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(54) **IMPROVED SHIN GUARD AND RELATED MANUFACTURING PROCESS**

VERBESSERTER SCHIENBEINSCHUTZ UND ENTSPRECHENDES HERSTELLUNGSVERFAHREN

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a shin guard.

[0002] The invention also relates to a process for making a shin guard.

[0003] The invention can find advantageous application in the sports sector and in particular in sports where shin guards are usually employed. Examples of such sports are football, five-a-side football, hockey, baseball, cricket, American football and the like.

PRIOR ART

[0004] It is known that shin guards are generally used to protect the shins of users (athletes or not) during the practice of sports where an impact could cause trauma or even serious consequences on the lower limbs of users. Examples of such shin guards can be found in documents of known art US4627108, US5732411 and US5829055.

[0005] Known types of shin guards comprise a one-piece protective shield; such shin guards can be inserted in special socks in correspondence with a suited pocket. Basically, in order to use these shin guards, the user must wear special socks too; this can be uncomfortable in certain sports. Moreover, if these socks are not available, these shin guards become substantially unusable.

[0006] Known types of shin guards also comprise an external one-piece protective shield and an internal rubber lining apt to come into contact, when the shin guards are in use, with the shins of the user. Such shin guards can be secured to the lower limbs by means of proper strap bands, which are usually mutually fastened to the height of the calf of the user.

[0007] Some shin guards also have an anklet that can be worn by the user and that ensures a more stable positioning of the shin guard on the lower limb of the user, preventing annoying upward and downward movements of the shin guard when it is in use.

[0008] The known types of shin guards turn out to be awkward to wear and do not guarantee the necessary comfort to users. In particular, the known types of shin guards do not fit optimally, so that, not adhering perfectly to the shin of the user, they rub on the skin of the user, thus causing annoying irritations and even injuries.

[0009] Document US6,065,152, which discloses the preamble of claim 1, discloses a shin guard divided into a central pad and a pair of lateral pads, intended to protect the user's shin from frontal impacts and from external impacts and internal impacts respectively. The internal lateral pad has a reduced extension with respect to the external lateral pad. Each pad of the shin guard comprises an outer layer of mesh material, an inner layer of resilient foam material and an intermediate layer of rigid material. A flexible joint engages the separation zone between two adjacent portions of the shin guard, being stitched by means of seams to the edges of the outer and inner layers.

[0010] Document US2017/0217126A1 discloses a foam structure that includes a plurality of hexagonal columnar elements, separated from each other by an interspace increasing air permeability. Each columnar element comprises an upper layer and a lower layer both in foam material and an intermediate piece whose opposite faces adhere to the upper layer and to the lower layer respectively. The intermediate pieces are connected with each other by means of connecting segments crossing the interstices between the columnar elements. In order to better withstand to external forces and vibrations, the intermediate pieces and the connecting segments are formed integrally.

AIMS OF THE INVENTION

[0011] The object of the present invention is therefore to solve at least one of the drawbacks and/or limitations of the previous solutions.

[0012] A first object of the present invention is to provide a shin guard that can be worn comfortably by a user and at the same time provide excellent protection to a shin of a user.

[0013] In particular, the present invention aims to provide a shin guard that, by ensuring optimal fit at all times, can prevent the onset of irritation and even injury to the user.

[0014] It is also an object of the present invention to provide a shin guard that can be used by a plurality of users.

[0015] It is an additional object of the present invention to provide a shin guard that is both light and strong, so that it can be worn by a user with a high comfort and may ensure at the same time an effective protection from impacts.

[0016] It is also an object of the present invention to provide a simple and efficient process of making a shin guard.

[0017] Furthermore, it is an object of the invention to provide a shin guard which can guarantee adequate performance even at low or high temperatures, maintaining in particular its breathability and its impact resistance.

[0018] Furthermore, the present invention is functional to allow customization also in the aesthetic rendering of the shin guard.

[0019] The objects described above with reference to a shin guard and the process of making a shin guard are shared by a use of a shin guard and a kit.

[0020] These and other objects, which will become clearer from the following description, are substantially achieved by a shin guard, by a process of making a shin guard, by a use of a shin guard and by a kit.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Some embodiments and some aspects of the

invention as defined by the claims, will be hereafter described with reference to the accompanying drawings, provided only for explanatory and therefore non-limiting purposes, wherein:

- figure 1 is a front view of a shin guard according to a first embodiment of the present invention,
- figure 2 is a rear view of the shin guard of figure 1,
- figure 3 illustrates a shin guard during a step of the manufacturing process of the shin guard according to the first embodiment of the present invention, this step being in particular preliminary to the connection of the padding elements with the respective protective elements, which are illustrated in a rear view,
- figure 4 shows an exploded view of a shin guard according to a second embodiment of the present invention,
- figures 5A, 5B and 5C are views of possible configurations of the shin guard that can be assumed both by a shin guard according to the first embodiment of the present invention, and by a shin guard in accordance with the second embodiment of the present invention,
- figure 6 is a view of shells which can be engaged from the front to respective protective elements of a shin guard according to the first or second embodiment of the present invention.

DEFINITIONS AND CONVENTIONS

[0022] In the present detailed description corresponding illustrated parts in various figures are indicated with the same numerical references. The figures could illustrate the object of the invention by means of not-to-scale representations; therefore, parts and components illustrated in the figures relating to the object of the invention could concern only schematic representations. In the context of this description, the use of terms such as "above", "upper", "higher", "below", "lower", "on the side", "side", "laterally", "horizontal", "horizontally", "vertical", "vertically", "front", "frontally", "rear", "posteriorly" and similar refer, unless otherwise specified, to at least one spatial orientation that normally the object of the invention can adopt in operating conditions or in conditions of use. In this regard, see the attached figures illustrating at least one possible spatial orientation of the object of the invention; in particular, see figures 1, 2 and 3 illustrating the vertical spatial orientation that a shin guard in accordance to the invention can assume when in use.

[0023] Hereinbelow are some definitions that can be used to understand of the present invention:

- the term "shin guard" indicates an item, for example a technical and/or sport item, or a device configured to protect a shin of a user from possible impacts,
- the expression "shin guard module" indicates a modular element of the shin guard. Each shin guard module can comprise assembled components and/or components that can be assembled. Optionally, the shin guard modules can differ from each other due to their shape; for example, adjacent shin guard modules can be complementary in shape.

DETAILED DESCRIPTION

Shin guard

[0024] In the attached figures, the numerical reference 1 overall indicates a shin guard according to the present invention.

[0025] The shin guard 1 is of the modular type. As will be seen in greater detail below, the modularity of the shin guard 1 allows it to adapt to the various shin conformations of a plurality of users. In other words, the modularity of the shin guard 1 allows it to be used by a plurality of users; therefore, the shin guard 1 of the modular type has a wide range of possible uses.

[0026] The shin guard 1 of the modular type comprises shin guard modules 2, 3, 4. In particular, the shin guard 1 comprises at least a first shin guard module 2 and a second shin guard module 3. Each shin guard module 2, 3, 4 is configured to protect, when the shin guard is in use, a portion of a shin of a user. The accompanying figures illustrate embodiments of the shin guard 1 comprising a first shin guard module 2, a second shin guard module 3 and a third shin guard module 4. The number of shin guard modules 2, 3, 4 can be greater than three. From a functional point of view, as the number of shin guard modules 2, 3, 4 increases, the adaptability of the shin guard 1 to the shin of a user increases too; this is possible because, as will be seen in greater detail below, the shin guard modules 2, 3, 4 are relatively movable in order to be able to adapt to the conformation of the shin of a user. Furthermore, as the number of shin guard modules 2, 3, 4 increases, each shin guard module 2, 3, 4 can have a smaller width than the width of shin guard modules 2, 3, 4 of a shin guard 1 having a minor number of shin guard modules 2, 3, 4; this allows, for example, to cover and protect one same surface of the shin of a user (same surface of the shin with respect to the surface protected by a shin guard having a smaller number of shin guard modules 2, 3, 4) through a different number of shin guard modules 2, 3, 4. Alternatively, as the number of shin guard modules 2, 3, 4 increases, the shin guard 1 allows to cover and protect a larger area of the shin of a user (greater surface of the shin with respect to the surface protected by a shin guard having a smaller number of shin guard modules 2, 3, 4).

[0027] In the embodiments illustrated in the attached figures, the first shin guard module is substantially a central shin guard module 2 and the second shin guard mod-

ule and the third shin guard module are lateral shin guard modules 3, 4 opposite to each other with respect to the central shin guard module 2. The central shin guard module 2 and the lateral shin guard modules 3, 4 are configured to be facing, covering and protecting, when in use, respectively a longitudinal central portion and longitudinal lateral portions of the shin of a user. The shin guard modules 2, 3, 4 can have an overall conformation complementing one another, for example a respective overall conformation which allows the shin guard 1 to have a greater width in correspondence of its upper end when compared to the width which it exhibits in correspondence of its own lower end. The upper end and lower end of the shin guard 1 are intended to be respectively positioned, when the shin guard 1 is in use and with reference to body parts of the user, in correspondence of an upper part of the shin close to the knee of the user and in correspondence of a lower part of the shin close to the ankle of the user. The upper end and the lower end of the shin guard are defined with reference to the orientation that the shin guard 1 assumes in its operative configuration; in this regard, see figures 1, 2 and 3. A shin guard 1 is described below, whose modules 2, 3, 4 have a conformation complementary to one another. The central shin guard module 2 can have a tapered conformation which tapers from one end to the other of the central shin guard module 2, while the lateral shin guards modules 3, 4 can be symmetric to one another in their conformation, with a substantially constant width for a prevailing length of the lateral shin guard module 3, 4. The width of the lateral shin guard modules 3, 4 is smaller if compared to an average width of the central shin guard module 2. Being the lateral shin guard modules 3, 4 located at the same distance from the sides of the central shin guard module 2, the lateral shin guard modules 3, 4 are thus shaped to allow the shin guard 1 to have at its upper end a greater width than the width it exhibits in correspondence of its lower end.

