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(54) AERODYNAMIC ELEMENT FOR A GARMENT

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(56) References cited:
WO-A2-2007/116377
DE-A1-102012 214 061
DE-U1- 29 617 135
JP-U- H02 131 517

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Description

[0001] The present invention relates to an element for a garment, preferably one for sports, in particular for a suit or jacket for a motorcyclist, a cyclist, a skier or the like, to be applied in correspondence with the aerodynamic hump provided in said garment.

[0002] The idea of positioning a hump in the rear area of a motorcyclist garment, in particular of a motorcyclist suit, is known in order to allow the pilot, when assuming the "egg" shape, to obtain a more effective aerodynamic penetration in the area of the pilot's shoulders and back.

[0003] The use of the hump in a motorcyclist suit was born essentially for aerodynamic needs in order to connect the helmet with the suit in the area of the shoulder of the motorcyclist, even if over time other functions have been added to this function such as the containment function of components of the airbag (electronics, sensors, cylinder) and possibly moisturizing liquid for the pilot as well as the aesthetic function and/or advertising.

[0004] The fact that the main function of the hump is the aerodynamic one requires that, especially in the competitive field, each hump is tailored and/or mounted/positioned on the suit in a personalized way for each rider based on the needs and characteristics of both the rider (such as for example the size of the helmet, the driving position, etc.), that of the vehicle, as well as the corresponding aerodynamic tests made. This need for customization requires to modify/adapt the mold of each hump and/or to mount the hump on the suit in various positions, with a consequent increase in costs and above all in times which, in particular in a competitive context, are a critical factor.

[0005] Furthermore, from an aerodynamic point of view there is the need to reduce the distance between the back of the helmet D and the hump A as much as possible so as to ideally create a substantial continuity between them (see fig. 1). To this end, the idea of positioning in the rear area of the helmet an spoiler E having essentially aerodynamic function is already known and this in order to connect the profile of the helmet with that of the hump provided at the area of the shoulder of the motorcyclist. For example, DE29617135 describes an accessory to be mounted at the rear of a helmet, in particular a motorcycle helmet, which is defined by a concave-shaped body having a decreasing thickness from the center to the edge and ending at the edge of the helmet. Furthermore, DE102012214061 describes a helmet which has a tapered area at the rear with an aerodynamic function and an aerodynamic adjustment unit which is mounted on the helmet itself is also provided.

[0006] Currently, especially in the competitive field, to create a substantial continuity between the helmet D and the hump A, the latter is generally tailored and/or mounted/positioned on the suit in a personalized way for each pilot based on the needs and characteristics of both of the pilot himself - such as for example the size of the helmet D and of the possible conformation of the spoiler E of the latter (see fig. 2a and 2b), or the driving position assumed by the pilot himself while driving (cf. fig. 1) - and the vehicle, as well as of the corresponding aerodynamic tests made.

[0007] In particular, each hump A is tailored in a single piece which is inserted inside a special pocket obtained and positioned, always made to measure, in the garment. However, this solution is not fully satisfactory as it is particularly laborious to adapt and modify the molds of the standard shape and size humps so as to customize them according to the pilot and the vehicle. Furthermore, it is also particularly laborious to modify the mounting position of the hump on the garment, requiring for example to obtain a new pocket or to use a new garment.

[0008] On the other hand, a hump A with standard dimensions and conformation which is permanently mounted on the garment always and only in a single position - although it is potentially usable by several pilots and in combination with multiple types of helmets D and spoilers E (in particular in the face of the fact that, by not hindering the movements of the pilot's helmet from the rear, it can allow different driving positions) - it would not be optimized and personalized on the basis of the needs and characteristics of each pilot and would in particular entail an undesired increase in the distance between the helmet and the hump, thus creating turbulences that reduce the effectiveness of aerodynamic penetration.

[0009] WO2007/116377 describes a motorcycle suit comprising a hump-shaped rear aerodynamic appendage. In particular, this appendix is formed by a first portion which is permanently fixed externally to the suit and, within said first portion, a body which has a convex external surface is then removable. Furthermore, heat exchange means are housed inside said body, for example a Peltier cell, which are then connected with a plurality of peripheral cooling elements which are inserted in special pockets present on the motorcycle suit, and for this purpose to cool specific portions of the body of the motorcyclist wearing the suit. In this solution the entire hump - i.e. both the first portion and the body housing the heat exchange means - are fixed to the outer surface of the suit. Furthermore, the first portion is configured to mate with a single/single body of standard and predefined shape.

