



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.06.2022 Bulletin 2022/26

(51) International Patent Classification (IPC):
A41D 13/015 ^(2006.01) **A41D 13/06** ^(2006.01)
A41D 13/08 ^(2006.01) **A41D 13/05** ^(2006.01)

(21) Application number: **21216626.8**

(52) Cooperative Patent Classification (CPC):
A41D 13/0153; A41D 13/0156; A41D 13/0556;
A41D 13/065; A41D 13/08; A41D 2600/102

(22) Date of filing: **21.12.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **23.12.2020 IT 202000032246**

(54) **SLIDING MEMBER**

(57) The present disclosure relates to a sliding member or slider (12) having a cover portion (121) intended during use to come into contact with a road surface so as to facilitate sliding thereof, and a support portion (122)

supporting said cover portion (121). Said support portion (122) has a plurality of lightening cavities (123). The present disclosure also relates to a protection device and a protective garment each including said sliding member.

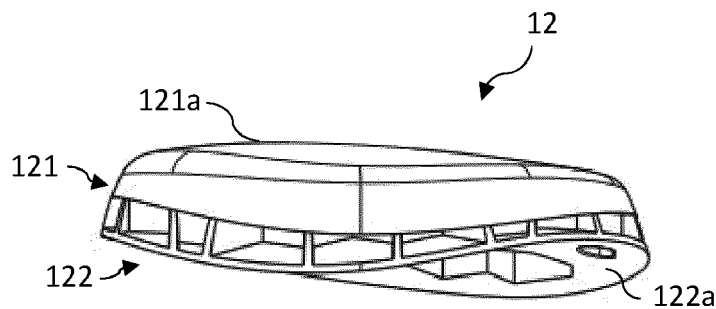


Fig. 5

Description

DESCRIPTION

[0001] The present disclosure relates in general to the sector of protective garments, in particular for motorcycling activities, such as a motorcycling suit or jacket. More specifically, the present disclosure relates to a so-called sliding member or slider and a protective garment including such a sliding member.

[0002] As is known, motorcycling racing suits are provided with protection devices comprising a member with a low coefficient of friction, these having the function of preventing the protective garment from coming into direct contact, in the knee zone, with the asphalt when the rider is riding around a bend with the knee projecting and the motorcycle inclined, and therefore of effectively helping sliding of the knee and protecting the garment from abrasion. In other words, these protection devices have the function of protecting the protective garment from any abrasion caused by the said garment coming into sliding contact with the racing track or road surface. These members are referred to in the technical jargon as "knee sliders", Similar devices exist for the arm, these being situated, during use, in the elbow region.

[0003] The present disclosure is based on the recognition by the author that the sliding member may be improved in order to improve the riding performance of a motorcyclist wearing a motorcycling garment.

[0004] A technical problem underlying the present disclosure is that of providing a sliding member or slider which may help improve the riding performance of a user who is wearing a protective garment provided with said sliding member.

[0005] The present disclosure aims to provide a protective device which is able to solve said technical problem with reference to the prior art and/or to achieve further advantages.

[0006] This is obtained by means of a sliding member or slider, a protection device, a protective garment and a use as defined in the respective independent claims. Secondary characteristics and particular embodiments of the subject of the present invention are defined in the corresponding dependent claims.

[0007] The present disclosure is based on the recognition that the weight of a sliding member or slider may also affect the overall weight of the suit or the protective garment being worn, an excessive overall weight having a negative effect on the performance of a motorcycle rider. In particular, an excessive weight in the region of the leg or the arm, where a protection device comprising a sliding member or a slider is intended to be associated with the protection garment, may cause a rider to lose balance or hinder his/her movements especially when travelling around bends. It should be considered that overall the weight of a motorcyclist's racing suit including the protection devices, such as those including a sliding member or slider, may range from 3.5 kg to as much as

about 6 kg and that by adjusting the specific weight of the sliding member or slider it is possible to reduce in a localized manner the overall weight of the garment even by 50 grammes or more. It is therefore possible to reduce the weight in the region of the knee or the elbow so as to favour the agility of the rider.

[0008] In particular a sliding member having a structure which is particularly light, but which at the same time ensures rigidity and abrasion resistance, is provided.

[0009] More specifically, a sliding member or slider according to the present disclosure comprises:

- a cover portion, intended during use to come into contact with a road surface so as to assist sliding along the road surface and provide protection against abrasion, and a support portion, intended to act as a support for the cover portion and intended to face, during use, the protective garment to which the sliding member or slider is fixed.

and wherein said support portion has a plurality of lightening cavities.

[0010] The assembly consisting of the support portion and the cover portion forms an article which is structurally independent and can be separately handled as a single unit in relation to the protective garment.

[0011] Preferably, the support portion is a reticular body including a plurality of partitions or separation walls which alternate with the lightening cavities. In other words, preferably, the support portion has a form and size which are comparable to that of the cover portion, but however is not a solid body, but is a reticular body. In other words, the reticular body has cavities distributed throughout the reticular body. In other words, the support portion has a reticular structure, namely the support structure comprises a plurality of empty spaces, namely spaces without material, corresponding to the lightening cavities, alternating with solid spaces, namely the meshes of the reticular structure. The reticular structure defines a plurality of dividing walls or partitions between the cavities which in turn act as a support for the cover portion. In other words, the reticular form defines partitions between the cavities which in turn act as a support and allow lightening which is spread out, but without a reduction in the solidity of the support,

[0012] The plurality of lightening cavities coincides with or corresponds to a plurality of empty spaces, namely spaces without material, in the support portion. The absence of material in some spaces or regions of the support portion makes the latter particularly light. As a result, overall, it is possible to obtain an effect of lightening the sliding member or slider. In turn, this lightening effect results in a reduction in the weight of the entire protective garment. In particular, this lightening effect will be advantageously perceived in the region of the motorcyclist's elbows or knees, namely the portions of the protection garment with which this device is associated during use.

[0013] Preferably, the reticular structure is such that

the lightening cavities or empty spaces are greater than the solid spaces in the support portion. This allows the lightness of the support portion to be maximized, while ensuring the solidity and support function provided by the structure.

[0014] According to a preferred aspect of the present disclosure, the lightening cavities are distributed in a substantially homogeneous or uniform manner. As a result, the reticular structure has lightening cavities which are uniformly distributed in the reticular body. Namely, the lightening cavities are defined or formed in a regular manner in the support portion. In other words, the lightening cavities are distributed in a substantially regular pattern. In this way homogeneous structural lightening is obtained. Therefore, there is no risk that some zones of the knee or elbow, where the protection device, during use, is applied to the protection garment, are heavier than other zones. A weight imbalance in the knee or elbow regions, where the protection device during use is applied to the protection garment, is thus avoided. This advantageously results in a benefit in terms of performance for the user.

[0015] The cover portion is a portion intended during use to have a friction surface. When the sliding member or slider is associated with the protective garment, the friction surface is a visible surface.

[0016] According to a preferred aspect of the present disclosure, the cover portion and the support portion are configured to be joined together in a reversible manner, so as to form the aforementioned part which may be separately handled. According to this preferred aspect, therefore, the cover portion and the support portion each consist of a body which can be separately handled and may be joined together and separated, as required. Consequently, it is advantageously possible to remove and replace only the cover portion once it has become worn. In addition, since the cover portion and the support portion are two separate bodies, they may be easily made of different materials which are specially chosen depending on the specific functions which each portion must perform or depending on other design criteria. For example, the support portion need not also be made of a particularly abrasion-resistant material, as instead is required for the cover portion.