[0028] A shin guard module 2, 3, 4 is described below. The technical features of the shin guard module 2, 3, 4 and the related components that will be described with reference to a shin guard module 2, 3, 4 are applicable, except where otherwise indicated, to each shin guard module 2, 3, 4 of the shin guard 1.

[0029] The shin guard module 2, 3, 4 comprises at least one protective element 5. The protective element 5 substantially acts as a shield configured to dampen and/or absorb forces deriving from any possible impacts that can occur on the shin guard module 2, 3, 4 when the shin guard 1 is in use, and thus protects at least one portion of the shin of the user. As illustrated in the attached figures, the protective element 5 has an elongated conformation defined along a longitudinal direction. Having an elongated conformation allows the protective element 5 to cover and protect, when the shin guard 1 is in use, a predominant portion or entirely the respective longitudinal portion of a shin of a user. The protective element 5 develops longitudinally between a first end portion 5a and a second end portion 5b and has a central portion 5c interposed between the first end portion 5a and the second end portion 5b. The protective element 5 has longitudinal edges 6 extending longitudinally and transversal edges 7, extending transversely with respect to the longitudinal edges 6. The transversal edges 7 can be at least partially arched. The protective element 5 with elongated conformation has a greater length than its own width; the length of the protective element 5 can be defined as the distance between longitudinally opposed transversal edges 7, while the width of the protective element 5 can be defined in correspondence of a longitudinal center line of the protective element 5 (half-length of the protective element 5) as the distance between the opposite longitudinal edges 6. For example, the length of the protective element 5 can be at least equal to the double or triple width of the protective element 5. The protective element 5 can have an at least partially concave profile (see figure 4), which allows the protective element 5 to adapt, when the shin guard 1 is in use, to the conformation of the respective longitudinal portion of the shin of a user. Each protective element 5 can advantageously comprise at least one seat 8a, 8b, 8c. The seat 8a, 8b, 8c can develop transversely with respect to the longitudinal direction along which the elongated conformation of the protective element 5 develops. As shown in the attached figures, the seat 8a, 8b, 8c of the protective element 5 of the central shin guard module 2 can extend unbrokenly across opposite transversal edges 7 substantially separated by an entire width of the protective element 5, while the seat 8a, 8b, 8c of the protective elements 5 of the lateral shin guard modules 3, 4 can develop for a portion of the width of the protective element 1 adjacent to the central shin guard module 3, 4. Respective seats 8a, 8b, 8c of the central protective elements 2 and lateral protective elements 3, 4 can be aligned to each other in correspondence of a corresponding portion of the respective protective element 2, 3, 4.

[0030] See figure 4, from which it can be noted that the seats 8a, 8b, 8c can be connected to each other by means of connection seats 77a, 77b, which advantageously extend along a direction which is substantially orthogonal to the development direction of seats 8a, 8b, 8c. Each protective element 5 preferably comprises at least two seats 8a, 8b, 8c longitudinally spaced apart from each other, for example arranged in correspondence of different portions (first end portion 5a, second end portion 5b and central portion 5c) of the protective element 5. In this regard, figure 4 shows protective elements 5, each provided with three seats 8a, 8b, 8c longitudinally spaced apart from each other; essentially, each protective element 5 has a first seat 8a defined in correspondence of the first end portion 5a, a second seat 8b defined in correspondence of the central portion 5c and a third seat 8c defined in correspondence of the second end portion 5b. Figure 4 shows three protective elements 5, one for each of the shin guard modules 2, 3, 4, configured to form, when the shin guard 1 is in use, three seat bands longi-

tudinally spaced apart from each other wherein each band comprises a respective seat 8a, 8b, 8c of each protective element 5 arranged in correspondence of a corresponding portion of the protective elements 5. In particular, a first seat band is defined in correspondence of the first end portions 5a and comprises the first seats 8a of the protective elements 5 of the shin guard modules 2, 3, 4, a second seat band is defined in correspondence of the central portions 5c and comprises the second seats 8b of the protective elements 5 of the shin guard modules 2, 3, 4 and a third seat band is defined in correspondence of the second end portions 5b and comprises the third seats 8c of the protective elements 5 of the shin guard modules 2, 3, 4.

[0031] Each protective element 5 is preferably monolithic. Each protective element 5 is preferably made of material whose rigidity is such that it allows the protective element 5 to damper and/or absorb forces deriving from impacts that can occur when the shin guard 1 is in use without plastically deforming and without breaking.

[0032] In one example, each protective element 5 can be made in plastic or polymeric material; for example, each protective element 5 can be made of polyamide, such as nylon. In an alternative example, each protective element 5 can be made of metallic material, such as aluminum, steel or titanium. In another alternative example, each protective element 5 can be made of leather. In further examples each protective element 5 can be partially made of plastic or polymeric material and partially of metallic material or the shin guard 1 can provide at least one protective element 5 in plastic or polymeric material and at least one protective element 5 made of metallic material so as to differentiate the rigidity of portions of at least one protective element 5 or of the protective elements 5 of the shin guard 1, for example depending on the operating position of the protective elements 5 or of portions thereof with respect to the shin of the user. Providing at least one of the aforementioned plastic, polymeric, metallic or leather materials allows the protective element 5 to be light and at the same time resistant to impacts that can occur when the shin guard 1 is in use. Each protective element 5 can have a thickness between 1 and 5 mm, in particular between 2 and 3 mm. Preferably, each protective element 5 can have a thickness substantially equal to 2.5 mm. Providing a thickness within the thickness ranges described above allows to minimize the material without compromising its impact resistance and therefore allows the protective element 5 to be light and resistant at the same time.

[0033] The shin guard module 2, 3, 4 further comprises at least one padding element 9. The padding element 9 is engaged to the protective element 5; the padding element 9 and the protective element 5 can be engaged either directly or by the interposition of a further component. The padding element 9 is intended to be interposed, when the shin guard is in use, between the protective element 5 and the shin of the user. The padding element 9 is configured to let the user wear the shin guard 1 comfortably, preventing the shin from coming into direct contact with the protective element 5. The padding element 9 is made of material with lower rigidity than the rigidity of the material of the protective element 5. The material of the padding element 9 can deform when in contact with the shin of the user. The padding element 9 has plan dimensions equal to or corresponding to or comparable to the plan dimensions of the protective element 5. The plan dimensions of the padding element 9 have dimensions, such as length and width, substantially equal or corresponding or comparable to the respective dimensions, such as length and width, of the protective element 5 to which the padding element 9 is joined. Such plan dimensions of the padding element 9 allow it, when manufacturing a single module of shin guards 2, 3, 4, to be joined to the respective protective element 5 in correspondence of a prevalent portion of its surface, without it protruding from the plan dimensions of the protective element 9.

[0034] The padding element 9 comprises a padding cushion 9a and a coating 9b matched together. The padding cushion 9a is joined to a respective protective element 5 and is interposed between the coating 9b and the protective element 5. The padding cushion 9a is made of material configured to absorb and dampen forces deriving from impacts; providing at least one padding cushion 9a in such material allows the respective shin guard module 2, 3, 4, and consequently shin guard 1, when in use, to protect the shin of the user from impacts.

[0035] For example, the padding cushion 9a can be made of elastically deformable material, for example in rubber or plastic or polymeric material. In a possible example, the padding cushion 9a can be of ethylene octane (EPDM). The padding cushion 9a can be made of washable material, for example it can be water washed at a temperature close to or equal to 40°C or dry cleaned. The padding cushion 9a can be in breathable and water resistant material and, in addition or in alternative, sweat resistant. The material of the padding cushion 9a can also be impermeable, for example to water and sweat. The padding cushion 9a can be attached in such a way that a portion thereof is recessed with respect to edges of the protective element 5 to which the padding cushion 9a is attached and one further portion thereof protrudes with respect to these edges. The padding cushion can have a thickness between 2 mm and 10 mm, in particular between 4 mm and 8 mm. Preferably, the thickness of the padding cushion can be substantially equal to 6 mm, of which about 2 mm can be recessed with respect to edges 6, 7 of the protective element 5 to which the padding cushion 9a is matched and about 4 mm can protrude from the edges 6, 7 of the protective element 5. The padding cushion 9a and the coating 9b can be joined by using adhesive material such as glue or double-sided tape. When the shin guard 1 is in use, the coating 9b is intended to face the shin of the user and to come into contact with it. Similarly to the padding cushion, the coating can be in washable material. The coating can be in polymeric ma-

terial, such as polyurethane. The coating 9b can have a thickness between 0.5 mm and 2 mm, in particular between 0.6 mm and 1.4 mm. Preferably, the coating 9b can have a thickness substantially equal to 0.8 mm.

[0036] The shin guard module 2, 3, 4 can further comprise at least one shell 10. The shell 10 can be integrated or coupled or couplable to the protective element 5. Figure 6 shows three shells 10, each of which can be coupled to the protective element 5 of the first shin guard module 2, of the second shin guard module 3 and of the third shin guard module 4 respectively, in correspondence of a surface of the respective protective element 5 opposite with respect to the surface of the protective element 5 in correspondence of which the padding cushion 9a of the padding element 9 is engaged. The shell 10 can be permanently coupled to the respective protective element 5, for example by adhesive material such as glue or double-sided tape or by welding, or it can be removably coupled to the respective protective element 5.

[0037] In the example wherein the shell 10 can be removably coupled to the respective protective element 5, the shell 10 can be coupled to the respective protective element 5 if necessary, for example to increase its rigidity, and can be removed from the respective protective element 5 if necessary.