[0010] The object of the present invention is to propose an aerodynamic element for a garment, preferably sporty and in particular for a motorcycle suit, which eliminates the aforementioned drawbacks present in traditional solutions.

[0011] Another object of the invention is to propose an aerodynamic element which allows to customize and optimize in a simple, rapid and inexpensive way the aerodynamic profile of connection between the rear area of the helmet and the aerodynamic hump provided in the garment.

[0012] Another object of the invention is to propose an aerodynamic element that allows to customize and optimize in a simple, quick and inexpensive way the aerodynamic connection profile which, depending on the driving

position and helmet used by each pilot, is created between the rear area of the helmet and the aerodynamic hump provided in the garment.

[0013] Another object of the invention is to propose an aerodynamic element which, in particular in the context of sports competitions, allows to reduce costs and, above all, the times for the optimal development of the aerodynamic profile that is created in correspondence with the area defined between the helmet and hump provided in the garment.

[0014] Another object of the invention is to propose an aerodynamic element which allows the length and shape of the aerodynamic hump provided in the garment to be varied and customized in a simple, rapid and inexpensive way.

[0015] Another object of the invention is to propose an aerodynamic element which, particularly in the context of sports competitions, allows a rapid and immediate development of the aerodynamic profile conferred by a garment equipped with an aerodynamic hump.

[0016] Another object of the invention is to propose an aerodynamic element that allows to channel the air flows to thus increase both the aerodynamic efficiency and the ventilation of the garment.

[0017] Another object of the invention is to propose an aerodynamic element which allows to overcome the drawbacks deriving from the need to customize the aerodynamic hump provided in a sports garment.

[0018] Another object of the invention is to propose an aerodynamic element which is comfortable and quick to apply.

[0019] Another object of the invention is to propose an aerodynamic element which can be manufactured easily, quickly and with low costs.

[0020] Another object of the invention is to propose an aerodynamic element which can be produced, at least in part, in series and quickly and efficiently.

[0021] Another object of the invention is to propose an aerodynamic element which allows to obtain a pleasant overall aesthetic effect and which gives the observer the sensation of being faced with a high quality solution, both aesthetically and functionally.

[0022] Another object of the invention is to propose an aerodynamic element which results in high functional standards and at the same time in affordable cost, thus allowing the possibility of its diffusion on a large scale.

[0023] Another object of the invention is to propose an aerodynamic element which can also be proposed as an accessory of the garment, thus allowing a customization of the characteristics of the garment even in its large-scale distribution and in a non-competitive environment.

[0024] Another object of the invention is to propose an aerodynamic element which is improving and/or alternative with respect to traditional solutions.

[0025] Another object of the invention is to propose an aerodynamic element with an alternative characterization, both in functional and implementation terms, with respect to the traditional ones.

[0026] All these purposes, whether considered alone or in any combination thereof, and others which will result from the following description are achieved, according to the invention, with an aerodynamic element for a garment, preferably sporty and in particular for a motorcycle suit, having the characteristics indicated in claim 1, a garment having the characteristics indicated in claim 10, and a method having the characteristics indicated in claims 14 or 15.

[0027] The present invention is further clarified below in some of its preferred practical embodiments, shown purely by way of non-limiting example with reference to the attached drawings, in which:

Figure 1	shows a side view of a detail of a motorcyclist wearing a helmet equipped with a rear aerodynamic spoiler motorcycle clothing in which it is applied an aerodynamic hump according to the state of the art,
Figures 2a, 2b	show a side view of a detail of the motorcyclist's helmet, provided at the rear with an aerodynamic spoiler, and of the garment in which the aerodynamic hump of fig. 1 according to the state of the art is applied,
Figure 3	corresponds to fig. 1 with the air flows in correspondence of the helmet provided at the rear with an aerodynamic spoiler, and with the aerodynamic hump provided in the state of the art, are highlighted,
Figure 4	shows a partially exploded side view of a detail of a motorcyclist who wears a motorcycle garment in which an aerodynamic element according to the invention is used,
Figure 5	shows a side view of the detail of fig. 4 with the aerodynamic element according to the invention applied,
Figure 6	shows a side view of a detail of a motorcyclist wearing a motorcycle clothing in which the aerodynamic element according to the invention is used in one of its alternative embodiments,
Figure 7	shows an exploded perspective view of an aerodynamic element according to the invention to be applied to a hump,
Figure 8	shows in a perspective view the aerodynamic element applied to the hump,
Figure 9a	shows in a perspective view, again applied to a hump, a second embodiment of the aerodynamic element according to the invention,
Figure 9b	shows it in side section,
Figure 10	shows in perspective view, again applied to a hump, a third embodiment

of the aerodynamic element according to the invention.

