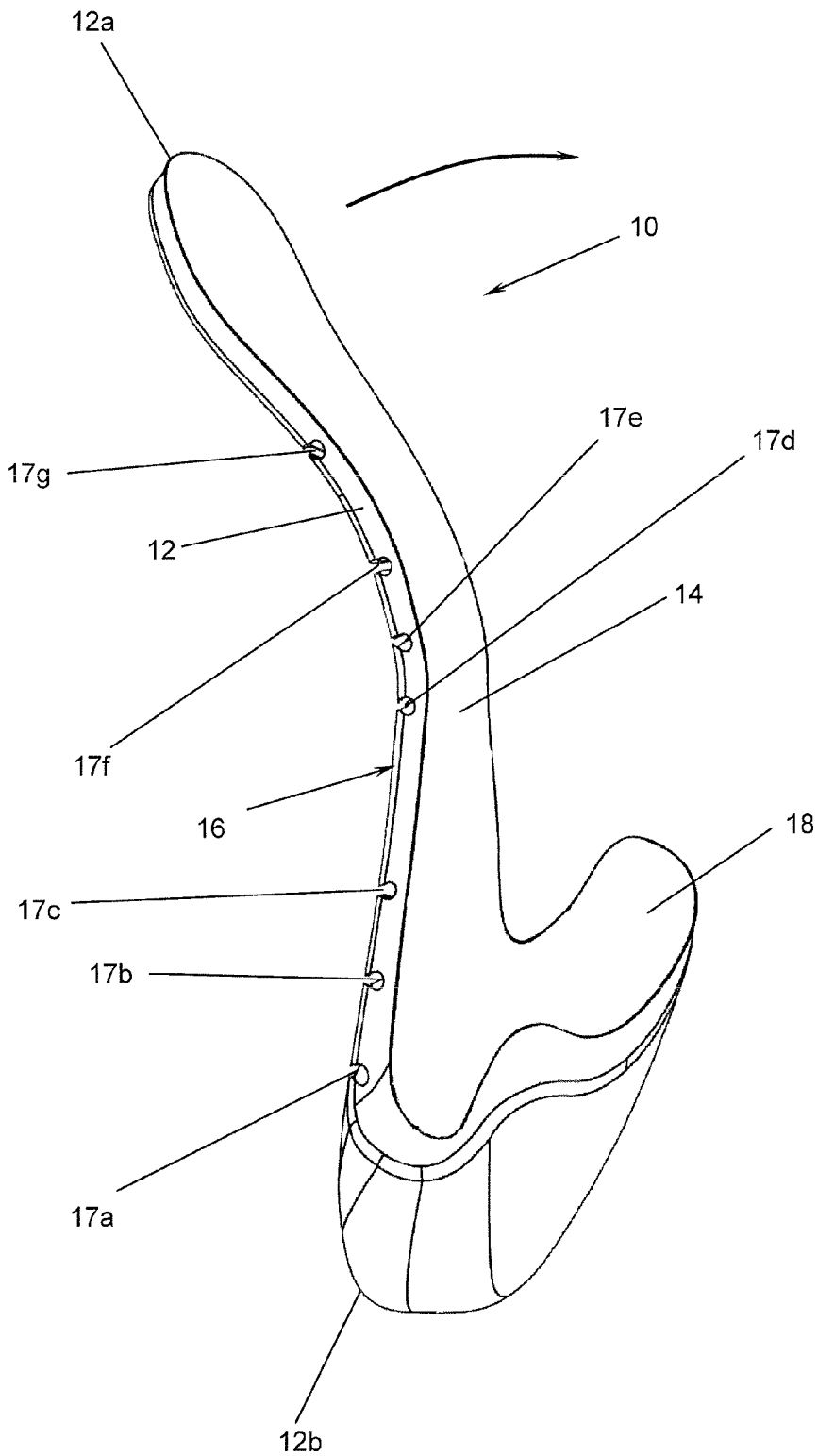


FIG. 1

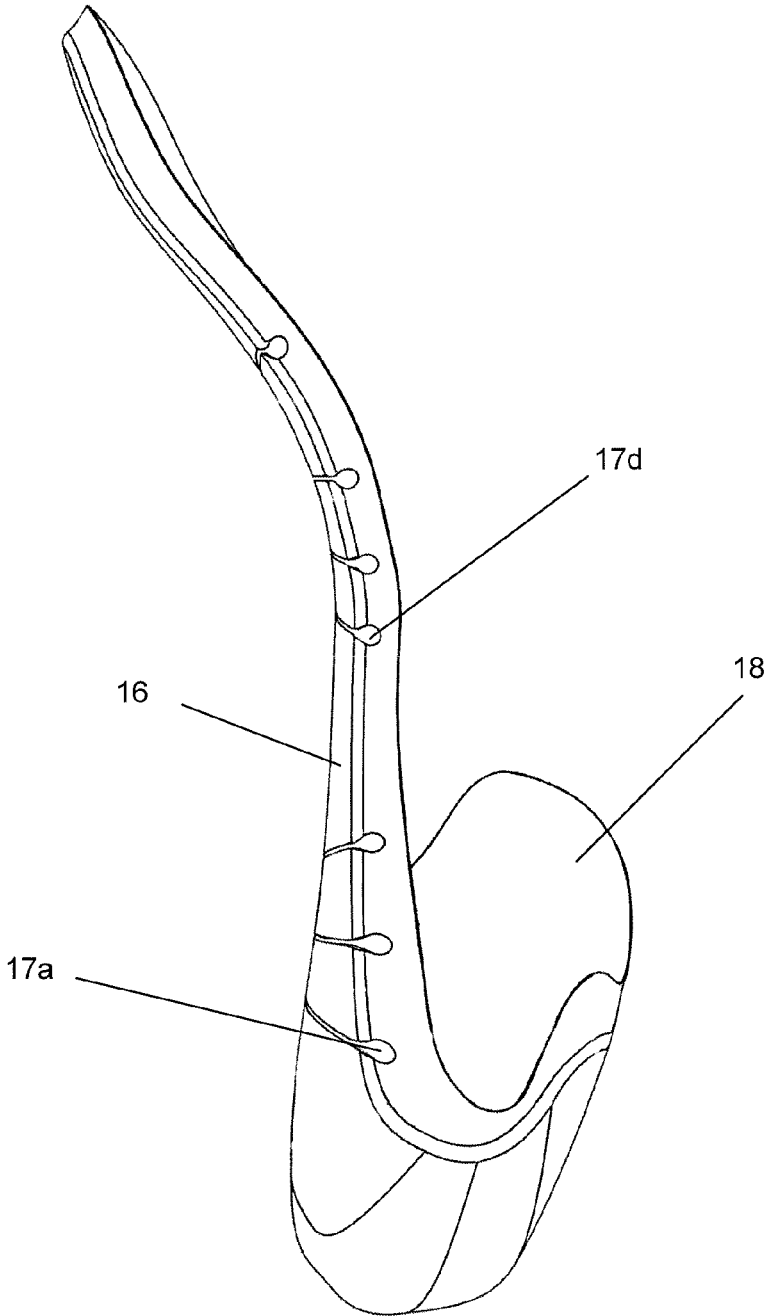


FIG. 2

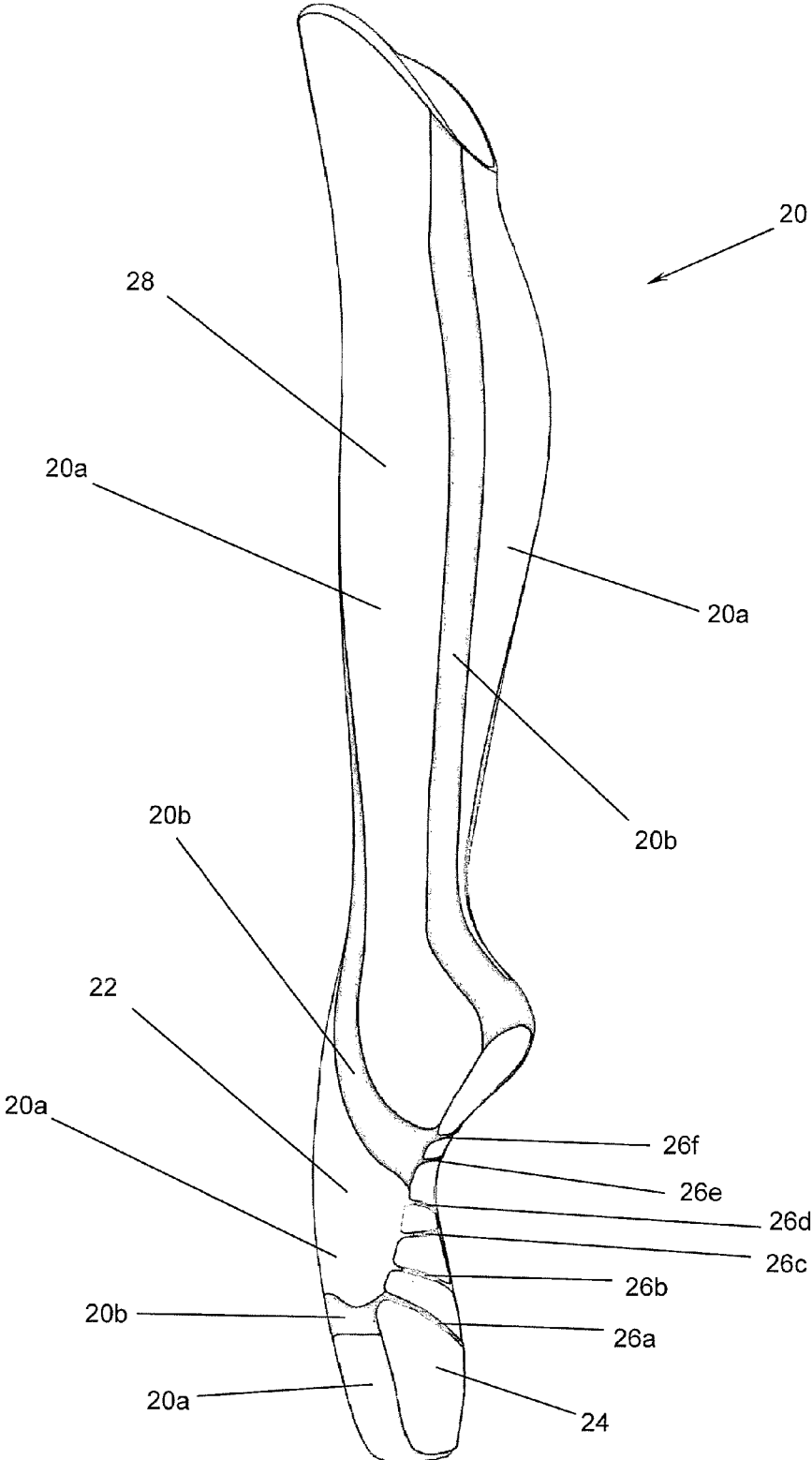


FIG. 3

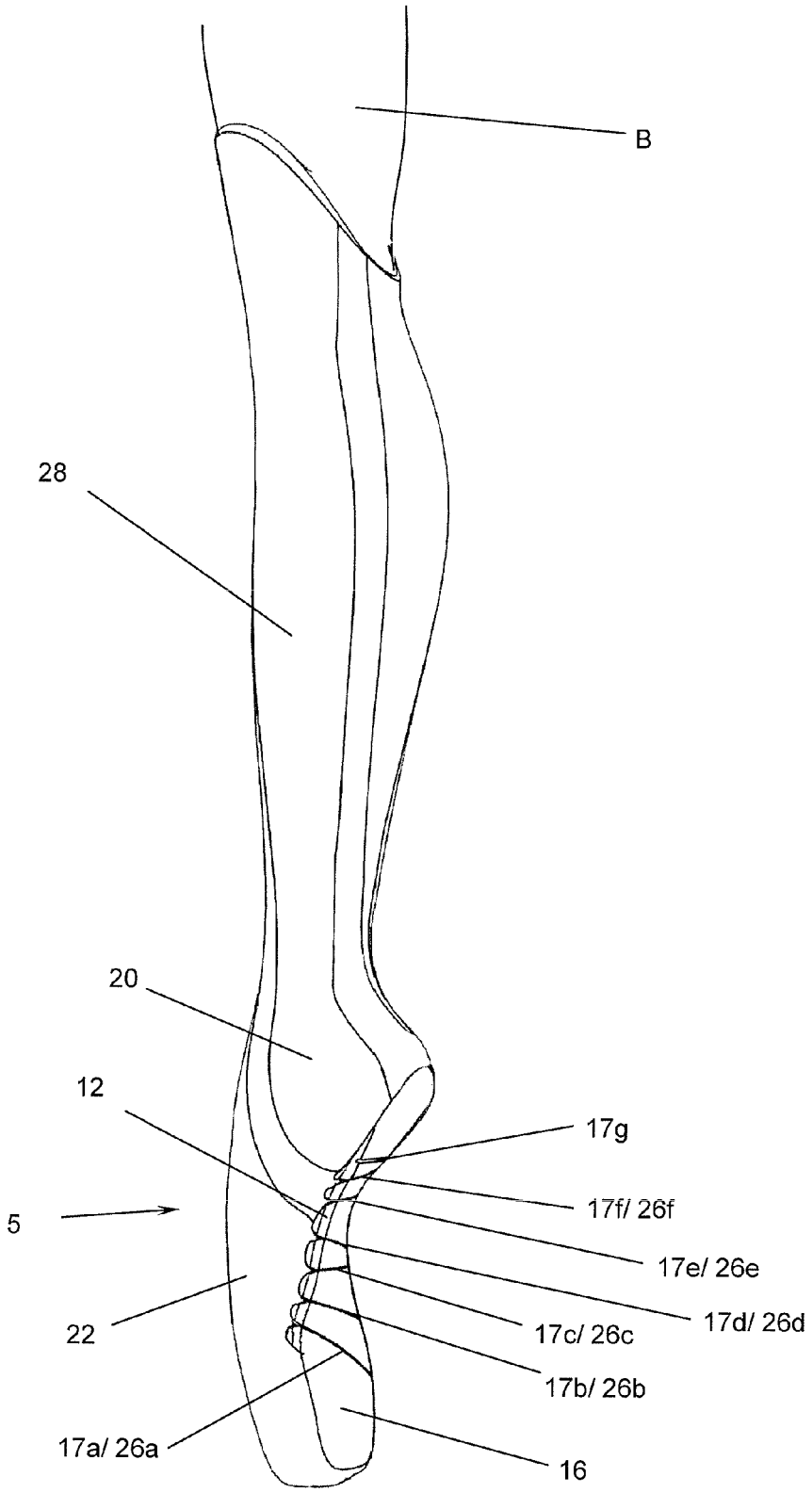