[0038] The shell 10 is configured to stiffen the respective shin guard module 2, 3, 4. For this purpose, the shell 10 can be made of the same material with respect to the protective element 5 or can be made of material having higher rigidity than the material of the protective element 5. Furthermore, the shell 10 can have similar characteristics in terms of materials and thickness to what previously described for the protective element 5. The shell 10 is preferably monolithic. The shell 10 is preferably made of material whose rigidity is such that it allows the shell 10 to dampen and/or absorb forces deriving from impacts that can occur when the shin guard is in use, without plastically deforming and without breaking. In one example, each shell 10 can be made in plastic or polymeric material; for example, each shell 10 can be made of polyamide, such as nylon. In an alternative example, each shell 10 can be made of metallic material, such as aluminum, steel or titanium. In further examples, each shell 10 can be partially in plastic or polymeric material and partially in metal material or the shin guard 1 can provide at least a shell 10 in plastic or polymeric material and at least a shell 10 in metallic material so as to differentiate the rigidity of portions of at least one shell 10 or the shells 10 of the shin guard 1, for example depending on the operative position of the shells 10 or portions thereof with respect to the shin of the user. Providing at least one of the aforementioned plastic, polymeric or metal materials allows the shell 10 to be light and at the same time resistant to impacts that can occur when shin guard 1 is in use. Each shell 10 can have a thickness between 1 and 5 mm, in particular between 2 and 3 mm. Preferably, the shell 10 can have a thickness substantially equal to 2.5 mm. Expecting a thickness within the thickness ranges described above allows to minimize the material without compromising its resistance to impacts and therefore allows the shell 10 to be light and resistant at the same time.

[0039] In order to optimize the user experience, the outermost component of the shin guard 1, which can be the shell 10 in the examples of the shin guard 1 which provide the shell 10 or the protective element 5 in the examples of the shin guard 1 which do not provide the shell 10, can also be personalized or customized, for example by selecting and adding coats of arms, symbols, letters or specific chromatic applications.

[0040] The shin guard 1 further comprises an articulation skeleton 11. The articulation skeleton 11 is made of flexible or swivel material and is engaged at least to the first shin guard module 2 and to the second shin guard module 3 in correspondence of respective surfaces. The articulated skeleton 11 is also engaged to the third shin guard module 5 (see for example figure 3) or to further shin guard modules. Being in flexible or swivel material, the articulation skeleton 11 is configured to allow relative movement between the first shin guard module 2 and the second shin guard module 3 and also the movement of the third shin guard module 4 as regards the first and the second shin guard module 2, 3 or further shin guard modules. The articulation skeleton 11 is configured to assume a plurality of configurations obtainable by means of relative angular movement between the shin guard modules 2, 3, 4 (in this regard, see figures 5A, 5B and 5C). Being in flexible or swivel material, the articulation skeleton 11 allows the shin guard 1 to adapt optimally to the shape of the shin of the user in such a way as to prevent the creation of space between the shin guard 1 and the shin, avoiding the movement of the shin guard 1, which would create actually unwanted sliding between the shin guard 1 and the shin, irritating the skin and annoying the user.

[0041] The articulation skeleton 11 is advantageously made of elastic material. Preferably, the articulation skeleton 11 is made of elastically deformable material, since providing elastically deformable material allows the articulation skeleton 11 to deform reversibly and to move, therefore, the shin guard modules 2, 3, 4 reversibly. The articulation skeleton 11 can be made of at least partially or predominantly rubbery material.

[0042] In the examples of the shin guard 1 illustrated in the attached figures, the articulation skeleton 11 is configured to angularly move the first, the second and the third shin guard module 2, 3, 4 with respect to each other; thus, the articulation skeleton 11 allows to provide flexibility and adaptability of use to the shin guard 1. In this regard, see: figure 5A where the shin guard 1 is in an open configuration wherein the second and third shin guard modules 3, 4 are unfolded with respect to the first shin guard module 2 to form a concavity of the shin guard 1 configured to accommodate, when in use, the shin of the user, figure 5B where the second and third shin guard modules 3, 4 are folded over the first shin guard module 2 to form a kinked configuration of the shin guard 1 and

figure 5C where the second and third shin guard modules 3, 4 are unfolded even further with respect to the open configuration of figure 5A to define a fully open configuration. Basically, the open configuration of figure 5A is an intermediate configuration between the kinked configuration of figure 5B and the fully open configuration of figure 5C. The open configuration of figure 5A can be obtained by unfolding, starting from the kinked configuration of figure 5B, the second and third shin guard module 3, 4 moving away from the first shin guard module 2 and the fully open configuration shown in figure 5C can be obtained by unfolding even further, starting from the open configuration of figure 5A, the second and the third shin guard module 3, 4 with respect to the first shin guard module 2. Conversely, the open configuration of figure 5A can be obtained by folding, starting from the fully open configuration of figure 5C, the second and third shin guard module 3, 4 towards the first shin guard module 2, and the kinked configuration of figure 5B can be obtained by folding even further, starting from the configuration of figure 5A, the second and the third shin guard module 3, 4 towards the first shin guard module 2 until at least one of the second and third shin guard module 3, 4 stops against the first shin guard module 2.

[0043] The articulation skeleton 11 can be constituted by the assembly of a plurality of single elements separated from each other or, alternatively, by a single-piece element, which can reproduce a more complex geometry. The articulation skeleton 11 comprises at least one coupling band 12', 12", 12‴ which connects to each other at least the first and the second shin guard module 2, 3. Devising at least one coupling band 12', 12", 12‴ allows to provide an articulated constraint to the shin guard 1 aimed at improving the shape adaptability of the shin guard 1, optimizing the relative movement between the shin guard modules 2, 3, 4.

[0044] Hereinafter, a coupling band 12', 12", 12‴ is described, connecting the first, the second and third shin guard modules 2, 3, 4. In this regard, see figure 3, wherein the articulation skeleton 11 is assembled to the shin guard modules 2, 3, 4, and figure 4, wherein the articulation skeleton 11 is in exploded view with respect to protective elements 5 and padding elements 9. In alternative examples, the coupling band 12', 12", 12‴ is configured for connecting further shin guard modules 1 together. Besides connecting the shin guard modules 2, 3, 4, the coupling band 12', 12", 12‴ allows to engage the padding elements 9 to the respective protective elements 5. The coupling band 12', 12", 12‴ comprises a first coupling portion 12a, a second coupling portion 12b and a third coupling portion 12c; the first coupling portion 12a is interposed between the second coupling portion 12b and the third coupling portion 12c. The first coupling portion 12a can be defined in correspondence of a central portion of the coupling band 12', 12", 12‴ while the second and third coupling portions 12b, 12c can be defined in correspondence of opposite ends of the coupling band 12', 12", 12'". The first coupling portion 12a is advantageously housed in correspondence of the seat 8b of the protective element 5 of the first shin guard module 2 and engages the padding element 9 of the first shin guard module 2 to the protective element 5 of the first shin guard module 2. Similarly, the second and third coupling portions 12b, 12c can be housed respectively in correspondence of the seats 8a, 8c of the protective elements 5 of second shin guard module 3 and of the third shin guard module 4 and engage the padding element of the second shin guard module 3 and of the third shin guard module 4 respectively to the protective element 5 of the second shin guard module 3 and the third shin guard module 4. It is worth noting how the presence of seats 8a, 8b, 8c on the protective element 5 (although the latter are undoubtedly useful as they are functional to optimize accuracy in positioning and stability of the housing of the coupling bands 12', 12", 12‴) shall not be considered as an essential characteristic of the present disclosure, since the coupling bands 12', 12", 12‴ could alternatively be applied (for example by gluing) to one surface of the protective element 5 devoid of suitable housing means for the coupling bands 12', 12", 12‴.

[0045] Each coupling band 12', 12", 12‴ further comprises at least one connector 12d connecting to each other coupling portions 12a, 12b, 12c adjacent to the coupling band 12', 12", 12‴. Each connector 12d can be separated with respect to the coupling portions 12a, 12b, 12c of the coupling band 12', 12", 12‴ or can be integrated with the coupling portions 12a, 12b, 12c of the coupling band 12', 12", 12‴. In the figures, each coupling band 12', 12", 12‴ is monolithic (meaning that coupling portions 12a, 12b, 12c of the same coupling band 12', 12", 12‴ are part of a single piece) and each connector 12d integrated with the coupling portions 12a, 12b, 12c of the coupling band 12', 12", 12‴ and is formed by a portion of the coupling band 12', 12", 12‴ interposed between the adjacent coupling portions 12a, 12b, 12c. Advantageously, the width of the connectors 12d is a reduced width compared to the prevailing width of the coupling bands 12', 12", 12'", so as to improve the articulation between the shin guard modules 2, 3, 4.

[0046] In the first example, each coupling band 12', 12", 12‴ is monolithic (made up of a respective piece), distinct and separated from the other coupling bands 12', 12", 12‴ (see figure 3). Instead, in the second example all the coupling bands 12', 12", 12‴ are part of a single monolithic articulation skeleton 11 (see figure 4).