[0017] According to a preferred aspect of the present disclosure, the cover portion and the support portion are provided with a reversible engaging and locking system. The cover portion and the support portion are therefore specifically provided with a system so that they may be joined together and separated from each other so as to allow advantageously, as mentioned above, the replacement of only one of the two portions.

[0018] According to a preferred aspect of the present disclosure, one of the support portion and the cover portion includes at least one hole and at least one retaining element and the other one of the support portion and the cover portion includes at least one insertion body, or key, designed to be inserted in the hole and wherein the re-

taining element is configured to cooperate with the insertion body so as to retain the latter inside the hole. In other words, the reversible engaging and locking system comprises a female element or component, namely a hole, and a male element or component, namely an insertion body or key, which are configured to provide a form-fitting joint. In addition, the reversible engaging and locking system comprises a retaining element configured to cooperate with the male element or component so as to prevent the latter from coming out of this female element or component. Since it consists of a reversible connection, the retaining element therefore acts as a selective retaining element. In fact, by applying a separating force or stress it is possible to overcome the locking action exerted by the retaining element and thus release the male component, namely the insertion body, from the female component, namely the hole.

[0019] According to a preferred aspect of the present disclosure, the insertion body includes a cylindrical portion and a head portion which extends radially from the cylindrical portion. In other words, the insertion body is mushroom-shaped.

[0020] According to a preferred aspect of the present disclosure, the hole includes a first region, a second region and a third region communicating with each other. In particular:

- the first region is configured to allow the insertion and extraction of the insertion body;
- the second region is configured to allow the cylindrical portion to slide therein along a sliding direction and to prevent the head portion from moving away along a direction orthogonal to the sliding direction; and finally
- the third region is configured to accommodate or receive the cylindrical portion and prevent the head portion from moving away along a direction orthogonal to the sliding direction.

[0021] In order to join together the cover portion and the support portion, the insertion body must be introduced or inserted inside the first region of the hole, and slid within the second region until it reaches the third region. The insertion body may not be pulled out from the second and the third region of the hole in a direction orthogonal to the sliding direction. In order to extract the insertion body and allow release or disengagement of the insertion body from the hole, the insertion body must therefore be positioned in the first region.

[0022] According to a preferred aspect of the present disclosure, the retaining element is a retaining tooth which projects or protrudes inside the hole and is arranged straddling, or on the border between, the second region and the third region. As a result, the retaining tooth and the third region form together a retaining seat designed to retain the insertion body until a separation force or stress is exerted.

[0023] According to this preferred aspect of the present

disclosure, the retaining tooth is also configured to allow sliding of the insertion body from the second region to the third region of the hole and to oppose the sliding of the insertion body from the third region to the second region of the hole. In other words, the tooth is configured to offer resistance to a displacement of the insertion body in a direction opposite to the sliding direction. During normal use, namely during the motorcycling activity, the retaining tooth exerts an opposing action which prevents the insertion body from returning or retracting freely towards the first region.

[0024] According to a preferred aspect of the present disclosure, the retaining tooth is elastically deformable. That is to say, advantageously, the retaining tooth may be selectively deformed in order to allow the insertion of the insertion body inside the third region and allow the removal or the extraction of the insertion body from the third region. Expressed differently, this allows if necessary the insertion body to be retained inside the third region and therefore the cover portion and the support portion to be kept joined together, or else this allows the insertion body to be positioned in the first region and therefore the cover region and the support portion to be separated from each other.

[0025] Finally, the present disclosure also relates to a protection device which includes a sliding member according to one or more of the aspects described here and a base for connection to a garment, and a protective garment comprising the protection device. In particular, the protective garment is intended to be used in the sector of motorcycling activities.

[0026] Further characteristic features and modes of use forming the subject of the present disclosure will become clear from the following detailed description of embodiments thereof, provided by way of a non-limiting example.

[0027] It is any case evident that each embodiment of the subject of the present disclosure may have one or more of the advantages listed above; in any case it is not required that each embodiment should have simultaneously all the advantages listed.

[0028] Reference will be made to the figures of the attached drawings in which:

- Figure 1 shows a view of a motorcyclist provided with a protective garment and protection devices comprising sliding members or sliders;
- Figure 2 shows a view of a motorcyclist's suit provided with protection devices comprising sliding members or sliders;
- Figure 3 shows a plan view of a protection device according to an embodiment of the present disclosure;
- Figure 4 shows a perspective view from above of a sliding member according to an embodiment of the present disclosure;
- Figure 5 shows a first perspective view from below of a sliding member according to an embodiment of

the present disclosure;

- Figure 6 shows a second perspective view from below of a sliding member according to an embodiment of the present disclosure;
- 5 - Figure 7 shows a view from below of a sliding member according to an embodiment of the present disclosure;
- Figure 8A shows a view from above of a sliding member according to an embodiment of the present disclosure;
- 10 - Figure 8B shows a cross-sectioned view of the sliding member of Figure 8A along the axis A-A;
- Figure 8C shows a cross-sectioned view of the sliding member of Figure 8A along the axis B-B;
- 15 - Figure 9 shows a side view of a cover portion of a sliding member according to an embodiment of the present disclosure;
- Figure 10 shows a second side view of a cover portion of a sliding member according to an embodiment of the present disclosure;
- 20 - Figure 11 shows a view from above of a cover portion of a sliding member according to an embodiment of the present disclosure;
- Figure 12 shows a perspective view from above of a cover portion of a sliding member according to an embodiment of the present disclosure;
- 25 - Figure 13 shows a view from below of a cover portion of a sliding member according to an embodiment of the present disclosure;
- 30 - Figure 14 shows a perspective view from below of a cover portion of a sliding member according to an embodiment of the present disclosure;
- Figure 15 shows a first side view of a support portion of a sliding member according to an embodiment of the present disclosure;
- 35 - Figure 16 shows a second side view of a cover portion of a sliding member according to an embodiment of the present disclosure;
- Figure 17 shows a view from above of a support portion of a sliding member according to an embodiment of the present disclosure;
- 40 - Figure 18 shows a perspective view from above of a support portion of a sliding member according to an embodiment of the present disclosure;
- 45 - Figures 19A and 19B show, respectively, a view from above and a view from below of a first step for joining together a cover portion and a support portion of a sliding member according to an embodiment of the present disclosure;
- 50 - Figures 20A and 20B show, respectively, a view from above and a view from below of a second step for joining together a cover portion and a support portion of a sliding member according to an embodiment of the present disclosure;
- 55 - Figures 21A and 21B show, respectively, a view from above and a view from below of a third step for joining together a cover portion and a support portion of a sliding member according to an embodiment of the

present disclosure.

[0029] With reference to the attached figures, a sliding member or slider 12, which may form part of a protection device, is described.

[0030] An embodiment of a protection device is denoted overall by the reference number 10 and an embodiment of a garment comprising this protection device is denoted overall by the reference number 1.

[0031] More particularly, with reference to the attached figures, a protection device 10, 11 including the sliding member or slider 12 is described.

[0032] The protection device 10 is configured to be associated with or fixed to a protective garment 1. In particular, the protective garment is a garment for motorcycling activities, such as a motorcycling suit or jacket. The protective garment 1 comprises at least one arm portion 2a and at least one leg portion 2b intended respectively to receive an arm of the user and a leg of the user.

[0033] The protection device 10 according to the present disclosure can be fixed to at least one arm portion 2a and the protection device 11 according to the present disclosure can be fixed to the leg portion 2b. In particular, the protection device 10 can be fixed in the elbow region, while the protection device 11 can be fixed in the knee region. In the description below, for simpler illustration, reference will be made without distinction to one of the two protection devices 10, 11 as sliding member or slider, it being understood that this term is applicable also to the other device.