FIG. 4

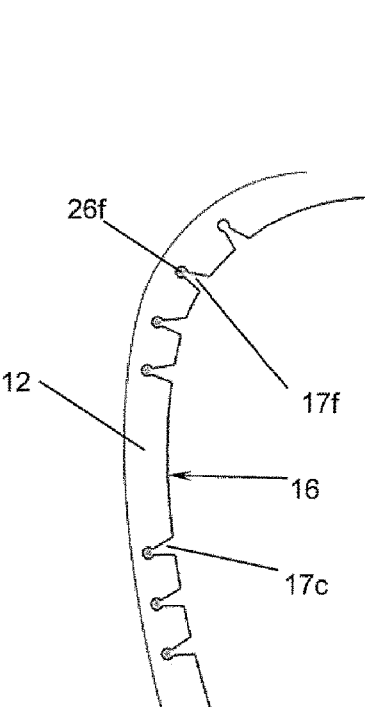


FIG. 5

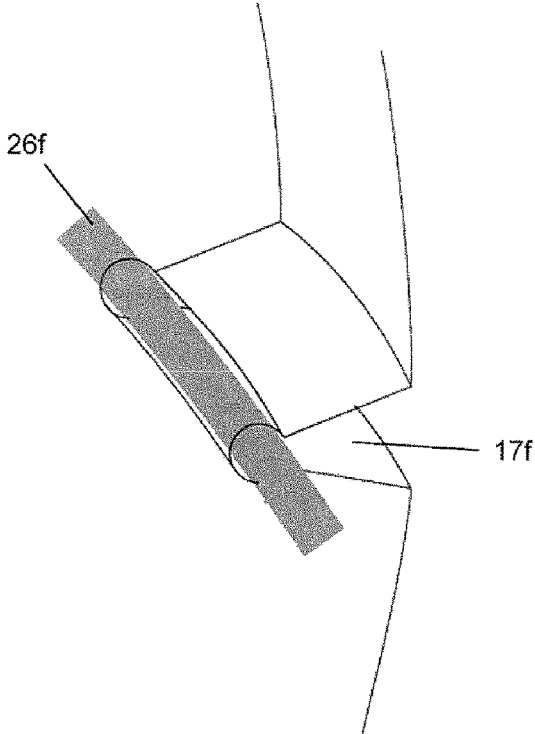


FIG. 6

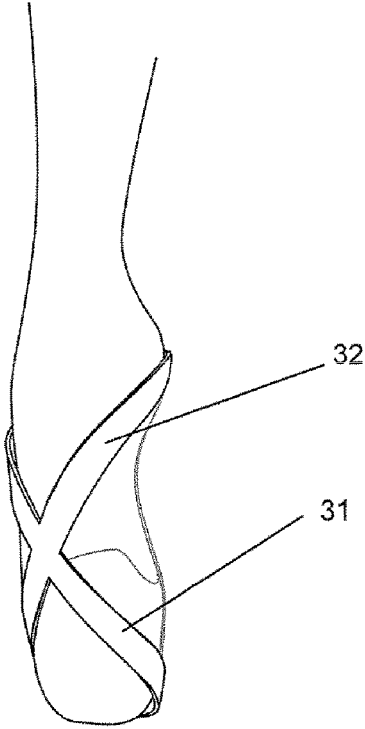


FIG. 7

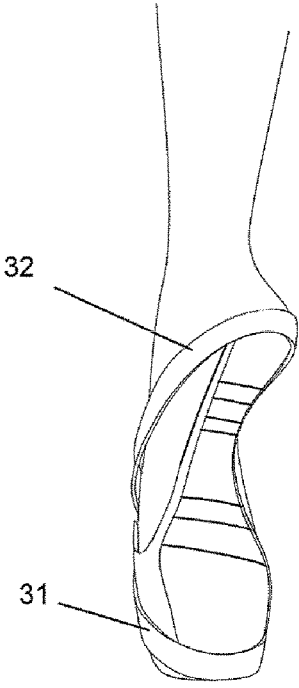


FIG. 8

DANCING SHOE, SOLE/TOE UNIT, UPPER SHOE, AND KIT CONSISTING OF A SOLE OR A SOLE/TOE UNIT AND AN UPPER SHOE

DESCRIPTION

[0001] The invention relates to a dance shoe as defined in the preamble to claim **1**, a sole/toe unit according to claim **25**, an upper shoe according to claim **26** and a kit composed of a sole or a sole/toe unit and an upper shoe according to claim **27**.