[0028] As can be seen from the figures, the aerodynamic element 1 for a garment 3, preferably sporty, in particular for a suit or jacket for a motorcyclist, a cyclist, a skier or the like, comprises a body 6, which can be associated in a removable and repositionable way to an aerodynamic hump 2 provided in said garment 3 and which is configured to optimize the aerodynamic profile at a zone 19 defined between said hump 2 and the rear area 9 of the helmet 8 (worn on the head by the person wearing the garment 3), preferably between the hump 2 and the rear wing 7 of the helmet 8.

[0029] In particular, the body 6 is configured and positioned with respect to the hump 2 so that, during the performance of the sports gesture by the subject wearing the garment, it defines an efficient aerodynamic profile at an area 19 defined between said hump 2 of said garment and the rear area 9 of the helmet 8 worn on the head by said subject,

[0030] More in detail, said body 6 is configured so that, during the performance of the sports gesture, or in any case during a moving/running activity, by the subject wearing said garment 3 (for example during the driving position assumed by a motorcyclist, preferably when assuming the "egg" shape), optimizes the aerodynamic profile, preferably defining a substantial aerodynamic continuity, in correspondence with the area 19 defined between said hump 2 of said garment 3 and the rear area 9 of the helmet 8 worn on the head from that subject.

[0031] In particular, the rear area 9 of the helmet 8 means that area which - once said helmet is worn - covers the occipital portion and, at least partially, the parietal portion of the skull.

[0032] Suitably, according to the language of the prior art, "hump" 2 means the swelling or in any case the deformed portion which protrudes with respect to the remaining rear and upper part of a garment 3, and in particular of a motorcycle suit, and more specifically it is positioned in the rear area of the garment 3 which - once it is worn - covers the upper part of the back up to the area between the rider's shoulders. In particular, the hump 2 is suitable to be applied in a garment, for example a suit or a jacket, which is worn over any other garments (for example an undergarment) and above which no further garments are worn anyway. In essence, the aerodynamic hump 2 is suitable to be applied to the outermost garment which is intended to be worn by a subject, in particular for carrying out a sporting gesture or in any case a moving/running activity.

[0033] Conveniently, the garment 3 comprises a portion 10 with a substantially laminar development which is positioned externally and covers the upper hump 2. Preferably, the portion 10 of the garment 3 can be made entirely or in part of elastic material.

[0034] Suitably, the portion 10 has a substantially laminar development and is positioned externally and above with respect to the underlying hump 2. In particular, the portion 10 with a substantially laminar development comprises a portion of an article, preferably of leather (natural and/or synthetic) and/or fabric (i.e. obtained by weaving threads) and/or non-woven fabric, and/or in similar materials, with an extension of the thickness which is much less than that of the other two dimensions (length and width). In particular, the portion 10 with a substantially laminar development comprises a first surface which faces inwardly and towards the underlying hump 2, and a second surface which faces outwardly and towards the body 6.

[0035] Preferably, the hump 2 is a traditional aerodynamic hump provided in traditional motorcycle clothing. Advantageously, the hump 2 can be of the type described in the Italian patent application No. 102019000003315, the content of which is understood here to be fully referred to and incorporated by reference, and/or in the European patent application no. EP20161637.2, the content of which is intended here entirely referred to and incorporated by reference.

[0036] In particular, the body 6 of the element 1 is associated in a repositionable way in correspondence with the frontal area 17 of the hump 2 which is closest to the helmet 8 so as to protrude from the hump 2 in the direction of the helmet 8, so as to reduce at the zone 19 the distance that separates the helmet itself from the body 6.

[0037] Conveniently, the body 6 of the element 1 can be removably associated with the hump 2 below or above the layer of the garment 3. Advantageously, the body 6 can be constrained mechanically to the hump 2.

[0038] Conveniently, in the embodiment of fig. 6, the body 6 is positioned below the portion 10 of the garment 3 and can be constrained and/or in contact with the body (or bodies) that define the hump 2. Preferably, the body 6 is inserted into the same pocket, obtained in garment 3, in which the hump 2 is inserted. Conveniently, in this case, the pocket is provided with non-permanent closing means (for example defined by a zip) to allow, if necessary, access to said pocket to replace the body 6. Preferably, in this embodiment, the portion of the garment 3, below which the body 6 is positioned, is made entirely or in part of elastic material so as to be able to position, below said portion, bodies 6 of different shapes and sizes, thus allowing a prompt and rapid customization of the body itself in order to optimize the aerodynamic profile in correspondence with the zone 19.