[0047] The articulation skeleton 11 can comprise at least a first coupling band 12' and a second coupling band 12", each of which may be of the type described above. The first coupling band 12' and the second coupling band 12" are spaced apart and are engaged, by means of the aforementioned coupling portions 12a, 12b, 12c, to each protective element 5 of said shin guard modules 2, 3, 4, by means of the respective coupling portions 12a, 12b, 12c, in correspondence of respective portions of the same protective element 5 longitudinally spaced apart. For example, the first coupling band 12' and the

second coupling band 12" can be engaged to the respective protective elements 5 in correspondence of two of the central portion 5c, the first end portion 5a and the second end portion 5c. Providing at least one first coupling band 12' and at least a second coupling band 12" engaged in correspondence of respective portions of the same protective element 5 longitudinally spaced apart allows to provide two articulated constraints designed to optimally control the articulation performance of the shin guard 1, optimizing the relative movement between shin guards modules 2, 3, 4. In some examples the first coupling band 12' can be engaged to the protective elements 5 in correspondence of one of the first and the second end portion 5a, 5b and the second coupling band 12" can be engaged in correspondence of the central portion 5c of the protective element 5 (see figures 3 and 4), while in another example the first coupling band 12' is engaged to the protective elements 5 in correspondence of the first end portion 5a and the second coupling band 12" is engaged to the protective elements 5 in correspondence of the second end portion 5b or vice versa. Optionally, the articulation skeleton 11 also comprises further coupling bands 12"'. For example, as illustrated in the examples of figure 3 and figure 4, the articulation skeleton 11 can comprise at least a third coupling band 12‴ of the previously described type. The first coupling band 12', the second coupling band 12" and the third coupling band 12‴ are engaged to the protective elements 5 in correspondence of respective seats bands. By way of example, the first coupling band 12' can be engaged in correspondence of the seats band defined in correspondence of the first end portion 5a of the protective elements 5, the second coupling band 12" can be engaged in correspondence of the seats band defined in correspondence of the central portion 5 of the protective elements and the third coupling band 12‴ can be engaged in correspondence of the seats band defined in correspondence of the second end portion 5b of the protective elements 5; in this regard, see figures 3 and 4. Providing a first coupling band 12', a second coupling band 12" and a third coupling band 12‴ engaged as just described to the protective elements 5 allows to provide three articulated constraints aimed at controlling optimally the articulation performances of the shin guard 1, optimizing the relative movement between shin guard modules 2, 3, 4.

[0048] The coupling bands 12', 12", 12‴ are engaged in correspondence of seats 8a, 8b 8c, of the protective elements 5, so as to arrange the shin guard modules 2, 3, 4 to form a gap 13 between them. As illustrated in the annexed figures, a respective gap 13 is formed between adjacent individual shin guard modules 2, 3, 4; between the first shin guard module 2 and the second shin guard module 3 a gap 13 is formed and between the first shin guard module 2 and the third shin guard module 4 another gap 13 is formed. Such gaps 13 preferably have one same characteristic dimension, such as a width of the gap 13, which can be defined as the distance between the outer facing longitudinal edges 6 of the shin guard modules 2, 3, 4. Providing these gaps 13, in addition to providing the adequate separation between shin guard modules 2, 3, 4 to allow mutual articulation, allows an air passage which, when the shin guard 1 is in use, cooperates in keeping the skin of the user at least partially or substantially dry from sweat. The connectors 12d of the coupling bands 12', 12", 12‴ develop over the gaps and allow, by moving at least one shin guard module 2, 3, 4, to angularly offset the shin guards modules 2, 3, 4 with respect to one another. Basically, the connectors 12d functionally act as hinges and allow angular movement by rotation of the shin guards modules 2, 3, 4 with respect to one another.

[0049] Providing such gaps 13, in correspondence of which a portion of the connector 12d is arranged (see figure 1), also allows to move the shin guard modules 2, 3, 4 in an optimal manner.

[0050] As previously introduced, the first example illustrated in the accompanying figures (see figure 3 in particular) illustrates an articulation skeleton 11 comprising three coupling bands 12', 12", 12‴ distinct and separated from each other, while the second example comprises an articulation skeleton 11 of the monolithic type, wherein the coupling bands 12', 12", 12‴ are connected to each other (see figure 4). In order to connect the coupling bands 12', 12", 12‴, the articulation skeleton 11 can comprise a body 11a. As shown in figure 4, the body 11a connects the first coupling band 12', the second coupling band 12" and the third coupling band 12‴. The body 11a develops substantially parallel to at least one protective element 5 along a longitudinal direction and transversely to the first coupling band 12', to the second coupling band 12" and to the third coupling band 12". The body 11a is preferably joined to the protective element 5 of the first shin guard module 2. As shown in figure 4, the body 11a has a smaller width than a width of the protective element 5 of the central shin guard module 2.

[0051] In order to improve the housing of the articulation skeleton 11 when comprising the body 11a, connection seats 77a and 77b are advantageously obtained on the protective element 5, departing without solution of continuity between the seats 8a, 8b, 8c, so that the assembly of seats on the protective element 5 displays a geometry corresponding to the geometry of the articulation skeleton 11.

[0052] As regards the geometry of the articulation skeleton 11, it is evident that what is described herein and/or what is represented in the attached figures (in particular in figure 4) is to be understood as a possible example and not as a limitation. It can in fact be hypothesized that further bodies (of analogous configuration to the body 11a) can join the portions 12b and/or the portions 12c. It can then further be provided that the articulation skeleton 11 has a significantly different geometry, for example ring shaped, serpentine shaped, and so on.

[0053] The shin guards 1 according to the present invention can be provided in various sizes. Specific sizes can be obtained, for example, according to the target

user for whom the shin guard 1 is conceived. For example, the shin guards 1 can be provided in three different sizes (for example one child size, one adult size and one women size); such sizes can differ in the characteristic dimensions of the shin guard modules 2, 3, 4 and its components (such as the protective elements 5 and the padding elements 9). According to the size of the shin guard 1, the number of coupling bands 12', 12", 12‴ or the distance between coupling bands 12', 12", 12‴ can vary.

[0054] Furthermore, the shin guards 1 can be provided in various versions. Versions can be provided, for example, depending on the sport for which the shin guard is conceived. For example, the shin guards 1 can be provided in a football version, in a hockey version, in a baseball version, in a cricket version, and so on. These versions can differ in at least one of the following: characteristic dimensions of the shin guard modules 2, 3, 4 and their components (such as the protective elements 5 and the padding elements 9), constituent materials of the shin guard modules 2, 3, 4 and related components, such as constituent materials of the protective elements 5, of the padding elements 9 and, if present, of the shells 10, the possible presence of a shell 10, or similar considerations related to the peculiarity of each sport and the foreseeable intensity of possible impacts that the shin of the user may suffer when practicing a particular sport.

Use of the shin guard

[0055] The present disclosure further provides a use of the shin guard 1 previously described. The use of the shin guard 1 is intended to protect a shin of a user. The use of shin guard 1 can be made in the sports sector, for example in sports such as football, hockey, baseball, cricket and the like. It is understood that the use of the shin guard 1 can be made in any activity, sport or discipline in which the shin of a user can be impacted. The use of the shin guard 1 can provide to secure a shin guard 1 to a shin of a user or to secure a pair of shin guards 1, each to a respective shin of the user. The use of the shin guard 1 can also provide to adapt, for example by the user, at least one shin guard 1 to the conformation of the respective shin on which it is worn. The adaptation of at least one shin guard 1 to the conformation of the shin is carried out by relative movement of the first shin guard module 2 and of the second shin guard module 3 and, optionally and where provided, of the third shin guard module 4. The relative movement between shin guard modules 2, 3, 4 is of angular type and provides to angularly offset the shin guard modules 2, 3, 4. The adaptation of at least one shin guard 1 to the shape of the shin provides, in addition to the relative movement between shin guard modules 2, 3, 4, also the movement of at least one of the first shin guard module 2, the second shin guard module 3 and, optionally and where provided, the third shin guard module 4 with respect to the shin of the user.

Kit

[0056] The present disclosure also relates to a kit comprising a pair of shin guards 1 of the type described above. The pair of shin guards 1 comprise a first shin guard 1 of the modular type and a second shin guard 1 of the modular type configured to be secured, when in use, to a respective shin of a user.

Process of making a shin guard

[0057] The present disclosure also relates to a manufacturing process of a shin guard 1 of the type described above. The process provides to arrange shin guard modules 2, 3, 4 of the type described above, and in particular at least a first shin guard module 2, a second shin guard module 3 and also a third shin guard module 4. The step of arranging each shin guard module 2, 3, 4 provides to arrange a shin guard module 2, 3, 4 comprising at least a protective element 5 of the type previously described. Each shin guard module 2, 3, 4 further comprises a padding element 9, of the type previously described, engaged to the protective element 5. Each protective element 5 can be made by arranging sheet material and obtaining, for example by blanking the sheet material, a protective element 5. The sheet material can be in plastic or polymeric material or metallic material or leather. In alternative examples, each protective element 5 can be made by molding plastic or polymeric material or by melting metallic material. The plastic or polymeric or metallic material can be in accordance with what previously described. Each padding element 9 can be arranged through engagement between a padding cushion 9a and a respective coating 9b, both of the type described above; such engagement can be made by means of adhesive material, such as glue or double-sided tape. The step of arranging each shin guard module 2, 3, 4 can provide to join the padding element 9 to the protective element 5 by using adhesive material, such as glue or double-sided tape. For each shin guard module 2, 3, 4, the engagement of the padding element 9 to the protective element 5 provides to join the padding cushion 9a to the protective element 5 so that the padding cushion 9a is interposed between the protective element 5 and the coating 9b.

[0058] The method also provides to arrange an articulation skeleton 11 of the type described above. The procedure provides to engage the articulation skeleton 11 with the protective elements 5 of the first shin guard module 2, the second shin guard module 3 and, where provided, the third shin guard module 4. In the example providing a padding element 9 for each shin guard module 2, 3, 4, the step of engaging the articulation skeleton 11 is preferably carried out prior to the step that provides to engage, for each shin guard module 2, 3, 4, the respective padding element 9 to the respective protective element 5. According to such example, the articulation skeleton 11 is engaged to the protective elements 5 and subsequently the padding elements 9 are engaged to the

respective protective elements 5. Thus, at the end of the assembly, for each shin guard module 2, 3, 4, of the respective protective element 5, of the articulation skeleton 11 and of the respective padding element 9, the articulation skeleton 11 of the shin guard 1 is interposed between the protective elements 5 and the respective padding elements 9. The connection of the articulation skeleton 11 to the shin guard modules 2, 3, 4 provides to engage the coupling portions in correspondence of the respective seats 8a, 8b, 8c, in accordance to what was previously described. In the second example, wherein the articulation skeleton 11 is provided with a body 11a, engaging the articulation skeleton 11 to the shin guard modules 2, 3, 4 also provides for engaging the body 11a to the protective element 5 of the first shin guard module 2. Providing an articulation skeleton 11 equipped with a body 11a engaged to the coupling bands 12', 12", 12‴ allows to engage the articulation skeleton 11 to the protective elements 5 by means of a single coupling operation.