[0002] Dance shoes, in particular pointe dance shoes for the classical ballet dance, have been known for some time. The invention relates in particular to those types of dance shoes, but can also be used for other types of dance shoes. In the following, we initially only refer to pointe dance shoes.

[0003] From a functional point of view, these types of dance shoes—frequently also called ballet shoes—consist of a sole extending from a back end to a front end, a toe box connected thereto in the region of the front end, as well as a textile upper shoe that is connected to the sole and toe box and also includes straps or laces for tying. To this day, dance shoes of this type are primarily manufactured individually with mechanical methods and are correspondingly expensive. This is of particular importance since professional male/female dancers wear out one to two pairs of ballet shoes per year.

[0004] Another problem with ballet shoes is that they must frequently be reworked by the male/female user, so that they can be worn at all.

[0005] Finally, a general problem with ballet dancing and especially the classical ballet dancing is the extremely high stress on the feet, which frequently leads to permanent damage to the feet.

[0006] From the generic U.S. Pat. No. 8,082,682 B2, for example, it is known that to make the sole of a shoe more flexible, the outside of the sole is provided with incisions taking the form of grooves that extend transverse to the longitudinal extension of the sole.

[0007] Starting therefrom, it is the object of the present invention to make available a dance shoe which at least contributes to an improvement regarding the above-described problem.

[0008] This object is solved with a dance shoe having the features as disclosed in claim **1**. A sole/toe unit for use with such a dance shoe is disclosed in claim **25**, an upper shoe for use with such a dance shoe is disclosed in claim **26**, and a kit consisting of a sole or a sole/toe unit along with an upper shoe is disclosed in claim **27**.

[0009] The basic idea behind the invention is to produce the sole and the upper shoe separately, such that they are connected only in the state when they are worn. For this, the upper shoe has a foot section with an underside that contains at least one recess. Elongated connecting elements extend through this recess which, when the shoe is worn, are accommodated at least in some sections in incisions on the outside of the sole. At least two and in particular at least four such connecting elements are preferably provided. As a result, a sufficiently strong, but detachable, connection is created between sole and upper shoe when the shoe is worn. The upper shoe in this case preferably consists at least in some parts of an elastic material. This type of design results in numerous advantages.

[0010] On the one hand, the process of producing the dance shoe is simplified in that the step of connecting the sole and to the upper shoe is omitted.

[0011] If a sole is worn out, the upper shoe can furthermore be used with a new sole.

[0012] The upper shoe preferably is embodied in the form of a stocking and has a leg section in addition to the foot section. Such a stocking-type design of the upper shoe can be adapted to the requirements of the male/female dancer, particularly since it has regions of differing elasticity and/or stiffness. On the whole, this also results in a better hold for the foot, thus reducing the stress for the male/female dancer. For these reasons, a ballet shoe according to the invention, for which the upper shoe is designed as a stocking, is definitely preferable for use during the training. For dancing performances, it may be preferable in some cases to use an upper shoe without the leg segment.

[0013] As mentioned, one preferred exemplary use of the invention is for a pointe dance shoe, which furthermore has a dimensionally stable toe box. The latter is preferably formed in that a toe unit adjoins the sole, wherein it is preferable if the toe unit is integrally connected to the sole, so as to form a sole/toe unit. A toe protection insert is advantageously arranged inside the toe unit. This insert can be manufactured separately, in particular so as to be adapted to the front foot of the male/female dancer.

[0014] Preferred embodiments and further advantages follow from the dependent claims as well as the exemplary embodiment, shown in further detail with reference to the Figures.

[0015] The invention is described in more detail in the following with the aid of a preferred example and reference to the Figures, showing in:

[0016] FIG. 1 A sole/toe unit for a dance shoe;

[0017] FIG. 2 The sole/toe unit from FIG. 1, as seen from a different viewing angle;

[0018] FIG. 3 An upper shoe to be attached to the sole/toe unit shown in FIGS. 1 and 2;

[0019] FIG. 4 A complete dance shoe being worn, consisting of the sole/toe unit according to FIGS. 1 and 2, the upper shoe according to FIG. 3 and, if applicable, a non-depicted toe-protection insert;

[0020] FIG. 5 A schematic section through the sole of the dance shoe in FIG. 4;

[0021] FIG. 6 A detail of the drawing in FIG. 5, shown in a schematic, perspective representation;

[0022] FIG. 7 A sole/toe unit and two crossed-over tie straps arranged thereon; and

[0023] FIG. 8 The representation shown in FIG. 7, but seen from a different viewing angle.