[0034] Each protection device 10, 11 according to the present disclosure includes a sliding member or slider 12 and a base body or base 13.

[0035] The base 13 is configured to be associated with or fixed to a protective garment 1. The sliding member 12 is configured, in turn, to be fixed to the base body 13.

[0036] Therefore, the base 13 acts as support body for the sliding member 12.

[0037] In particular, the sliding member 12 comprises a cover portion 121 and a support portion 122.

[0038] The cover portion 121 is intended, during use, to be directed towards and to come into contact with a road surface such as a track surface or road surface. It therefore constitutes the abrasion surface or zone. The cover portion 121 therefore forms part of the sliding member 12 which is subject to a high degree of wear owing to the friction with the track surface or road surface. The cover portion 121 acts as, or forms, a layer which covers or lines the sliding member 12. In other words, the cover portion 121 is intended, during use, to come into contact with a road surface and help sliding along the road surface and protect the protective garment from abrasion.

[0039] The support portion 122 can be fixed to the base and, in this way, during use is interposed between the latter and the cover portion 121. The support portion 122 during use is therefore positioned between the cover portion 121 and the base 13. The support portion 122 is also configured to connect operationally the cover portion to

the base 13 and therefore to the protective garment 1. The support portion 122 therefore acts as or forms a layer supporting or acting as a base for the sliding member 12. The support portion is therefore intended to face said protective garment and to support said cover portion 121.

[0040] The support portion 12 has, namely is provided with, a plurality of lightening cavities 123. "Lightening cavity 123" is understood, in the context of the present disclosure, as referring to an empty space, namely a space devoid of material, in the support portion 122. Owing to the presence of the lightening cavities 123, the support portion 122 is particularly light. This results, generally, in lightening of the sliding member 12 and therefore of the protection device 10.

[0041] According to a preferred aspect, the cover portion 121 does not have lightening cavities 123. Namely the cover portion is a portion full of material, i.e. a solid portion, so as to guarantee the abrasion-protection function.

[0042] According to a preferred aspect, the lightening cavities 123 are distributed in a substantially uniform or homogeneous manner. In other words, the lightening cavities 123 are distributed spatially in a more or less regular or constant manner. In this way, the weight of the support portion 122 is distributed uniformly or homogeneously.

[0043] According to a preferred aspect, the support portion 122 comprises or has a reticular structure. "Reticular structure" is understood as meaning a structure having a plurality of solid spaces and empty spaces alternating with each other. According to this preferred aspect, the plurality of lightening cavities 123 corresponds to or coincides with the empty spaces of the reticular structure. In particular, the reticular structure is formed by a plurality of meshes formed by sections or segments of material which are connected so as to be linked together or intersect each other and are arranged alternating with a plurality of spaces devoid of material or empty. In other words, each lightening cavity 123i corresponds to, namely is, the space inside a respective mesh. In yet other words, each mesh of the plurality of meshes surrounds or circumscribes one of the lightening cavities 123.

[0044] It may be stated that the reticular structure has meshes or dividing walls or partitions which divide/define the cavities and act as uprights/supports for the cover portion. The reticular structure provides the support portion with rigidity, while ensuring its lightness. Preferably, the empty spaces are bigger than the solid spaces. In other words, the plurality of lightening cavities 123 occupies a volume or space which is bigger than a space occupied by the separating walls or partitions of the support portion. This allows the support portion to have a maximum supporting function, while having a minimum weight.

[0045] Preferably, according to this aspect, the reticular structure comprises polygonal meshes. For example, the meshes may be triangular, quadrangular, pentagonal

or hexagonal. In particular, in the case where the meshes are hexagonal, the reticular structure is in the form of a honeycomb structure. Alternatively, the reticular structure comprises circular meshes. Alternatively, it comprises a combination of differently shaped meshes. Basically, preferably said reticular structure defines partitions or separating walls between the cavities and these walls or partitions act as a support for the cover portion 121. In other words, the support portion 122 has a plurality of walls or ribs which extend from an upper surface of the support portion facing the cover portion towards a bottom surface opposite to said upper surface, wherein said walls or ribs separate the plurality of lightening cavities 123.

[0046] Preferably, the reticular structure of the support portion 122 has a free edge situated between the upper surface and the bottom surface, and the plurality of lightening cavities 123 are open towards said free edge.

[0047] The base 13, as mentioned, can be fixed to the protective garment 1. As shown in the drawings, according to a preferred aspect of the present disclosure, the base 13 can be fixed to an inner side of a layer 2 of the protective garment 1. The inner side coincides with the side of the layer 2 which, during use, is intended to be directed towards or facing the user. In other words, the layer 2 of the protective garment 1, during use, is interposed between the sliding member or slider 12, in particular the support portion 122, and the base 13.

[0048] The lightening cavities are preferably open towards the cover portion and closed towards the base 13, namely towards an inner surface 122a.

[0049] According to a preferred aspect, the sliding member or slider 12 is removably fixed to the base 13. In particular, the support portion 122 can be removably fixed to the base 13. This is particularly useful for allowing the replacement of the sliding member or slider 12. The removable fixing system may be realized by means of Velcro® joining elements or threaded joining elements or by means of a bayonet-type joint. In particular in the case of threaded joining elements or a bayonet-type joint, the layer 2 may include a through-hole designed to allow the engagement of the support portion 122 in the base 13.

[0050] According to a preferred aspect, the base 13 is a plate-shaped body.

[0051] According to a preferred aspect, the sliding member or slider 12 is a monolithic body, namely consists of a single piece. In other words, the cover portion 121 and the support portion 122 are made by means of a production process which forms a single piece. Namely the cover portion 121 and the support portion 122 are integral with each other or are made as one piece. As a result, the cover portion 121 and the support portion 122 cannot be separated from each other, other than by breaking the material joining them together and thereby damaging the functionality thereof. Therefore, once the cover portion 121 has become worn, the support portion 121 must also be replaced.

[0052] Since they are made integrally, namely as one

piece, the cover portion 121 and the support portion 122 are made of the same material.

[0053] Alternatively, according to a different preferred aspect, the cover portion 121 and the support portion 122 are configured to be joined together in a reversible manner. The cover portion 121 and the support portion 122 are configured, that is, to form a reversible joint or a releasable joint. The joint formed between the cover portion 121 and the support portion 122 is, namely, of a temporary nature until a separating movement or force is applied to both - or either one of - the cover portion 121 and the support portion 122. The cover portion 121 and the support portion 122 are, in other words, configured to allow separation or disengagement after being joined together. In this way the mutual separation of the cover portion 121 and the support portion 122 is possible, without damaging the functionality thereof. Consequently, the replacement of the cover portion 121 alone, i.e. the portion which is subject to abrasion, is made possible without having to replace at the same time also the support portion 122.

[0054] The present disclosure therefore relates also to the use of only the cover portion 121 for the purposes of replacement.

[0055] According to this preferred aspect, the cover portion 121 and the support portion 122 each consist of a body which can be separately handled. Preferably, both the cover portion 121 and the support portion 122 are both substantially plate-shaped bodies, obviously with a form and profile typical of that of a sliding member. Even more preferably, at least the outer surface 122a of the support portion 122 is slightly curved so as to adapt anatomically to the form of the user's knee or elbow. The support portion 122 therefore has a slightly C-shaped or U-shaped profile at least on its outer surface 122a. Alternatively, the support portion 122 has an inner surface 122a which is substantially and at least partially planar or flat and/or is designed to rest completely on a corresponding support surface of the base 13. In other words, the inner surface 122a follows a flat trajectory or path. It is also possible for the inner surface 122a to be provided with knurling or a non-smooth surface.