[0039] Conveniently, the body 6 of the element 1 is shaped and applied to the hump 2 so as to make substantially continuous/linear the aerodynamic profile which from helmet 8 continues towards the hump itself. Advantageously, this allows to reduce the extent of the turbulences that are generated when the front air flow that follows the profile of the helmet 8 is inserted within the space of the area 19 defined between said helmet and the body 6.

[0040] Advantageously, the body 6 of the element 1 has a conformation suitable for joining and substantially

prolonging the profile of the hump 2 (see fig. 8).

[0041] Preferably, the body 6 of the element 1 can have a substantially laminar shape, preferably curved so as to join and substantially prolong the profile of the hump 2 (see fig. 8). Conveniently, the body 6 can have a substantially curved laminar shape at the lateral ends so as to follow the profile of the hump 2. Conveniently, the body 6 of the element 1 can have a curved shape with a concavity facing the hump 2. Conveniently, the body 6 of the element 1 can have a front portion 25 of substantially rounded shape and profile.

[0042] Advantageously, the body 6 of the element 1 can have a substantially tapered shape, so as to optimize its aerodynamic profile.

[0043] Advantageously, the front portion 25 of the body 6 (i.e. the portion facing the helmet 8) is shaped to adapt to the profile of the helmet itself.

[0044] Preferably, the front portion 25 of the body 6 can be configured so that - during the performance of the sports gesture, or in any case during a moving/running activity, by the subject wearing said garment (for example during the driving position assumed by a motorcyclist - interacts from the aerodynamic point of view with the rear area 9 and/or with the possible wing of the helmet 8.

[0045] In any case, advantageously, the body 6 of the element 1 has an easily customizable shape and size, to be easily and suitably adapted to the different needs of different users (i.e. wearers and, in particular, pilots). In particular, this means that bodies 6 of different shapes and sizes can be made, which can be associated with the same hump 2 or different humps. Advantageously, for this purpose, a plurality of molds can be provided and/or various processing methods/techniques can be used (for example cutting out, finishing or smoothing the body 6) and this in order to make bodies 6 of different configurations in terms of shape and/or dimensions.

[0046] Advantageously, the body 6 of the element 1 can be made by thermoforming, in particular starting from a flat plate, or it can be obtained by injection molding. Preferably, the body 6 can be made by thermoforming starting from a flat sheet of expanded material, in particular polyurethane. Suitably, the body 6 can be obtained by injection molding using simplified molds; moreover, in this case, by using foam material (for example polyurethane), the molds can be made of aluminum, thus obtaining an important cost reduction.

[0047] Suitably, in particular, the body 6 of the element 1 can be customized for each pilot based on the characteristics of the pilot himself, on the basis of the characteristics of the vehicle, of the aerodynamic tests made, as well as on the basis of the characteristics of the track and/or race. In particular, this means that elements 1 with bodies 6 of different shapes and sizes can be made, which can be associated (at different times and separately to each other) to the same hump 2, and this in order to modify/adapt the aerodynamic profile in correspondence with the zone 19 defined between the hump 2 and the rear zone of the helmet. Conveniently, for this purpose, a plurality of molds can be provided, each of which is intended to be used to create a corresponding configuration (in terms of shape and/or size) of said body 6, and therefore corresponding elements 1.

[0048] Suitably, the body 6 of the element 1 can be associated with the hump 2 in a removable and repositionable way by means of mechanical fixing means 12. Preferably, said mechanical fixing means 12 comprise mechanical coupling means, preferably by interlocking, by hooking or by using suitable fixing elements/members.

[0049] Suitably, the body 6 comprises:

- a plurality of through openings 14 intended to be crossed by fixing means 12 to constrain said body 6 to said hump 2, said through openings 14 being shaped and/or arranged so as to allow to adjust and/or modify the position and/or the inclination of said body 6 with respect to said hump 2, and/or
- a plurality of fixing means 12 integrated and/or integral with said body 6 and intended to cooperate with corresponding shaped holes 13 formed in said hump 2, said shaped holes 13 being shaped and/or arranged so as to allow adjustment and/or modifying the position and/or inclination of said body 6 with respect to said hump 2.