[0024] The invention is described in further detail below with the aid of an exemplary embodiment of an inventive ballet shoe for the pointe dance. This shoe comprises a sole **12**, a toe unit **18** and an upper shoe **20**. The sole **12** and the toe unit **18** are produced integrally and form the sole/toe unit **10**. As a rule, the toe unit contains a toe-protection insert (not shown). We want to mention at this point that for other embodiments of the invention, which do not require a dimensionally stable toe box, an inventive shoe can also consist only of sole and upper shoe, or of upper shoe and sole/toe unit with a small, formed-on toe unit. Furthermore, the sole could also be pulled up somewhat on the sides, so that it surrounds the sole on the foot of the male/female dancer to some degree.

[0025] The embodiment of the inventive dance shoe as described thus consists of at least two individual elements, namely a sole/toe unit 10 and an upper shoe 20. As mentioned, a toe-protection insert can also be provided inside the toe unit of the sole/toe unit, if applicable. The sole/toe unit 10 is initially described further with reference to FIGS. 1 and 2.

[0026] This sole/toe unit 10 has two functional segments, namely the sole 12 and the toe unit 18. The toe unit 18 for the described, preferred embodiment is formed integrally onto the sole 12, so that the two elements have a material to material connection. The sole/toe unit 10 can be composed totally or partially of a synthetic material and can be produced, for example, with the injection-molding technique or also with a 3D printing method. Insofar as the sole/toe unit is composed in part of a synthetic material, it frequently may be preferable to work reinforcements in the form of fibers (e.g. carbon or glass fibers, but also natural material fibers) integrally into the sole/toe unit. Insofar as the fibers are to be oriented, it may be useful to provide fibers extending lengthwise and/or transverse to the longitudinal extension of the sole/toe unit, depending on the required profile. The sole/toe unit 10 can be produced in standard sizes or can be tailored individually to a male/female dancer. Suitable synthetic materials for the sole/toe unit are, for example, thermoplastic-processed polyurethanes (TPU), thermoplastic elastomers (TPE) and polyamides (PA).

[0027] The sole 12 extends in longitudinal direction from a back end 12a to a front end 12b and has an inside 14 (meaning the side pointing to the foot sole when the shoe is worn) and an outside 16. The outside 16 contains a plurality of incisions 17a-17g which are embodied for the example as grooves 17a-17g that extend over the total width of the sole 12. These grooves 17a-17g expand on their inside ends, so that they are essentially key-shaped (see also FIGS. 5 and 6). In most cases, the incisions are advantageously formed in this way, but other patterns, arrangements, or cross-sectional shapes are also conceivable. Of course, the number of incisions are not restricted to 7 and more or fewer such incisions can also be provided. Depending on the production method used, the number, position and orientation of the incisions embodied herein as grooves can also be adapted to the foot of the individual male/female dancer. The grooves 17a to 17g have two functions: on the one hand they give the sole 12 a defined flexibility and this defined flexibility is unidirectional. In FIG. 1, the sole can be bent relatively strongly in arrow direction since the grooves are expanding while the sole “resists” in the opposite direction as soon as the grooves are “closed.” On the other hand, the grooves function to attach the upper shoe, as will be shown later on. It must be considered here that not all grooves must also be used to attach the upper shoe. In the depicted example, the groove 17g is not used for attaching the upper shoe.

[0028] A toe-protection insert of a softer material, e.g. silicon, can additionally be arranged in the toe unit (not shown herein). This insert can be adapted individually to the front foot section of the male/female dancer.

[0029] The upper shoe 20, intended to be attached to the above-described sole/toe unit, is now described further with the aid of FIG. 3.

[0030] FIG. 3 shows an upper shoe 20 to be attached to the sole/toe unit 10. The upper shoe 20 of the depicted embodiment is essentially shaped like a stocking and consequently

has a foot section 22 and a leg section 28. The foot section 22 is provided with a recess 24 in the sole region which, for the exemplary embodiment shown, extends substantially over the total region of the sole and contains web-type connecting elements 26a to 26f that extend essentially transverse to the longitudinal direction. The term “transverse” here need not necessarily mean “perpendicular,” as can also be seen in FIG. 3. However, an orientation that is substantially perpendicular to the longitudinal direction is frequently preferred. These connecting elements 26a to 26f are arranged and dimensioned such (as will be shown later on) that they extend through grooves 17a to 17f in the sole 12 once the dance shoe is assembled.