[0056] According to a preferred aspect, the cover portion 121 has an outer surface 121a, which forms part of the cover portion 121 intended to come into contact with the road surface and an opposite connecting surface 121b configured to be joined together with the support portion 122. Similarly, the support portion 122 has in turn a connecting surface 122b and an on opposite outer surface 122a configured to be associated with the base 13.

[0057] Moreover, preferably, the cover portion 121 is preferably made of material with a low friction coefficient. For example, the cover portion 121 may be made of plastic material, such as high-strength polyurethane. If necessary, in order to increase the abrasion resistance, the outer surface of the cover portion, i.e. that which is subject to abrasion, has a region made of Teflon.

[0058] Preferably, the support portion 121 is preferably

made of polymeric material. For example it may be made of heat-hardened polyurethane.

[0059] According to a preferred aspect, the cover portion and the support portion 122 are provided with a reversible engaging and locking system 20. Preferably, this reversible engaging and locking system 20 is provided on the connecting surface 121b, 122b of the cover portion 121 and support portion 122, respectively.

[0060] According to a preferred aspect, the joint between the support portion 121 and the cover portion 122 is a form-fitting joint.

[0061] According to a preferred aspect, either one of the support portion 122 and the cover portion 121 includes at least one hole 22 and at least one retaining element 23. The other one of the support portion 122 and the cover portion 121 includes at least one insertion body 24 or key, namely a male component or element, designed to be inserted inside the hole 22. In other words, one of the support portion 122 and the cover portion 121 comprises a female component or element and the other one comprises a male component or element, which are configured to cooperate together. In addition, the sliding member portion or slider 12 which has a hole 22 is provided with a retaining element 23 configured to cooperate with the insertion body 24, namely with the male component, so as to retain the latter inside the hole 22, namely inside the female component. The retaining element 23 is therefore configured to fix or engage the support portion 122 and the cover portion 121 together selectively, namely as required.

[0062] Preferably, in order to ensure a greater stability during engagement, one of the support portion 122 and the cover portion 121 includes a plurality of holes 22, namely a plurality of female components or elements, and the other one of the support portion 122 and the cover portion 121 includes a plurality of insertion bodies 24 or keys, namely a plurality of male components or elements designed to be inserted inside the hole 22.

[0063] In other words, the engaging and locking system 20 comprises a plurality of holes 22 and the plurality of insertion bodies 24 or keys, which can be joined to each other or together. Each of the plurality of holes 22 and the plurality of insertion bodies 24 or keys is provided on one of the connecting surfaces 121b, 122b of the support portion 121 and the cover portion 122.

[0064] According to a preferred aspect, each hole 22 and each insertion body 24 are configured to form a bayonet-type connection or a snap-engaging connection or a friction joint. In other words, the engaging and locking system 20 may be of the bayonet or snap-engaging or friction type.

[0065] According to a preferred aspect of the present disclosure, the engaging and locking system 20 comprises a fixed part and a movable part which is inserted into and moved with respect to the fixed part.

[0066] Preferably, the support portion 121 includes the fixed part of the engaging and locking system 20, while the cover portion 122 includes the movable part of the

engaging and locking system 20. This means that the cover portion 122 is configured to be gripped and handled by a user in order to fix it by means of insertion and movement within the support portion 121.

[0067] In particular, the support portion 121 includes at least one hole 22 and the cover portion 122 includes at least one insertion body 24 or key designed to be inserted inside the hole 22. Preferably, the support portion 121 includes a plurality of holes 22 and the cover portion 121 includes a plurality of insertion bodies 24 or keys.

[0068] Each insertion body 24 or key forms or corresponds to the movable part of the engaging and locking system 20. Each hole 22 instead forms or corresponds to the fixed part. It is also possible for the hole 22 to form the movable part and for the insertion body 24 to form the fixed part of the engaging and locking system 20. In other words, the kinematically reverse - or dual - solution is a possible alternative.

[0069] According to a preferred aspect of the present disclosure, each insertion body 24 is configured as a mushroom-like body, i.e. is essentially mushroom-shaped. In particular, the insertion body 24 includes a cylindrical portion 25 and a head portion 26 which extends radially from the cylindrical portion 25. The cylindrical portion 25 projects from the connecting surface of one of the support portion 121 and the cover portion 122. Preferably, the cylindrical portion 25 extends along a direction of extension I substantially orthogonal to the connecting surface of the portion of the sliding member 12 from which it is projects. Since the insertion body is mushroom-shaped, the head portion 26 has a first diameter D1 and the cylindrical portion 25 has a second diameter D2, smaller than the first diameter D1.

[0070] According to a preferred aspect of the present disclosure, each hole 22 is circumscribed or surrounded by one or more walls of the sliding member portion 12 in which it is formed. These one or more walls define therefore the perimeter or border of the hole 22.

[0071] According to a preferred aspect of the present disclosure, each hole 22 includes a first region 22', a second region 22" and a third region 22'" communicating with each other. i.e. connected together. In particular, the second region 22" is interposed between the first region 22' and the third region 22'" . In other words, the first region 22' and the third region 22'" communicate with each other, i.e. are connected together, by means of the second region 22" .

[0072] The first region 22' is configured to allow the introduction, or engagement, of the insertion body 24 and the extraction, or disengagement, of the insertion body 24. The first region 22' is configured, namely, to be crossed by the head portion 26 and by the cylindrical portion of the insertion body 24. Therefore, the first region 22' has a breadth greater than the first diameter D1.

[0073] The second region 22" is configured to allow the sliding, namely the displacement, within it, of the cylindrical portion 25 along a sliding direction S. Preferably the second region 22" extends mainly along the sliding

direction S. Namely, the second region 22" has a main dimension in the sliding direction S. The second region 22" is moreover, configured to prevent the head portion 26 from moving away along a direction orthogonal to the sliding direction S. In particular, the second region 22" has a secondary dimension which is smaller than the diameter of the head portion, namely the aforementioned first diameter D1. Preferably, this secondary dimension is slightly bigger than that of the second diameter D2, so as to avoid play between the second region 22" and the cylindrical portion. Even more preferably, the secondary dimension is such that the walls of the portion of the sliding member 12 in the second region 22" of the hole 22 are designed to be placed in contact with the cylindrical portion during the sliding movement of the insertion body 24.

[0074] Preferably, the sliding direction S is substantially orthogonal to the direction of extension I of the cylindrical portion 25. In other words, the sliding direction S is essentially one of the main directions of extension of the connecting surface in which the hole 22 is formed.

[0075] Consequently, the hole 22 is configured so that the insertion body 24, once inserted inside the first region 22', may be slid inside the second region 22" and may not be pulled out or extracted through the second region 22". In order to be able to be pulled out or extracted, the insertion body 24 must be positioned in the first region 22'.

[0076] The third region 22" is configured to accommodate the cylindrical portion 25 and, like the second region 22", to prevent the head portion 26 from being moved away along the direction orthogonal to the sliding direction S. The third region 22" is configured to receive and lock the insertion body 24. In particular, since it is arranged downstream in the direction of sliding S of the second region 22", the third region 22" constitutes an end-of-travel region for the insertion body 24. In other words, once the insertion body 24 is slid as far as the third region 22", it may not be moved further forwards along the sliding direction S. From the third region 22" the insertion body 24 may only be moved backwards towards the second region 22". In other words, from the third region 22", the insertion body may be slid only in a direction opposite to the sliding direction S towards the second region 22" and the first region 22'.