[0050] Advantageously, the body 6 of the element 1 is positioned above and externally with respect to the portion 10 with a substantially laminar development of the garment 3. Conveniently, the body 6 of the element 1 can be associated with the hump 2 by means of fixing means which cross the portion 10 with a substantially laminar development. Suitably, in the portion 10 with a substantially laminar development, corresponding through holes can be obtained to allow the passage of the fixing means to thus allow the body 6 to be constrained to the hump 2. Conveniently, the portion 10 with a substantially laminar development can be devoid of predefined through openings, which are instead obtained from the same fixing means as they pass through said portion 10 in front of their application in order to constrain the body 6 to the hump 2.

[0051] Suitably, the fixing means can be integrated and be part of the body 6 of the element 1 and/or of the hump 2, and/or comprise separate elements/organs which engage directly within the body 6 and/or the hump 2, and/or comprise separate elements which engages with corresponding counter-elements fixed/inserted or integral with the body 6 and/or the hump 2.

[0052] Preferably, the portion 10 with a substantially laminar development is fully between the body 6 and the hump 2. Basically, the substantially laminar portion 10 is sandwiched between the body 6 of the element 1 and the hump 2, which are constrained to each other by means of the fixing means.

[0053] For example, the body 6 of the element 1 can be fixed to the hump 2 by means of suitable members (for example screws) which pass through a portion 10

with a substantially laminar development, comprising for example at least one fabric layer of the garment 3. Conveniently, this allows a simple and quick release of the body 6 of the element 1 from the underlying hump 2, to then replace it with a different body 6 of another element to be then always tied to the same hump 2, thus avoiding having to replace the entire garment. Preferably, said fixing means 12 can comprise a plurality of screws or rivets (or in general protruding pins or pegs) which pass through openings 14 made in the body 6 to engage in corresponding holes 13 present/made in the hump 2. Advantageously, the through openings 14 are shaped and/or arranged so as to allow to adjust and/or modify the position and/or inclination of said body 6 with respect to said hump 2.

[0054] Advantageously, for example, the through openings 14 positioned on the sides of the body 6 can be inclined with respect to the direction defined by the X axis, so that a translation along the X axis also corresponds to a translation along the Y axis. Conveniently, in this way, the same body 6 can be associated with the hump 2 in so that it can be repositioned with respect to the latter, that is, so that it can change/adjust its position and/or inclination.

[0055] Conveniently, in a further variant not shown, the fixing means (defined for example by protruding pins, screws and/or rivets) are integrated/incorporated and/or integral with the body 6 and engage within corresponding shaped holes 13 present/obtained in the hump 2. Conveniently, in this case, the shaped holes 13 of the hump 2 are shaped and/or arranged so as to allow to adjust and/or modify the position and/or inclination of said body 6 with respect to said hump 2.

[0056] Conveniently, in a further variant not shown, the fixing means (defined for example by protruding pins, screws and/or rivets) are integrated/incorporated and/or integral with the hump 2 and engage within corresponding openings present/obtained in the body 6 Conveniently, in this case, the openings of the body 6 are shaped and/or arranged so as to allow to adjust and/or modify the position and/or inclination of said body 6 with respect to said hump 2.

[0057] Advantageously, as said and as is represented for example in figures 4 and 5, the body 6 of the element 1 can be positioned above the portion 10 of the motorcycle garment 3 (i.e. on the surface of the latter facing outwards), while the hump 2 is positioned below the same portion 10. In particular, in this case, the body 6 of the element 1 is associated with the hump 2 at a portion 10 which covers/coats the latter and can be mechanically fixed to the hump 2 and/or to said portion 10 of the garment 3.

[0058] Advantageously, in addition to the fixing means that connect the body 6 to the hump 2, said covering body 6 can also be fixed directly to the (only) portion 10 with a substantially laminar development by stitching or by means of traditional quick coupling means, preferably by means of clips, rivets, buttons (for example mushroom), velcro, zip, etc. Conveniently, the quick coupling means can be mounted on portion 10.

[0059] Advantageously, the aforesaid portion 10 of the garment 3, in correspondence with which the element 1 is applied, can comprise one or more layers, preferably made of natural or synthetic leather, or in fabric or other suitable coating used to make garments for motorcyclist. Advantageously, the body 6 of the element 1 can be moved in translation and/or inclined with respect to the hump 2 along a first direction X (corresponding substantially to the longitudinal development of said hump) and/or along a direction Y (corresponding substantially to a direction perpendicular - i.e. approaching/moving away - with respect to the external surface of said hump) and/or along a Z direction (not shown, corresponding substantially to the transverse/lateral development of said hump itself).