[0031] The upper shoe 20 is a textile element which, for example, can be knitted, crochet or woven either totally or in part. The stocking-type upper shoe preferably is composed at least in some sections of an elastic material, for example of a mixture of cotton fibers and elastane or spandex. Other suitable materials are, for example, polyamide and polyester.

[0032] FIG. 3 furthermore shows that the upper shoe 20 contains first regions 20a and reinforced regions 20b. The reinforced regions 20b here have a lower elasticity than the first regions 20a. The reinforced regions 20b can be produced separately and can then be combined with a basic body of the upper shoe 20, which initially consists only of a first region 20a. However, as a rule it is preferable to produce the first regions 20a and the reinforced regions 20b directly as one piece, meaning integrally, using corresponding knitting or weaving techniques. Reinforcing material can additionally also be applied. Corresponding techniques are known, for example, from the sector for athletic clothing. The reinforced regions 20b in particular function to offer more support for especially stressed regions and/or to purposely support or stimulate specific muscle groups. The reinforced regions can also be embodied in the form of a tape which stimulates the muscular system. It can be useful to coat the reinforced regions 20b on the inside with silicon, so that they adhere to the skin.

[0033] As shown, it is advantageous if at least one reinforced region 20b extends over the front foot and if, starting from the edge of the recess 24, at least one reinforced region 20b extends to the upper end of the leg section 28 (insofar as it exists, as shown in the exemplary embodiment). It is especially advantageous if the leg section 28 is embodied long enough to extend around the calf of the male/female dancer when the shoe is worn.

[0034] FIG. 4 shows a dance shoe 5, worn by a male/female dancer, which consists of the sole/toe unit 10 and the upper shoe 20. Putting on this dance shoe 5 takes place as follows:

[0035] The sole/toe unit 10 is first fitted onto the foot in such a way that the toes of the male/female dancer are located in the toe unit 18 and the inside 14 of the sole fits against the bottom of the foot. Following this, the upper shoe 20 is pulled in the manner of a stocking over the foot and the sole/toe unit, wherein the “final state” generally is reached when the leg section 28 has been pulled over the calf. Insofar as the connecting elements 26a to 26f do not slip automatically into the grooves 17a to 17g, they must be inserted by hand if applicable (see also FIGS. 5 and 6). The above-described cross-sectional shape of the grooves improves the hold of the connecting elements in the grooves. In this state, the dance shoe 5 can then be used immediately. A further

tying of ties or the like, as is necessary for traditional ballet shoes, is not required for the example described so far, but additional ties or straps can be provided to further stabilize the foot. For example, as shown in FIGS. 7 and 8, a type of “cross strap” with two straps for pulling tight can also be provided.

[0036] This cross strap comprises two tie straps 31, 32, wherein the first tie strap extends from the left front foot side to the right heel side and the second tie strap 32 extends from the right front foot side to the left heel side. Thus, each tie strap 31, 32 extends from a front end to a back end. The two tie straps thus extend across the instep, so as to cross thereon. The tie straps 31, 32 can be segments of a one-piece element (as shown), or they can be produced as individual tie straps. In the form of a one-piece embodiment, the one-piece layout preferably forms a closed figure “8” (see FIG. 8), meaning the front and the back ends of the tie straps merge. The tie straps 31, 32 advantageously are connected to the sole/toe unit 10, namely to the front end and the back end of the sole/toe unit 10. Since the two tie straps should be under tension when in use, they are preferably made of a non-elastic material. It is furthermore preferred if at least one of the two connections is not permanent, so that the tension can be adjusted. A Velcro closure, for example, is suitable for this. Once the upper shoe is fitted on, the two tie straps 31, 32 are located at least in some sections but as a rule completely between the sole/toe unit 10 and the upper shoe. In the state where the shoe is worn and correctly adjusted, the cross strap generates compression when the instep of the foot pushes against the cross strap during the pointe position. As a result, the bending of the sole is limited further, thereby providing additional support for the male/female dancer.

[0037] Separate tie straps that are integrated into the upper shoe can additionally or alternatively also be provided, or the cross strap could be integrated into the upper shoe (not shown).

[0038] In particular, the sole/toe unit and a possibly provided toe-protection insert can be produced so as to be individually adapted to the male/female dancer. For this, the feet can be scanned with a 3D scanner and the above-mentioned parts can be produced according to the resulting data set.