[0077] According to this same preferred aspect of the present disclosure, the portion of the sliding member 21 including the hole 22 further comprises at least one retaining tooth 23 which projects or protrudes inside the hole 22 straddling, or on the border between, the second region 22" and the third region 22". The third region 22" of the hole 22 and this retaining tooth 23 therefore define or form a retaining seat for the insertion body 24.

[0078] The retaining tooth 23 is configured to allow the insertion body 24 to slide or pass from the second region 22" to the third region 22" of the hole 22 and to prevent the insertion body 24 from sliding, being retracted or passing from the third region 22" to the second region

22" of the hole 22. In particular, the retaining tooth 23 is configured to cooperate or to interact with the cylindrical portion 25 of the insertion body 24. In other words, the retaining tooth 23 is configured to oppose the extraction of the insertion body 24, in particular the cylindrical portion 25, from the third region 22", along a direction opposite to the sliding direction S. Preferably, the retaining tooth 23 may be configured to be elastically deformed along the sliding direction S so as to allow the entry of the insertion body 24 into the third region 22" or to interfere with the cylindrical portion 25 if, during use, the insertion body 24 is stressed by an extraction force, namely a force in the opposite direction to the sliding direction S. In this way the insertion body 24, in particular the cylindrical portion 25, may be received inside the third region 22", while during use the extraction of the insertion body 24, in particular of the cylindrical portion 35, from the third region 22" is opposed. As a result, during use, the cylindrical portion 25 may be retained inside the third region 22" by the retaining tooth 23. The expression "during use" is understood as meaning during the motorcycling activity of the protection device 10, 11. During this activity, a special separating force or stress is not specifically applied to the protection device.

[0079] The retaining tooth 23 extends, preferably, along an engaging direction A orthogonal to the sliding direction S. Therefore, the engaging direction A coincides with or corresponds essentially to one of the main directions of extension of the connecting surface in which the hole 22 is formed.

[0080] Preferably, the retaining tooth 23 is elastically deformable. Even more preferably, the retaining tooth 23 is configured to be elastically deformed to a greater degree if it is subject to a stress or force in the sliding direction S, namely an engaging force or stress, compared to a stress or force acting in the direction opposite to the sliding direction S, i.e. a separating stress or force. In other words, in order to deform the retaining tooth 23 it is necessary to apply a stress in a direction opposite to the sliding direction which is greater than the stress applied in the sliding direction S. Therefore, this separating force or stress must be greater than the engaging force or stress in order to overcome the resistance of the retaining tooth 23.

[0081] Preferably, this retaining tooth 23 is a first tooth and the portion of the sliding member 21 including the hole 22 comprises in addition a second retaining tooth 27 which is structurally similar or identical to the first retaining tooth 23. The second retaining tooth 27 also projects or protrudes inside the hole 22, is positioned or arranged straddling, or on the border between, the second region 22" and the third region 22" and faces, namely is positioned opposite, the first retaining tooth 23.

[0082] The engaging or locking system 20 described in the present disclosure has the advantage of ensuring stable fixing and at the same time does not occupy extra space of the sliding member or slider 12. Therefore, the sliding member or slider 12 need not be designed with

overly large dimensions in order to ensure suitable protection for the user. As a result, the weight of the sliding member or slider 12 may therefore be advantageously limited.

[0083] The subject-matter of the present disclosure has been described hitherto with reference to embodiments thereof. It is to be understood that other embodiments relating to the same inventive idea may exist, all of these falling within the scope of protection of the claims which are attached below.

Claims

1. Sliding member or slider (12) intended to be associated with a protective garment, said sliding member or slider (12) having

a cover portion (121), intended during use to come into contact with a road surface and to assist sliding along the road surface and protect the protective garment from abrasion, and a support portion (122), associated with said cover portion (121) and intended to face said protective garment and to support said cover portion (121), wherein said support portion (122) has a plurality of lightening cavities (123).

2. Sliding member or slider (12) according to claim 1, wherein said support portion (122) has a reticular structure, defining the plurality of lightening cavities (123).

3. Sliding member or slider (12) according to claim 1 or 2, wherein, in the support portion, the plurality of lightening cavities (123) alternate with a plurality of partitions or separating walls

4. Sliding member or slider (12) according to claim 3, wherein the plurality of lightening cavities (123) occupies a volume or space greater than a space occupied by the separating walls or partitions of the support portion (122).

5. Sliding member or slider (12) according to any one of the preceding claims, wherein said lightening cavities (123) are distributed in a substantially homogeneous or uniform manner.

6. Sliding member or slider (12) according to any one of the preceding claims, wherein said cover portion (121) and said support portion (122) are configured to be joined together in a reversible manner.

7. Sliding member or slider (12) according to claim 6, wherein said cover portion (121) and said support portion (122) are provided with a reversible engaging

and locking system (20).

8. Sliding member or slider (12) according to claim 6 or 7, wherein one of said support portion (122) and said cover portion (121) includes at least one hole (22) and at least one retaining element (23) and the other one of said support portion (122) and said cover portion (121) includes at least one insertion body (24) or key designed to be inserted in the hole (22) and wherein said retaining element (23) is configured to cooperate with said insertion body (24) so as to retain said insertion body (24) inside said hole (22).

9. Sliding member or slider (12) according to claim 8, wherein said insertion body (24) includes a cylindrical portion (25) and a head portion (26) extending radially from said cylindrical portion (25).

10. Sliding member or slider (12) according to claim 9, wherein said hole (22) includes a first region (22'), a second region (22'') and a third region (22''') communicating with each other where:

- said first region (22') is configured to allow the insertion and extraction of said insertion body (24);
- said second region (22'') is configured to allow the cylindrical portion (25) to slide therein along a sliding direction (S) and to prevent said head portion (26) from moving away along a direction orthogonal to said sliding direction (S);
- said third region (22''') is configured to accommodate or receive said cylindrical portion (25) and to prevent said head portion (26) from moving away along a direction orthogonal to said sliding direction (S).

11. Sliding member or slider (12) according to one of the claims 8 to 10, wherein said retaining element is a retaining tooth (23) which projects or protrudes into said hole (22) and is arranged straddling, or on the border between, said second region (22'') and said third region (22'''); and wherein said retaining tooth (23) is configured to allow the sliding of said insertion body (24) from said second region (22'') to said third region (22''') and to oppose the sliding of said insertion body (24) from said third region (22''') to said second region (22'').

12. Sliding member or slider (12) according to claim 11, wherein said retaining tooth (23) is elastically deformable.

13. Protective device (10, 11) comprising a base (13) configured to be fixed to a protective garment (1), and a sliding member or slider (12) according to any one of the preceding claims, wherein said support

portion (122) is interposed between said cover portion (121) and said base (13) and can be fixed to said base (13).