[0060] Preferably, if the body 6 is associated with the hump 2 by means of screws or rivets 12, this movement is made possible thanks to the shape and arrangement of the openings 14 which, preferably, are defined by elongated slots, for example in the longitudinal direction along the X axis, so as to allow a fine adjustment both of the longitudinal position of the body 6 with respect to the hump 2, and of the inclination of said body towards/away from the underlying hump.

[0061] Suitably, the fact that the body 6 can be translated and/or inclined with respect to the hump 2 allows to quickly and easily adapt the configuration and positioning of the element 1 to the specific characteristics of each helmet 8 (and in particular of its rear wing 7) and the specific needs of each driver, which depend for example on his driving position, stature and build and other aspects. In particular, by suitably acting on the fixing means 12 it is possible to make an extremely precise adjustment of the position of the body 6 and, in this way, regardless of the characteristics of the pilot and his helmet 8, it is possible to reduce the distance between the latter and the hump 2 and thus obtain the most efficient aerodynamic profile in the area 19 defined between the helmet 8 and the hump 2, thus improving the overall aerodynamic effect according to the specific needs (both of the scope of application and of the individual pilot).

[0062] Basically, in this way, it is possible to customize the aerodynamic profile in the area 19 between the helmet 8 or the hump 2 without necessarily having to intervene on the entire hump 2 or on the helmet 8, also allowing to obtain an important reduction of the cost and the time of personalization.

[0063] The solution according to the present invention is particularly advantageous in that the customization of the hump is extremely easy and rapid since it is sufficient to select and apply the most suitable/appropriate body 6 above the hump 2, without thus having to intervene on the helmet 8 and/o modify or open the garment in the area, preferably shaped like a pocket, which covers or into which the body defining the hump 2 is inserted.

[0064] Conveniently, moreover, by using traditional

tools (for example a drill) on a body 6 having a certain configuration, it is possible to vary the shape, the arrangement and/or the number of the openings 14 formed therein, thus expanding the possibilities of adjusting the position of the body 6 with respect to the hump 2.

[0065] Advantageously, the configuration of the body 6 of the element 1, as well as its positioning with respect to hump 2, also allows modification of the longitudinal development of hump 2.

[0066] Advantageously, the configuration of the body 6 of the element 1, as well as its positioning with respect to the hump 2, also allows to modify the configuration - in terms of size and/or shape - of the front zone 17 of the hump 2. Preferably, the body 6 of the element 1 - in addition to defining a substantial aerodynamic continuity between said hump 2 and the rear area 9 of the motorcyclist's helmet 8 - is configured (i.e. it is shaped and sized) to cooperate with said hump in order to modify or improve the overall aerodynamic effect of the hump itself. Conveniently, in this case, the aerodynamic effect is defined by the profile, in terms of size and shape, of the outermost surface portion of the body 6 combined with the part of the hump 2 which is not covered by said body.

[0067] Advantageously, for example, in a second embodiment of the element 1 (see fig. 9a and 9b), the body 6 can have a front portion 25 (i.e. the one facing and closer to the helmet 8) which is curved, protruding and which preferably substantially covers, at least partially, the front area 17 (i.e. the one facing the helmet 8) of the hump 2. Advantageously, this allows to improve the continuity of the aerodynamic profile between the helmet 8 and the hump 2 and it also allows to modify the overall profile of the hump 2.

[0068] Advantageously, the front portion 25 can define a hollow seat 18 inside which - during the performance of the sports gesture (for example during the driving position assumed by a motorcyclist, preferably when it assumes the "egg" shape) or in any case during a moving/running activity - the helmet 8 worn by said motorcyclist can be housed, at least partially. Preferably, the hollow seat 18 has a conformation which, at least partially, is complementary to the rear portion 9 of the helmet 8. In particular, the hollow seat 18 can have a substantially semicircular development and is connected continuously to the front area 17 of the hump 2.

[0069] Advantageously , in a third embodiment (see fig. 10), the body 6 of the element 1 has air inlet passages 20 and air outlet passages 22.

[0070] Advantageously, the inlet passages 20 are defined in an area of the body 6 which is upstream with respect to the area of the latter in which the outlet passages 22 are defined. Preferably, the air inlet passages 20 are defined in correspondence of the front portion 25 of the body 6 (i.e. the one facing and closest to the helmet 8) so as to allow the air that impacts on the front part 16 of said body 6 to penetrate inside and below said body 6, and then coming out of the exit passages 22 present on the rear portion 26 of the body 6.