[0059] Optionally, the method can further provide to arrange at least one shell 10 and to couple, in a removable or non-removable way, the shell 10 to the protective element 5 of a shin guard module 2, 3, 4, such as the central shin guard module 2. The process can also provide for arranging additional shells 10 and to couple, in a removable or non-removable way, each shell 10 to the protective element 5 of a respective shin guard module 2, 3, 4. Coupling a shell 10 to a protective element 5 of a shin guard module 2, 3, 4 provides to engage the shell 10 in correspondence of a surface of the protective element 5 which is opposite to the surface of the protective element 5 in correspondence of which the padding element 9 is engaged, in such a way that the protective element 5 is interposed between the shell 10 and the padding element 9.

[0060] As regards the production process of the shin guard 1, it is easily understood that having a one-piece articulation skeleton 11 (such as for example the skeleton represented in figure 4) determines appreciable advantages both as regards the speed of this production process (having a lower number of components to be assembled), both as regards the precision in positioning of the coupling bands 12', 12", 12‴ (being perfectly spaced within the articulation skeleton 11).

ADVANTAGES OF THE INVENTION

[0061] The present invention allows to obtain a shin guard 1 which appears to be adaptable to a plurality of possible different conformations of the shin of a user.

[0062] The invention allows to obtain a shin guard 1 adaptable to the shin of a plurality of users. Therefore, the invention provides a shin guard 1 that can be worn by a plurality of users. The invention presents a shin guard 1 that is light and at the same time robust and capable to dampen and/or absorb forces deriving from impacts and therefore able to protect effectively, when in use, the shin of a user. In order to provide a lightness span of the shin guard 1 according to the invention, in the example wherein the protective element 5 is made of polyamide such as nylon, the padding cushion 9a is in ethylene octane and the coating 9b is in polyurethane, the total weight of protective element 5 and padding element 9 can be between 40 and 50 grams, in particular equal to about 46 grams.

[0063] The present invention also provides a shin guard 1 which can be comfortably worn by a plurality of users.

[0064] Being light and comfortable, the shin guard 1 according to the invention can be worn by a user by offering optimal freedom of movement to users, who may not even notice that they are wearing it.

[0065] The shin guard 1 according to the invention is capable, by means of the articulation skeleton 11, to adapt optimally to the conformation of the shin of the user in such a way that prevents the creation of space between the shin guard 1 and the shin, avoiding the movement of the shin guard 1, a movement which, if present, would in fact create an unwanted sliding between shin guard 1 and the shin, which would cause annoying irritation of the skin of the user.

[0066] The invention therefore provides a shin guard 1 which is comfortable to wear and does not irritate the skin of the user.

[0067] These advantages described with reference to the shin guard 1 are also shared by the process of making the shin guard 1, the use of the shin guard 1 and the kit in accordance with the present disclosure.

[0068] It should be emphasized that the present invention fully achieves its purpose to provide a shin guard that always ensures an optimal fit and consequently prevents the onset of irritation and injuries to those who wear this shin guard. In fact, the modular configuration of the shin guard maximizes the adaptability of the shin guard to the shape of the shin of the user.

Claims

1. Shin guard (1) comprising:

- a first shin guard module (2) and a second shin guard module (3), adjacent to each other, each shin guard module (2, 3) being specifically configured to protect and/or cover, under normal-use condition of the shin guard (1), a portion of a shin of a user, each shin guard module comprising a protective element (5) having an elongated conformation and a padding element (9) intended to be interposed, under normal-use condition of the shin guard (1), between the protective element (5) and the shin of the user, and
- an articulation skeleton (11) in flexible material engaged to the first shin guard module (2) and to the second shin guard module (3) and con-

figured to allow a relative movement between the first shin guard module (2) and the second shin guard module (3) and
- a third shin guard module (4), the first shin guard module (2) being interposed between the second shin guard module (3) and the third shin guard module (4),
characterised in that the padding element (9) is engaged to the protective element (5) and
in that the articulation skeleton (11) is engaged also to the third shin guard module (4), the articulation skeleton (11) being further configured to allow a relative movement between the third shin guard module (4) and the first shin guard module (2).

2. Shin guard (1) according to claim 1, wherein the protective element (5) has an at least partially concave profile.

3. Shin guard (1) according to claim 1 or to claim 2, wherein the padding element (9) comprises a padding cushion (9a) and a coating (9b) coupled to the padding cushion (9a), the padding cushion (9a) being interposed between the coating (9b) and the protective element (5), the coating (9b) being intended to be facing and/or to come into contact with the shin of the user under normal-use condition of the shin guard (1).

4. Shin guard (1) according to anyone of the previous claims, wherein each shin guard module also comprises a shell (10) which can be integrated or coupled to the protective element (5), the shell (10) being configured to stiffen the respective shin guard module, the protective element (5) being interposed between the shell (10) and the padding element (9) in coupling conditions of the shell (10), coats of arms and/or symbols and/or alphanumeric characters and/or chromatic applications being in particular apt to be applied to the shell (10) in order to obtain a customization of said shin guard (1).

5. Shin guard (1) according to anyone of the previous claims, wherein the articulation skeleton (11) comprises a first coupling element (12a) and a second coupling element (12b) configured to be engaged respectively to the first shin guard module (2) and to the second shin guard module (3).

6. Shin guard (1) according to claim 5, wherein each protective element (5) comprises at least one seat housing a corresponding coupling element (12a, 12b, 12c) of the articulation skeleton (11), said at least one seat of the protective element of the first shin guard module (2) housing the first coupling element and said at least one seat of the protective element of the second shin guard module (3) housing the second coupling element.

7. Shin guard according to claim 5 or to claim 6, wherein the articulation skeleton (11) comprises at least one coupling band (12', 12", 12‴) extending transversely with respect to each protective element, the first coupling element being defined by a first coupling portion of said at least one coupling band and the second coupling element being defined by a second coupling portion of said at least one coupling band.

8. Shin guard (1) according to claim 7, wherein the articulation skeleton (11) comprises at least a first coupling band (12') and a second coupling band (12") spaced from each other, each coupling band (12', 12") being engaged to each protective element of said shin guard modules, for example by means of respective coupling portions (12a, 12b), in correspondence with respective portions of the same protective element longitudinally spaced apart.

9. Shin guard (1) according to claim 8, wherein said articulation skeleton (11) comprises at least one connection portion (11a) developing between said first coupling band and said second coupling band.

10. Shin guard (1) according to any one of the preceding claims, wherein the first shin guard module (2) and the second shin guard module (3) are spaced from each other by a gap (13).

11. Shin guard (1) according to claim 10, wherein the first shin guard module (2) and the third shin guard module (4) are also spaced from each other by a gap.

12. Shin guard (1) according to any one of the preceding claims, wherein the first shin guard module (2) and the second shin guard module (3) are configured to be angularly offset from each other by means of the articulation skeleton (11).

13. Shin guard (1) according to any one of the preceding claims, wherein said articulation skeleton (11) has a substantially symmetrical configuration.

14. Shin guard (1) according to claim 13, wherein the shin guard (1) is substantially symmetrical overall.

15. Process for making a shin guard (1), comprising the steps of:

- arranging at least a first shin guard module (2) and a second shin guard module (3),
- arranging an articulation skeleton (11) swivelled and/or in flexible material,
- engaging the articulation skeleton (11) to the first shin guard module (2) and to the second shin guard module (3),

wherein the step of arranging at least a first shin guard module (2) and a second shin guard module (3) comprises arranging, for each shin guard module a protective element (5) having an elongated conformation and a padding element (9) engaged to the protective element (5),
wherein the step of arranging at least a first shin guard module (2) and a second shin guard module (3) also involves arranging a third shin guard module (4) and
wherein the step of engaging the articulation skeleton (11) to the first shin guard module (2) and to the second shin guard module (3) involves engaging the articulation skeleton (11) to the first shin guard module (2), to the second shin guard module (3) and to the third shin guard module (4) in correspondence of respective surfaces.

Patentansprüche

1. Schienbeinschoner (1), umfassend:

- ein erstes Schienbeinschonermodul (2) und ein zweites Schienbeinschonermodul (3), welche einander benachbart sind, wobei jedes Schienbeinschonermodul (2, 3) speziell dazu konfiguriert ist, unter einem normalen Verwendungszustand des Schienbeinschoners (1), einen Abschnitt eines Schienbeins eines Benutzers zu schützen und/oder abzudecken, wobei jedes Schienbeinschonermodul ein Schutzelement (5), welches eine längliche Gestalt aufweist, und ein Polsterungselement (9) umfasst, welches dazu bestimmt ist, unter einem normalen Verwendungszustand des Schienbeinschoners (1), zwischen dem Schutzelement (5) und dem Schienbein des Benutzers eingefügt zu sein, und
- ein Gelenkskelett (11) in einem flexiblen Material, welches mit dem ersten Schienbeinschonermodul (2) und dem zweiten Schienbeinschonermodul (3) in Eingriff steht und dazu eingerichtet ist, eine relative Bewegung zwischen dem ersten Schienbeinschonermodul (2) und dem zweiten Schienbeinschonermodul (3) zu erlauben, und
- ein drittes Schienbeinschonermodul (4), wobei das erste Schienbeinschonermodul (2) zwischen dem zweiten Schienbeinschonermodul (3) und dem dritten Schienbeinschonermodul (4) eingefügt ist,

dadurch gekennzeichnet, dass

das Polsterungselement (9) mit dem Schutzelement (5) in Eingriff steht, und

dadurch, dass das Gelenkskelett (11) auch mit dem dritten Schienbeinschonermodul (4) in Eingriff steht, wobei das Gelenkskelett (11) ferner dazu eingerichtet ist, eine relative Bewegung zwischen dem dritten Schienbeinschonermodul (4) und dem ersten Schienbeinschonermodul (2) zu erlauben.