14. Protective garment (1), in particular for motorcycling activities, comprising a protective device (10, 11) according to claim 13, or a sliding member or slider according to any one of claims 1 to 12. 5
15. Use of a cover portion for a sliding member or slider (12) according to one of claims 1 to 12, wherein the cover portion (121) is replaced after wear with another cover portion (121). 10

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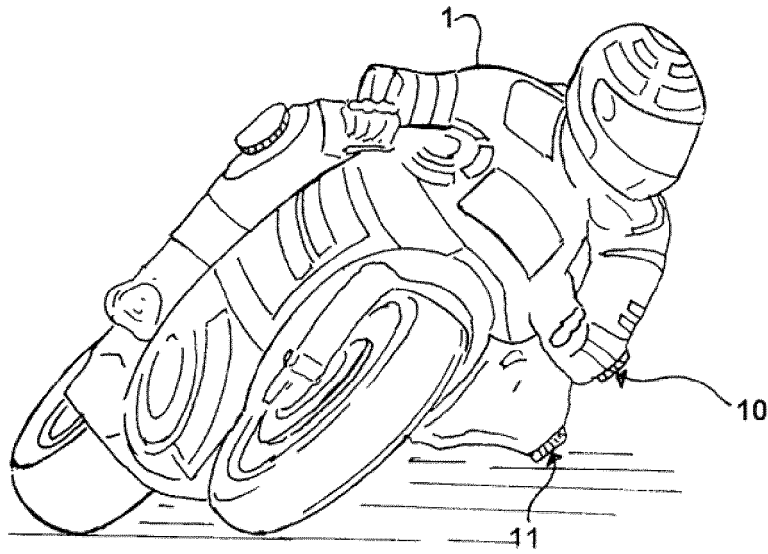