[0071] Advantageously, in addition to the exit openings 22 defined in the body 6, further passages obtained on the hump 2 can be provided to allow air to enter under the body 6 through the inlet passages 20, to also penetrate inside the hump 2. Conveniently, in this case, the hump can have corresponding passages for the escape of the air.

[0072] Advantageously, this allows to reduce the air pressure at the front portion 25 of the element 1 and also allows the extraction of hot air from the hump 2, thus cooling the pilot wearing the garment 3 provided with said hump.

[0073] Advantageously, in particular in said third embodiment (see fig. 10), the body 6 of the element 1 can have protruding tabs 24 which, in particular, protrude with respect to the external surface of the rear portion 26 of said body 6. Preferably, the protruding tabs 24 can be defined by sections cut and then folded of the body 6 which, in doing so, also define the exit passages 22.

[0074] The present invention also comprises a garment 3, preferably a jacket or suit for a motorcyclist, cyclist, skier or the like, which is provided with an aerodynamic element 1, such as the one described above, which is removably applied to the hump 2 integrated in said garment and positioned below a laminar covering portion 10. Preferably, the hump 2 is housed inside a pocket of the garment and, therefore, said portion 10 which is crossed by the fixing means - which constrain the body 6 of the element 1 to the underlying hump 2 - is defined by the outermost part that defines said pocket.

[0075] The present invention also includes a method for identifying and/or defining the aerodynamic hump for a sports garment, in particular for a suit or jacket for a motorcyclist, cyclist, skier or the like, which is optimized based on the needs and characteristics of the pilot/subject wearing this garment (such as the size of the helmet, the driving position, etc.) and/or that of the vehicle and/or the corresponding aerodynamic tests made. In particular, this method provides for

- starting from a garment having a standard aerodynamic hump or in any case not optimized/customized, and
- preparing at least one element 1 as described above or, preferably, preparing a plurality (at least two) elements 1 as described above having bodies 6 of different configuration (in terms of conformation and/or dimensions).

[0076] Suitably, using a single element 1, the method provides to associate in sequence different configurations of the body 6 of the same element 1 to a standard (i.e. not optimized/customized) aerodynamic hump and to adjust the position of said body 6 with respect to the latter until the position and configuration of the body 6 of the element 1 is identified, which allows to obtain the most efficient aerodynamic profile at the area 19 defined between the hump 2 and the rear area of the helmet.

[0077] In particular, once element 1 has been prepared and/or made, it is made available and, for each of the different configurations (in terms of conformation and/or dimensions) which - in sequence - are obtained/obtained for the body 6 of the same element 1, the following operations are carried out until the position and configuration of the body 6 of the element 1 is identified, which allows to obtain the most efficient aerodynamic profile at the zone 19 defined between the hump 2 and the rear area of the helmet:

- approaching and/or positioning the body 6 above the hump 2,
- constraining together the covering body 6, thus positioned and/or approached, and the hump 2,
- during the performance or simulation (for example through a wind tunnel) of a sporting gesture or in any case of a moving/running activity by the subject wearing the garment 3 equipped with said hump 2 to which the body was tied 6, the characteristics and/or the aerodynamic efficiency and/or the aerodynamic profile are identified/measured and/or assessed in the area 19 defined between the hump 2 and the rear area of the helmet and/or the hump in general.

[0078] Suitably, by using two or more elements 1, the method provides to associate in sequence the body 6 of each of said elements 1 to said standard aerodynamic hump (i.e. not optimized/customized) and to adjust the position of said body 6 with respect to the latter until the position and configuration of the body 6 of the element 1 is identified, which allows to obtain the most efficient aerodynamic profile in the area 19 defined between the hump 2 and the rear area of the helmet.

[0079] In particular, once two or more elements 1 have been prepared and/or made, each of which has a different configuration of the body 6 (in terms of conformation and/or dimensions), these elements are made available in sequence and, for each element 1, the following operations are carried out until the element 1 (and in particular the corresponding configuration of the body 6 of said element), and the position of said element are identified, which allow to obtain the most efficient aerodynamic profile at zone 19 defined between hump 2 and the rear area of the helmet:

- approaching and/or positioning the body 6 of an element 1 above the hump 2,
- constraining together the covering body 6 of the element 1, thus positioned and/or approached, and the hump 2,
- during the performance or simulation (for example through a wind tunnel) of a sporting gesture or in any case of a moving/running activity by the subject wearing the garment 3 equipped with said hump 2 to which the body was tied 6 of said element 1, the characteristics and/or the aerodynamic efficiency and/or the aerodynamic profile are detected/measured and/or assessed in the area 19 defined between the hump 2 and the rear area of the helmet and/or the hump in general.