2. Schienbeinschoner (1) nach Anspruch 1, wobei das Schutzelement (5) ein wenigstens teilweise konkaves Profil aufweist.

3. Schienbeinschoner (1) nach Anspruch 1 oder Anspruch 2, wobei das Polsterungselement (9) ein Polsterungskissen (9a) und eine Beschichtung (9b) umfasst, welche mit dem Polsterungskissen (9a) gekoppelt ist, wobei das Polsterungskissen (9a) zwischen der Beschichtung (9b) und dem Schutzelement (5) eingefügt ist, wobei die Beschichtung (9b) dazu bestimmt ist, unter einem normalen Verwendungszustand des Schienbeinschoners (1), dem Schienbein des Benutzers zugewandt zu sein und/oder mit diesem in Kontakt zu treten.

4. Schienbeinschoner (1) nach einem der vorhergehenden Ansprüche, wobei jedes Schienbeinschonermodul ebenfalls eine Hülle (10) umfasst, welche mit dem Schutzelement (5) integriert oder gekoppelt sein kann, wobei die Hülle (10) dazu eingerichtet ist, das jeweilige Schienbeinschutzmodul zu versteifen, wobei das Schutzelement (5) zwischen der Hülle (10) und dem Polsterungselement (9) in Kopplungszuständen der Hülle (10) eingefügt ist, wobei insbesondere Wappen und/oder Symbole und/oder alphanumerische Zeichen und/oder chromatische Applikationen dazu geeignet sind, auf der Hülle (10) aufgebracht zu sein, um eine Anpassung des Schienbeinschoners (1) zu erhalten.

5. Schienbeinschoner (1) nach einem der vorhergehenden Ansprüche, wobei das Gelenkskelett (11) ein erstes Kopplungselement (12a) und ein zweites Kopplungselement (12b) umfasst, welche dazu eingerichtet sind, mit dem ersten Schienbeinschonermodul (2) bzw. dem zweiten Schienbeinschonermodul (3) in Eingriff zu stehen.

6. Schienbeinschoner (1) nach Anspruch 5, wobei jedes Schutzelement (5) wenigstens ein Sitzgehäuse umfasst, welches ein entsprechendes Kopplungselement (12a, 12b, 12c) des Gelenkskeletts (11) aufnimmt, wobei der wenigstens eine Sitz des Schutzelements des ersten Schienbeinschonermoduls (2) das erste Kopplungselement aufnimmt und der wenigstens eine Sitz des Schutzelements des zweiten Schienbeinschonermoduls (3) das zweite Kopplungselement aufnimmt.

7. Schienbeinschoner nach Anspruch 5 oder Anspruch 6, wobei das Gelenkskelett (11) wenigstens ein Kopplungsband (12', 12", 12‴) umfasst, welches sich transversal in Bezug auf jedes Schutzelement erstreckt, wobei das erste Kopplungselement durch einen ersten Kopplungsabschnitt des wenigstens einen Kopplungsbands definiert ist und das zweite Kopplungselement durch einen zweiten Kopplungsabschnitt des wenigstens einen Kopplungsbands definiert ist.

8. Schienbeinschoner (1) nach Anspruch 7, wobei das Gelenkskelett (11) wenigstens ein erstes Kopplungsband (12') und ein zweites Kopplungsband (12") umfasst, welche voneinander beabstandet sind, wobei jedes Kopplungsband (12', 12") mit jedem Schutzelement der Schienbeinschonermodule in Eingriff steht, beispielsweise mittels jeweiliger Kopplungsabschnitte (12a, 12b), in Übereinstimmung mit jeweiligen Abschnitten des gleichen Schutzelements longitudinal beabstandet.

9. Schienbeinschoner (1) nach Anspruch 8, wobei das Gelenkskelett (11) wenigstens einen Verbindungsabschnitt (11a) umfasst, welcher sich zwischen dem ersten Kopplungsband und dem zweiten Kopplungsband entwickelt.

10. Schienbeinschoner (1) nach einem der vorhergehenden Ansprüche, wobei das erste Schienbeinschonermodul (2) und das zweite Schienbeinschonermodul (3) durch einen Spalt (13) voneinander beabstandet sind.

11. Schienbeinschoner (1) nach Anspruch 10, wobei das erste Schienbeinschonermodul (2) und das dritte Schienbeinschonermodul (4) ebenfalls durch einen Spalt voneinander beabstandet sind.

12. Schienbeinschoner (1) nach einem der vorhergehenden Ansprüche, wobei das erste Schienbeinschonermodul (2) und das zweite Schienbeinschonermodul (3) dazu eingerichtet sind, mittels des Gelenkskeletts (11) winkelmäßig zueinander versetzt zu sein.

13. Schienbeinschoner (1) nach einem der vorhergehenden Ansprüche, wobei das Gelenkskelett (11) eine im Wesentlichen symmetrische Konfiguration aufweist.

14. Schienbeinschoner (1) nach Anspruch 13, wobei der Schienbeinschoner (1) insgesamt im Wesentlichen symmetrisch ist-

15. Verfahren zur Herstellung eines Schienbeinschoners (1), umfassend die folgenden Schritte:

- Anordnen wenigstens eines ersten Schienbeinschonermoduls (2) und eines zweiten Schienbeinschonermoduls (3),
- Anordnen eines Gelenkskeletts (11), schwenkbar und/oder in einem flexiblen Material,
- Ineingriffbringen des Gelenkskeletts (11) mit dem ersten Schienbeinschonermodul (2) und dem zweiten Schienbeinschonermodul (3),

wobei der Schritt des Anordnens wenigstens eines ersten Schienbeinschonermoduls (2) und eines zweiten Schienbeinschonermoduls (3) ein Anordnen, für jedes Schienbeinschonermodul, eines Schutzelements (5), welches eine längliche Gestalt aufweist, und eines Polsterungselements (9) umfasst, welches mit dem Schutzelement (5) in Eingriff steht,

wobei der Schritt des Anordnens wenigstens eines ersten Schienbeinschonermoduls (2) und eines zweiten Schienbeinschonermoduls (3) ebenfalls ein Anordnen eines dritten Schienbeinschonermoduls (4) beinhaltet, und

wobei der Schritt des Ineingriffbringens des Gelenkskeletts (11) mit dem ersten Schienbeinschonermodul (2) und dem zweiten Schienbeinschonermodul (3) ein Ineingriffbringen des Gelenkskeletts (11) mit dem ersten Schienbeinschonermodul (2), dem zweiten Schienbeinschonermodul (3) und dem dritten Schienbeinschonermodul (4) in Übereinstimmung jeweiliger Flächen beinhaltet.

Revendications

1. Protège-tibia (1) comprenant :

- un premier module protège-tibia (2) et un second module protège-tibia (3), adjacents l'un par rapport à l'autre, chaque module protège-tibia (2, 3) étant spécifiquement configuré pour protéger et/ou recouvrir, sous des conditions normales d'utilisation du protège-tibia (1), une portion d'un tibia d'un utilisateur, chaque module protège-tibia comprenant un élément protecteur (5) ayant une conformation allongée et un élément de rembourrage (9) prévu pour être interposé, sous des conditions normales d'utilisation du protège-tibia (1), entre l'élément protecteur (5) et le tibia de l'utilisateur, et
- un squelette d'articulation (11) en matériau souple engagé au niveau du premier module protège-tibia (2) et du second module protège-tibia (3) et configuré pour permettre un mouvement relatif entre le premier module protège-tibia (2) et le second module protège-tibia (3) et
- un troisième module protège-tibia (4), le premier module protège-tibia (2) étant interposé entre le second module protège-tibia (3) et le troi-

sième module protège-tibia (4),
caractérisé en ce que l'élément de rembourrage (9) est engagé au niveau de l'élément protecteur (5) et
en ce que le squelette d'articulation (11) est engagé également au niveau du troisième module protège-tibia (4), le squelette d'articulation (11) étant en outre configuré pour permettre un mouvement relatif entre le troisième module protège-tibia (4) et le premier module protège-tibia (2).

2. Protège-tibia (1) selon la revendication 1, l'élément protecteur (5) ayant un profil au moins partiellement concave.

3. Protège-tibia (1) selon la revendication 1 ou la revendication 2, l'élément de rembourrage (9) comprenant un coussin de rembourrage (9a) et un revêtement (9b) accouplé au coussin de rembourrage (9a), le coussin de rembourrage (9a) étant interposé entre le revêtement (9b) et l'élément protecteur (5), le revêtement (9b) étant prévu pour faire face et/ou pour entrer en contact avec le tibia de l'utilisateur sous des conditions normales d'utilisation du protège-tibia (1).

4. Protège-tibia (1) selon l'une quelconque des revendications précédentes, chaque module protège-tibia comprenant également une coque (10) qui peut être intégrée ou accouplée à l'élément protecteur (5), la coque (10) étant configurée pour raidir le module protège-tibia respectif, l'élément protecteur (5) étant interposé entre la coque (10) et l'élément de rembourrage (9) sous des conditions d'accouplement de la coque (10), des revêtements des bras et/ou des symboles et/ou des caractères alphanumériques et/ou des applications chromatiques étant en particulier aptes à être appliqués à la coque (10) afin d'obtenir une personnalisation dudit protège-tibia (1).

5. Protège-tibia (1) selon l'une quelconque des revendications précédentes, le squelette d'articulation (11) comprenant un premier élément d'accouplement (12a) et un second élément d'accouplement (12b) configuré pour être engagé respectivement au niveau du premier module protège-tibia (2) et au niveau du second module protège-tibia (3).