Fig. 1

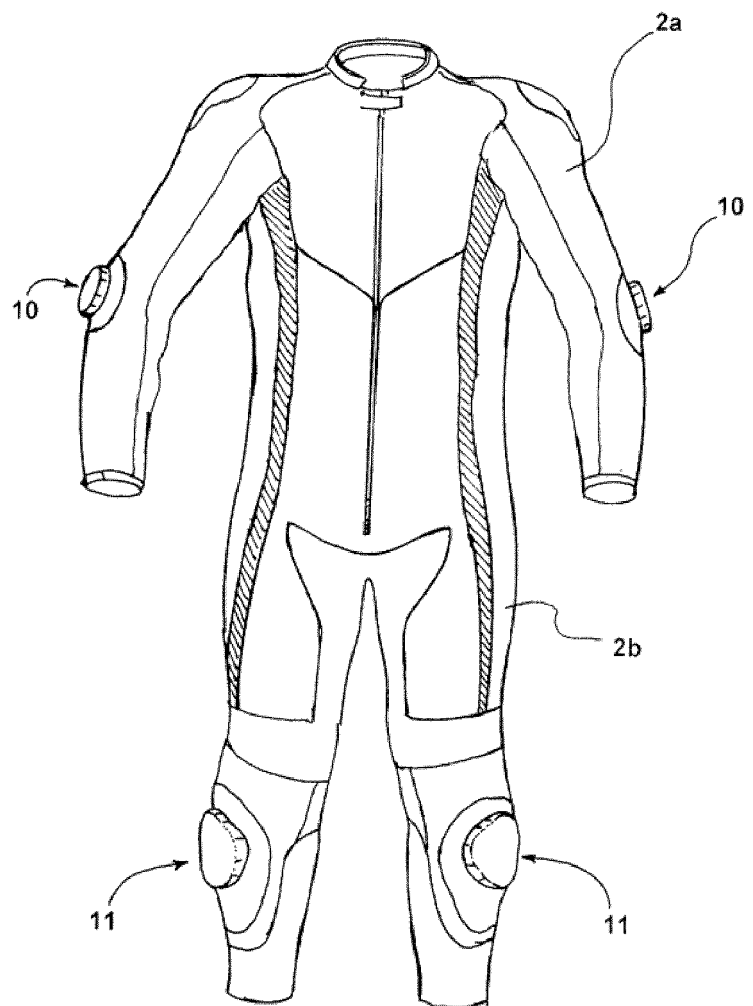


Fig. 2

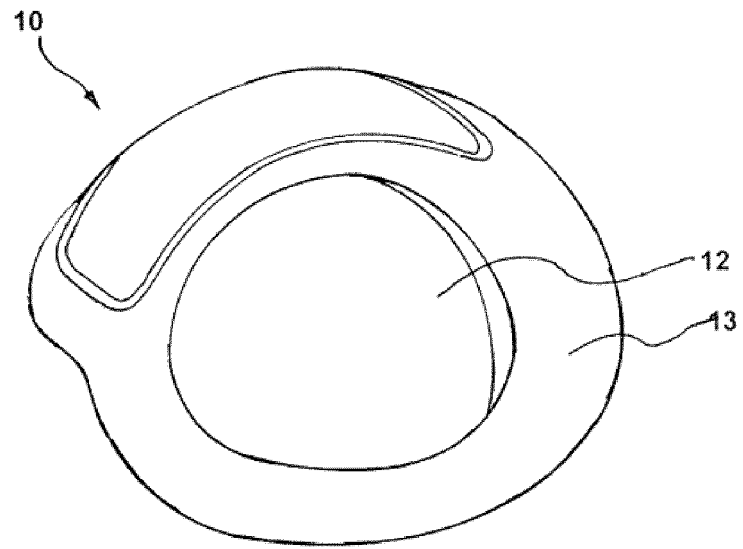


Fig. 3

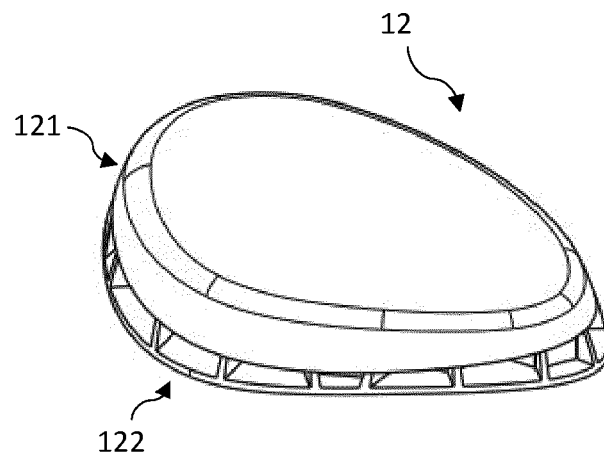


Fig. 4

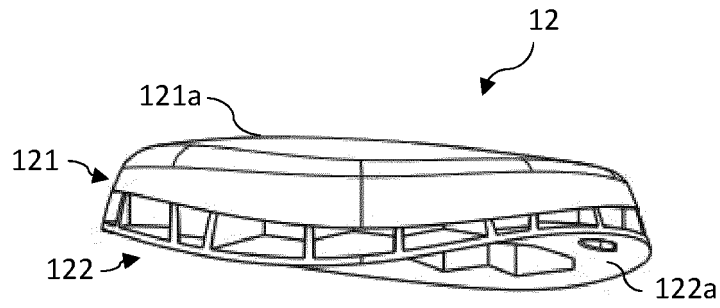


Fig. 5

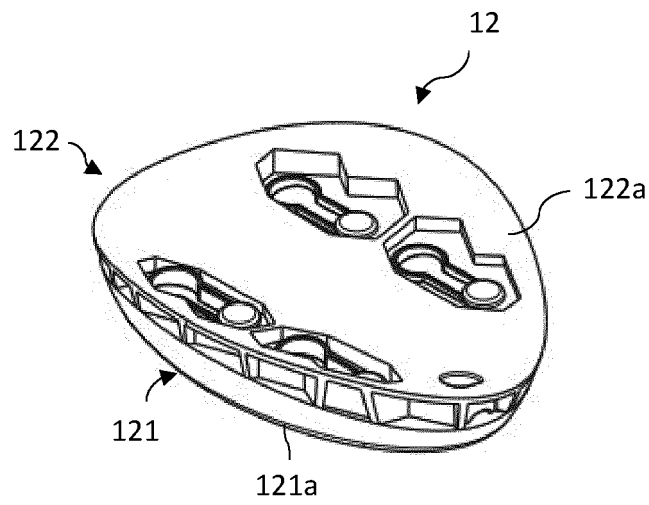


Fig. 6

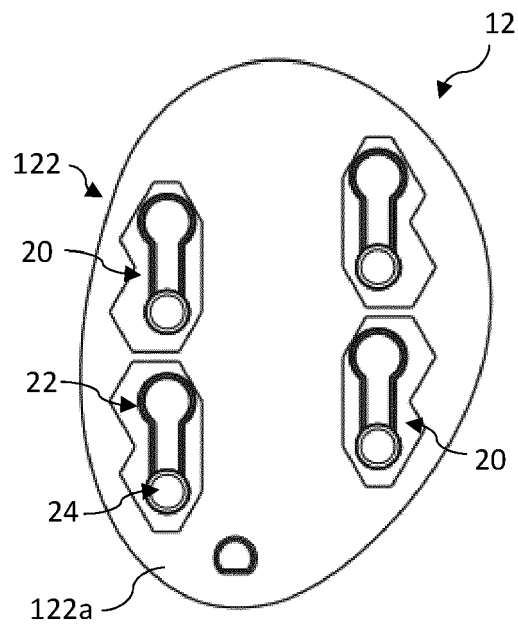
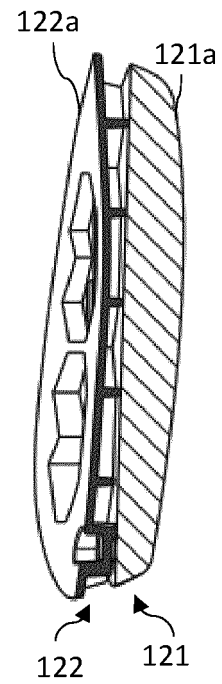
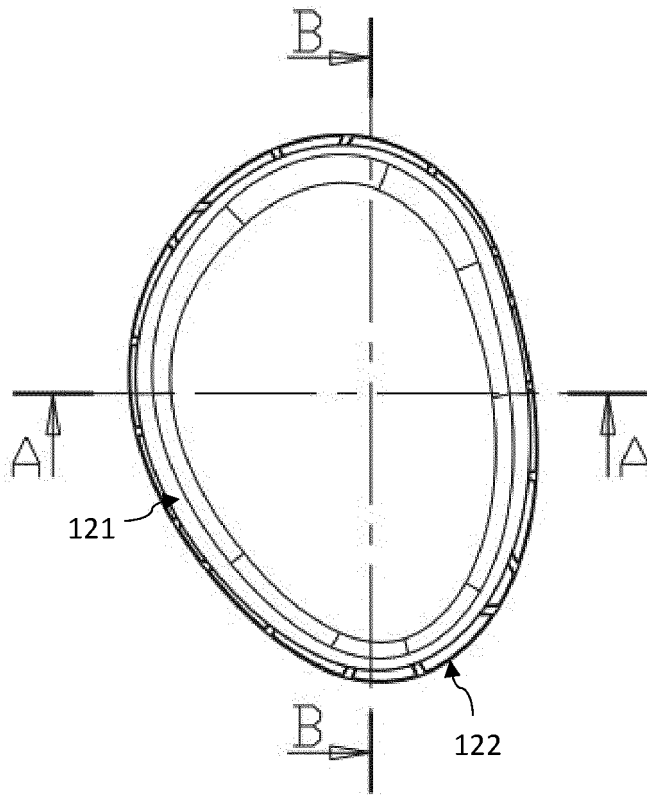
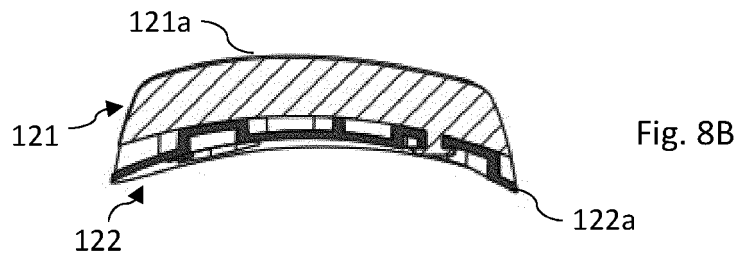
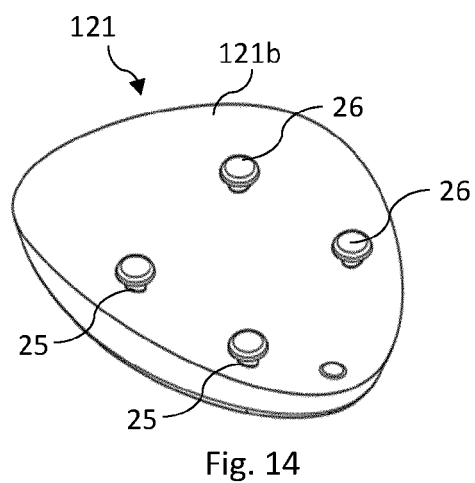
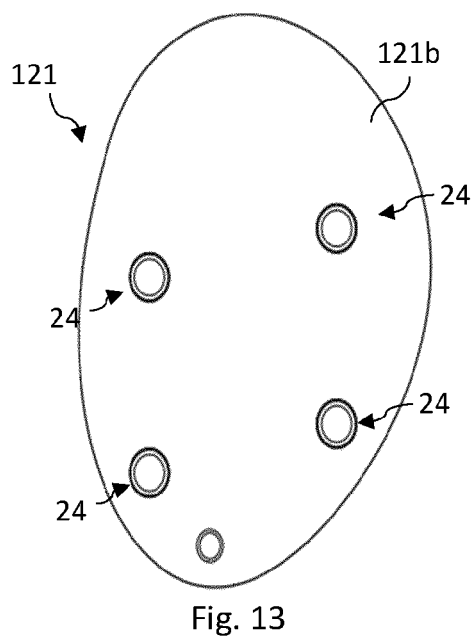
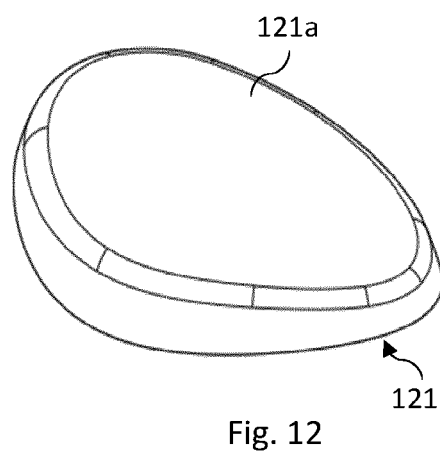
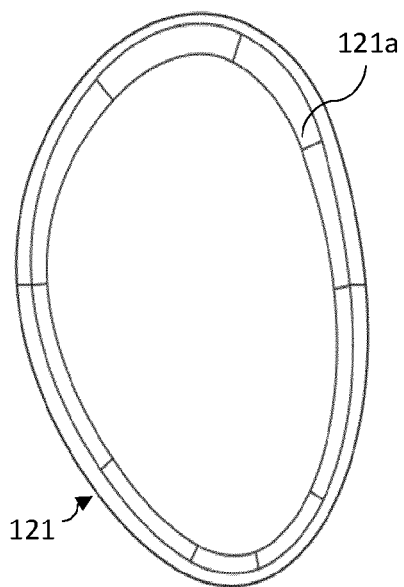
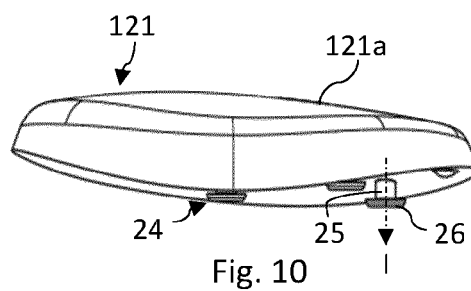
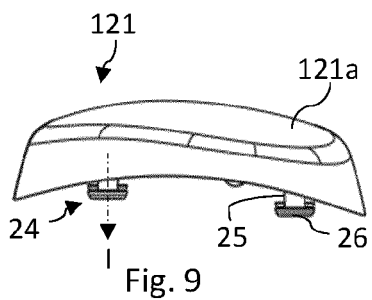