LIST OF REFERENCE NUMBERS AND SIGNS

[0039]	5 dance shoe
[0040]	10 sole/toe unit
[0041]	12 sole
[0042]	12a back end
[0043]	12b front end
[0044]	14 inside
[0045]	16 outside
[0046]	17a-g groove
[0047]	18 toe unit
[0048]	20 upper shoe
[0049]	20a first region
[0050]	20b reinforced region
[0051]	22 foot section
[0052]	24 recess
[0053]	26a-f connecting element
[0054]	28 leg section
[0055]	31 first tie strap
[0056]	32 second tie strap
[0057]	B leg

1. A dance shoe (5) with a sole (12) having an inside (14) and an outside (16) and extending in longitudinal direction from a back end (12a) to a front end (12b), as well as an upper shoe (20) with a foot section (22), wherein the outside (16) of the sole (12) comprises a plurality of incisions (17a-g),

characterized in that the foot section (22) is provided on its underside with at least one recess (24) through which elongated connecting elements (26a-f) extend which, when the dance shoe (5) is worn, are accommodated at least sectionally in the incisions (17a-g) on the outside (16) of the sole (12).

2. The dance shoe (5) according to claim 1, characterized in that the upper shoe (20) takes the form of a stocking and, in addition to the foot section, comprises a leg section (28) extending from the foot section (22), wherein the underside of the foot section (22) is located opposite the leg section (28).

3. The dance shoe (5) according to claim 2, characterized in that the leg section (28) of the upper shoe (20) has a length of at least 15 cm.

4. The dance shoe (5) according to claim 3, characterized in that the leg section (28) of the dance shoe being worn extends along the complete calf of the male/female dancer.

5. The dance shoe (5) according to claim 1, characterized in that each connecting element (26a-f) is accommodated in precisely one incision (17a-f).

6. The dance shoe (5) according to claim 1, characterized in that the incisions (17a-g) are embodied as grooves (17a-g) extending transverse to the longitudinal direction which preferably comprise an inner end with an enlarged cross section.

7. The dance shoe (5) according to claim 6, characterized in that the grooves (17a-g) respectively extend over the complete width of the sole (12).

8. The dance shoe (5) according to claim 1, characterized in that the upper shoe (20) is composed of a textile material and, in particular, is knitted or woven.

9. The dance shoe (5) according to claim 1, characterized in that the upper shoe (20) comprises at least a first region (20a) and at least one region (20b) that is reinforced as compared to the first region (20a).

10. The dance shoe (5) according to claim 9, characterized in that at least one reinforced region (20b) spans the front foot of the male/female dancer when the shoe is worn.

11. The dance shoe (5) according to claim 2, characterized in that at least one reinforced region (20b) extends along the calf of the male/female wearer when it is worn.

12. The dance shoe (5) according to claim 1, characterized in that the upper shoe (20) is elastic, at least in some sections.

13. The dance shoe (5) according to claim 1, characterized in that the sole (12) is composed of a fiber-reinforced synthetic material.

14. The dance shoe (5) according to claim 13, characterized in that at least some of the fibers of the fiber-reinforced synthetic material are oriented in a specified direction.

15. The dance shoe (5) according to claim 14, characterized in that at least some of the fibers are oriented in longitudinal direction of the sole (12).

16. The dance shoe (5) according to claim 13, characterized in that at least some of the fibers are oriented in transverse direction of the sole (12).

17. The dance shoe (5) according to claim 1, characterized in that it comprises a first tie strap (31) extending from the front left end region to the right back end region of the dance shoe as well as a second tie strap (32) extending from the right front end region to the left back end region of the dance shoe and that the two tie straps cross each other over the instep of the foot when the shoe is worn.

18. The dance shoe (5) according to claim 17, characterized in that the ends of the tie straps (31, 32) are connected or can be connected to the sole.

19. The dance shoe (5) according to claim 17, characterized in that the tie straps (31, 32) form components of an integral tension element which is preferably embodied in the form of a number eight.

20. The dance shoe (5) according to claim 17, characterized in that the tie straps (31, 32) are arranged at least in some sections between the sole (12) and the upper shoe (20).

21. The dance shoe (5) according to claim 1, characterized in that it furthermore comprises a toe unit (18) that is connected to the sole (12).

22. The dance shoe (5) according to claim 21, characterized in that the toe unit (18) is permanently connected to the sole (12), so that toe unit (18) and sole (12) form a sole/toe unit (10).

23. The dance shoe (5) according to claim 22, characterized in that the toe unit (18) is formed integrally with the sole (12).

24. The dance shoe (5) according to claim 22, characterized in that a toe-protection insert, in particular made of silicon, is arranged in the toe unit (18).

25. A sole/toe unit (10) for use with a dance shoe (5) according to claim 22.

26. An upper shoe (20) for use with a dance shoe (5) according to claim 1.

27. A kit for assembling a dance shoe (5), comprising a sole (12) with an outside (18), extending in longitudinal direction from a back end (12a) to a front end (12b), for which the outside (16) is provided with a plurality of incisions or grooves (17a-g), or a sole/toe unit (10) according to claim 25 and an upper shoe (20) according to claim 26.

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