6. Protège-tibia (1) selon la revendication 5, chaque élément protecteur (5) comprenant au moins une assise logeant un élément d'accouplement correspondant (12a, 12b, 12c) du squelette d'articulation (11), ladite au moins une assise de l'élément protecteur du premier module protège-tibia (2) logeant le premier élément d'accouplement et ladite au moins une assise de l'élément protecteur du second module protège-tibia (3) logeant le second élément d'accouplement.

7. Protège-tibia selon la revendication 5 ou la revendication 6, le squelette d'articulation (11) comprenant au moins une bande d'accouplement (12', 12", 12"') s'étendant transversalement par rapport à chaque élément protecteur, le premier élément d'accouplement étant défini par une première portion d'accouplement de ladite au moins une bande d'accouplement et le second élément d'accouplement étant défini par une seconde portion d'accouplement de ladite au moins une bande d'accouplement.

8. Protège-tibia (1) selon la revendication 7, le squelette d'articulation (11) comprenant au moins une première bande d'accouplement (12') et une seconde bande d'accouplement (12") espacées l'une de l'autre, chaque bande d'accouplement (12', 12") étant engagée au niveau de chaque élément protecteur desdits modules protège-tibias, par exemple à l'aide de portions d'accouplement respectives (12a, 12b), en correspondance des portions respectives du même élément protecteur longitudinalement espacé à l'écart.

9. Protège-tibia (1) selon la revendication 8, ledit squelette d'articulation (11) comprenant au moins une portion de raccordement (11a) se développant entre ladite première bande d'accouplement et ladite seconde bande d'accouplement.

10. Protège-tibia (1) selon l'une quelconque des revendications précédentes, le premier module protège-tibia (2) et le second module protège-tibia (3) étant espacés l'un de l'autre d'un espace (13).

11. Protège-tibia (1) selon la revendication 10, le premier module protège-tibia (2) et le troisième module protège-tibia (4) étant également espacés l'un de l'autre d'un espace.

12. Protège-tibia (1) selon l'une quelconque des revendications précédentes, le premier module protège-tibia (2) et le second module protège-tibia (3) étant configurés pour être décalés de manière angulaire l'un de l'autre à l'aide du squelette d'articulation (11).

13. Protège-tibia (1) selon l'une quelconque des revendications précédentes, ledit squelette d'articulation (11) ayant une configuration sensiblement symétrique.

14. Protège-tibia (1) selon la revendication 13, le protège-tibia (1) étant sensiblement globalement symétrique.

15. Procédé de fabrication d'un protège-tibia (1), com-

prenant les étapes consistant à :

- agencer au moins un premier module protège-tibia (2) et un second module protège-tibia (3),
- agencer un squelette d'articulation (11) escamotable et/ou en matériau souple,
- engager le squelette d'articulation (11) au niveau du premier module protège-tibia (2) et au niveau du second module protège-tibia (3),

l'étape d'agencement d'au moins un premier module protège-tibia (2) et d'un second module protège-tibia (3) consistant à agencer, pour chaque module protège-tibia un élément protecteur (5) ayant une conformation allongée et un élément de rembourrage (9) engagé au niveau de l'élément protecteur (5),

l'étape d'agencement d'au moins un premier module protège-tibia (2) et un second module protège-tibia (3) impliquant également l'agencement d'un troisième module protège-tibia (4) et l'étape d'engagement du squelette d'articulation (11) au niveau du premier module protège-tibia (2) et au niveau du second module protège-tibia (3) impliquant l'engagement du squelette d'articulation (11) au niveau du premier module protège-tibia (2), au niveau du second module protège-tibia (3) et au niveau du troisième module protège-tibia (4) en correspondance des surfaces respectives.