Fig. 7





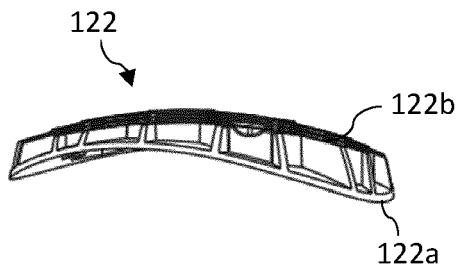


Fig. 15

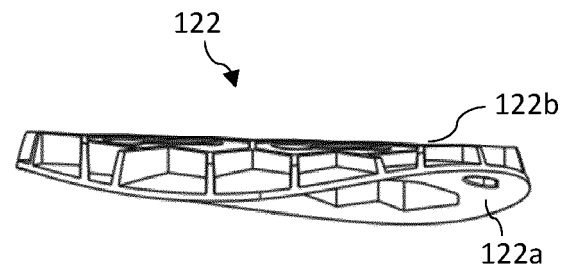


Fig. 16

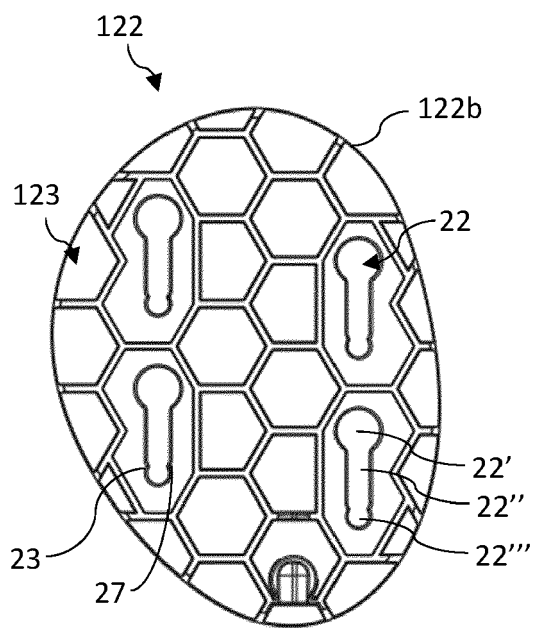


Fig. 17

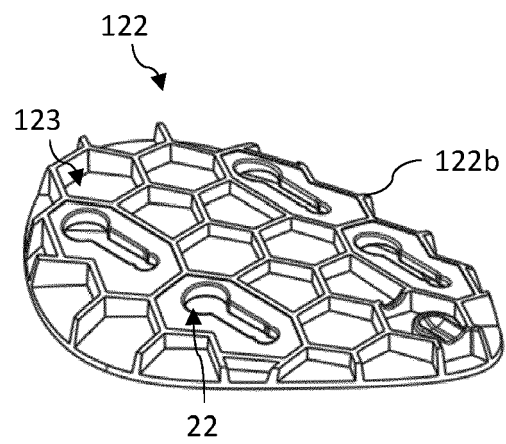


Fig. 18

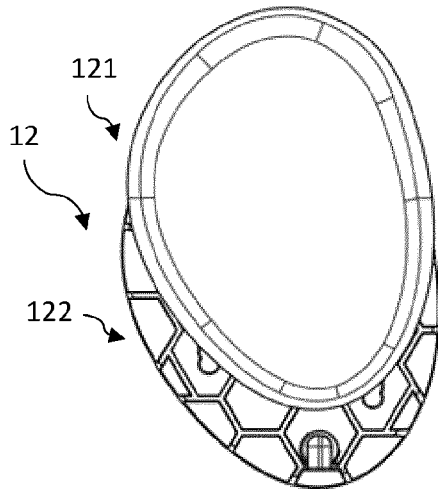


Fig. 19A

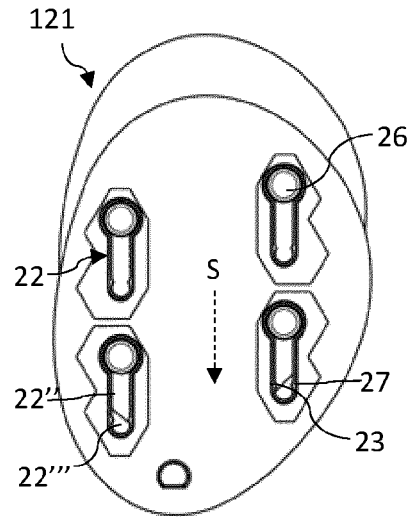


Fig. 19B

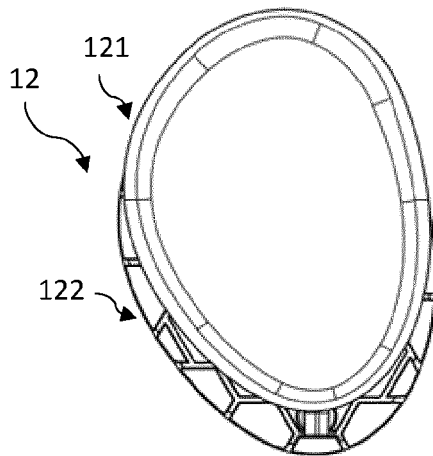


Fig. 20A

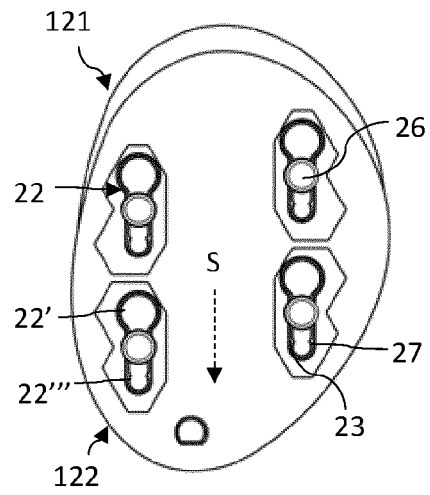


Fig. 20B

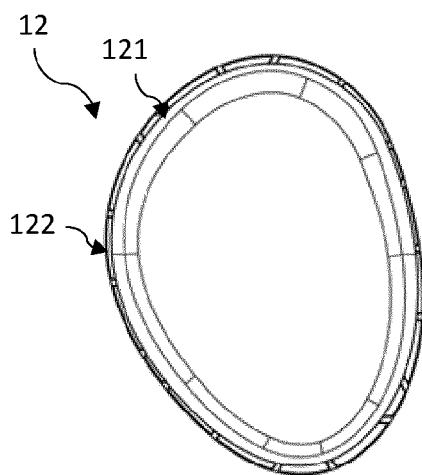


Fig. 21A

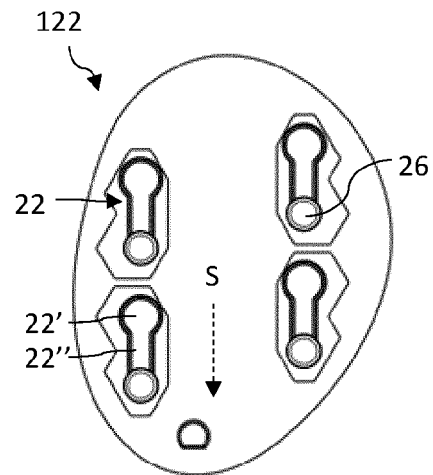


Fig. 21B



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Place of search The Hague		Date of completion of the search 6 May 2022	Examiner Krüger, Sophia
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