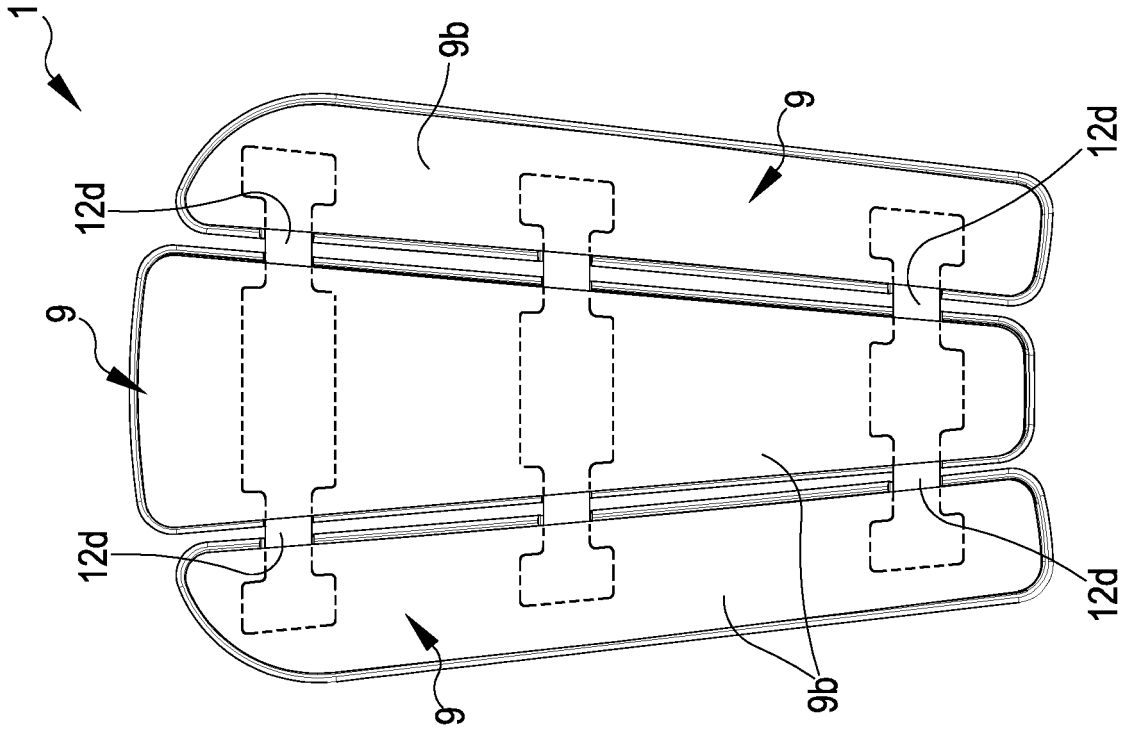

1
9b
9
12d
12d
9
12d
12d
9
9b

FIG.2

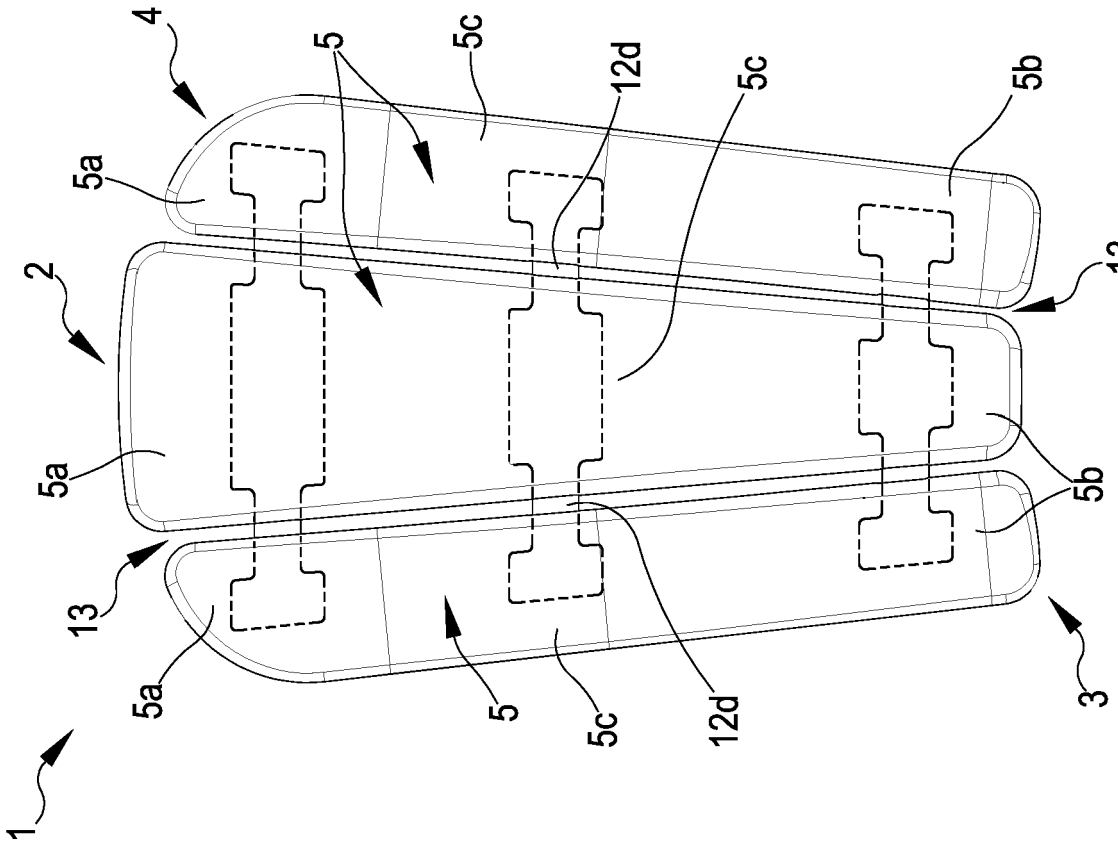

4
5
5c
12d
5c
5b
5a
2
13
5a
5b
13
5a
5
5c
12d
3
1

FIG.1

FIG.3

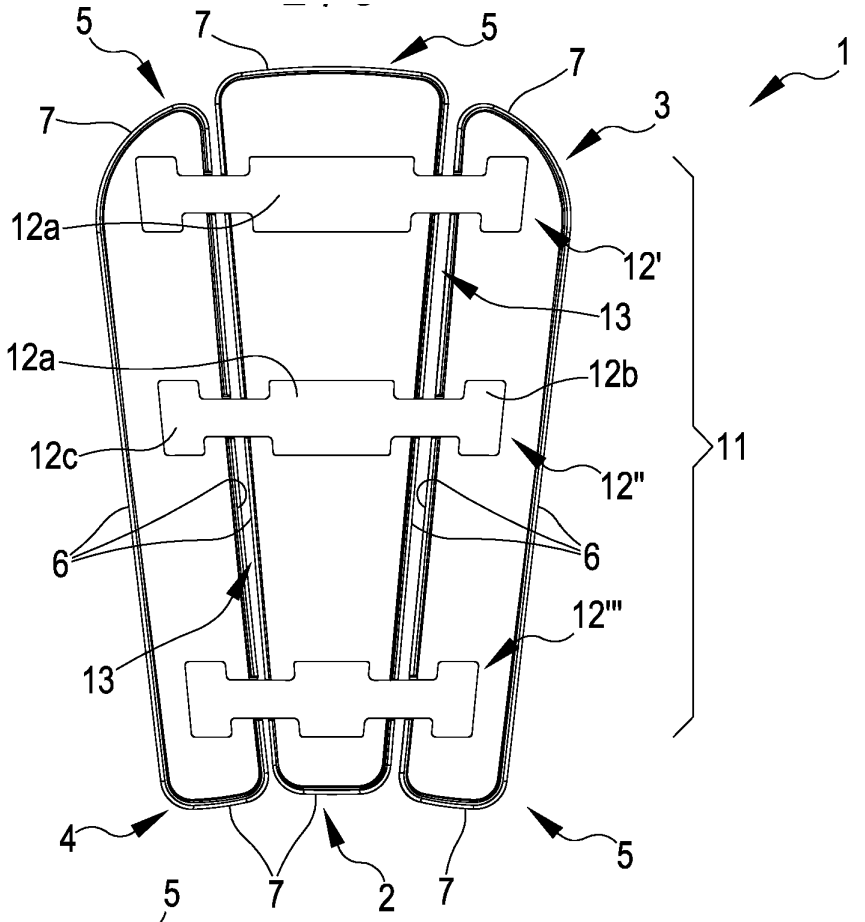

5
7
5
7
1
7
3
12a
12'
13
12a
12b
12c
11
12"
6
6
12'''
13
4
7
2
7
5

FIG.4

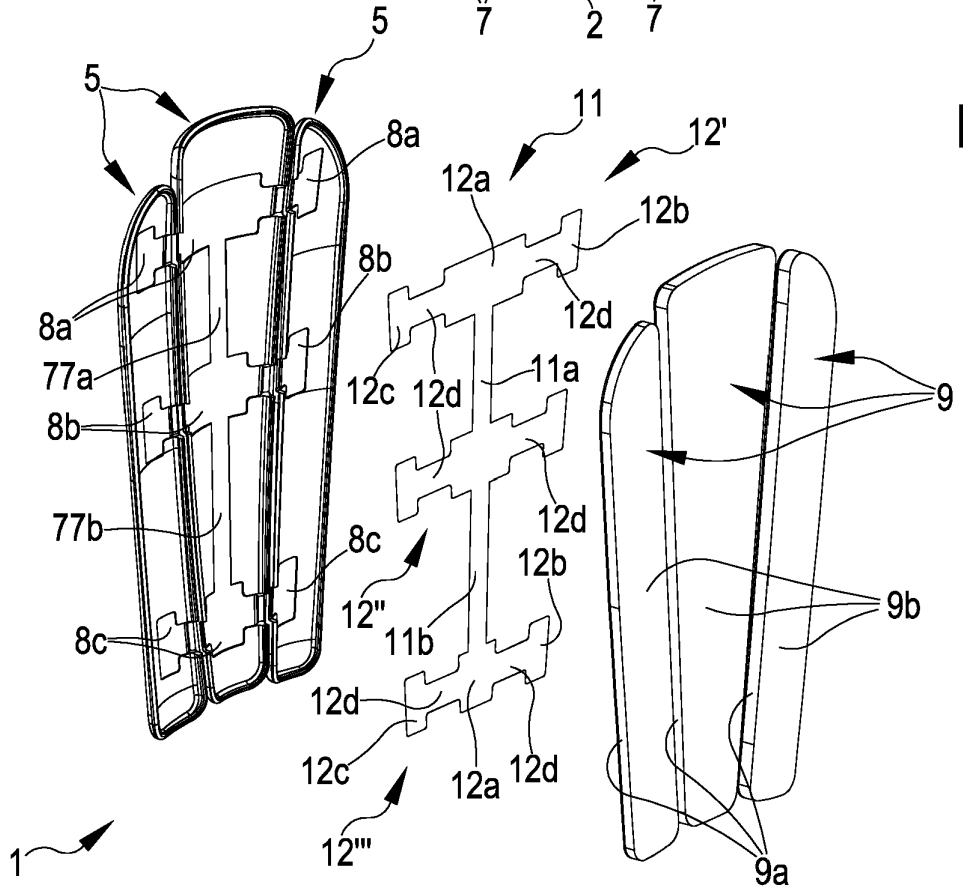
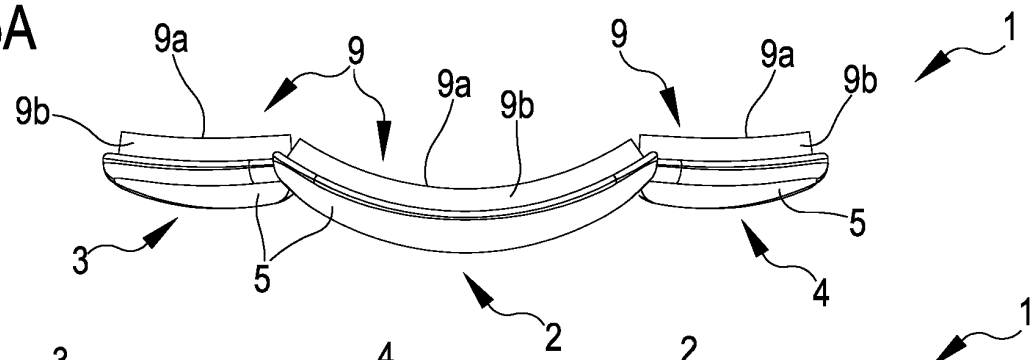

5
5
8a
11
12'
12a
12b
8b
8a
12d
77a
12c
12d
11a
9
8b
77b
12d
8c
12b
12"
11b
9b
8c
12d
12c
12a
12d
12'''
1
9a

FIG.5A



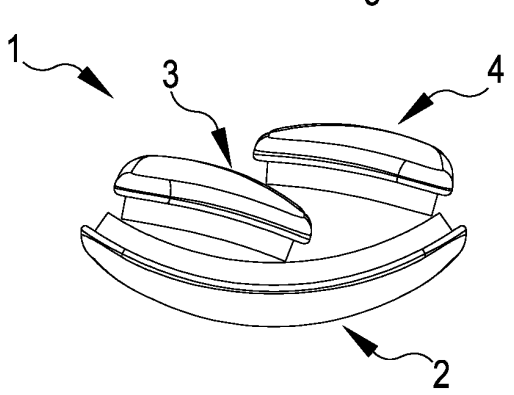


FIG.5B

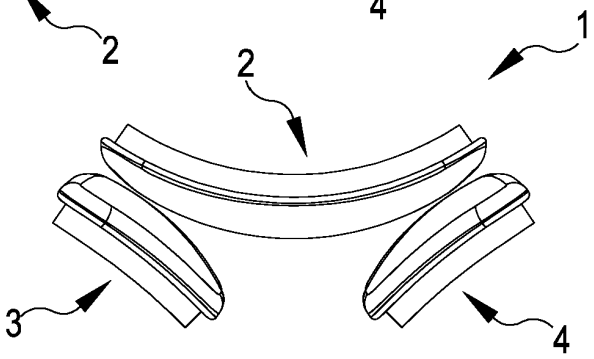
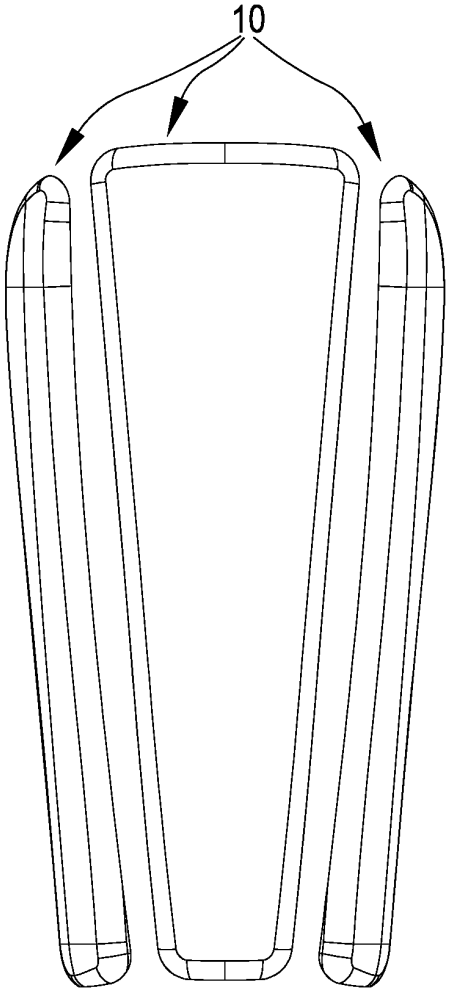


FIG.5C

FIG.6



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