[0080] The element 1 has been described mainly in its application in a motorcycle suit or jacket, however it is intended that it can also be applied in a garment usable in any area in which, during the performance of a certain gesture, the wearer moves at high speed in an open position, that is, in contact with the air it is passing through.

[0081] From what has been said it is clear that the aerodynamic element according to the invention is particularly advantageous since:

- allows to change quickly and precisely, and at low costs, both the distance between the helmet and the aerodynamic hump, and the size and shape of the hump itself, thus obtaining a high customization of the aerodynamic effect,
- it is of rapid, simple and economic construction,
- it is quick and easy to apply and replace in the garment, especially in the motorcycle suit, and
- allows a high and immediate customization both of its configuration (shape and/or dimensions) and of its position of installation/assembly on the hump of the garment.

Claims

1. Aerodynamic element (1) for a garment (3), preferably sporty, in particular for a suit or jacket for a motorcyclist, cyclist, skier or the like, comprising:

- a body (6) which is configured to be associated in a removable and repositionable manner with an aerodynamic hump (2), provided in said garment (3), and so that, during the performance of the sports gesture by the subject wearing said garment, defines an efficient aerodynamic profile in correspondence with an area (19) defined between said hump (2) of said garment and the rear area (9) of a helmet (8) worn on the head by said subject,

and **characterized in that** said body (6) comprises:

- a plurality of through openings (14) intended to be crossed by fixing means (12) to constrain said body (6) to said hump (2), said through openings (14) being shaped and/or arranged so as to allow to adjust and/or modify the position and/or inclination of said body (6) with respect to said hump (2), and/or
- a plurality of fixing means (12) integrated and/or integral with said body (6) and intended to cooperate with corresponding shaped holes

(13) formed in said hump (2), said shaped holes (13) being shaped and/or arranged so as to allow adjustment and/or modification of the position and/or inclination of said body (6) with respect to said hump (2).

2. Aerodynamic element according to claim 1, **characterized in that** said body (6) is configured so as to protrude from the hump (2) towards the helmet (8), so as to reduce the distance in correspondence with the zone (19) that separates the helmet itself from said body (6).

3. Aerodynamic element according to one or more of the preceding claims, **characterized by** the fact that the shape and/or size of said body (6), and/or its positioning with respect to said hump (2), modifies the aerodynamic profile of the hump itself, preferably at its front area (17).

4. Aerodynamic element according to one or more of the preceding claims, **characterized by** the fact that the shape and/or size of said body (6), and/or its positioning with respect to said hump (2), make the profile substantially continuous/linear aerodynamic that from the helmet (8) continues towards the hump itself.

5. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said fixing means (12) comprise elements/separate organs which engage directly within the body (6) and/or the hump (2), and/or they comprise separate elements which are engaged with corresponding counter-elements fixed/engaged or integral with the body (6) and/or the hump (2).

6. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said body (6) of the element (1) is positioned above and externally with respect to the portion (10) with a substantially laminar development of the garment (3) that covers said hump (2).

7. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said body (6) is configured to be positioned below and internally with respect to the portion (10) with a substantially laminar development of the garment (3) covering said hump (2) and to be bound and/or in contact with said hump (2).

8. Aerodynamic element according to one or more of the preceding claims, **characterized by** the fact that the body (6) of the element (1) has a substantially laminar and curved conformation to blend with continuity with the profile of said hump (2).

9. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said body (6) is made by thermoforming, in particular starting from a flat sheet, or is produced by injection molding.

10. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said body (6) comprises a front portion (25) configured in such a way that - during the sporting gesture by the person wearing said garment, for example when a motorcyclist assumes the driving position - interacts from the aerodynamic point of view with the rear area (9) and/or with the possible wing (7) of the helmet (8).

11. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said body (6) comprises inlet passages (20) and air outlet passages (22) of the air.

12. Aerodynamic element according to one or more of the preceding claims, **characterized in that** said at least one body (6) is also fastened removably and directly to said portion (10) with a substantially laminar development that covers externally and superiorly said hump (2), preferably by means of quick coupling and/or stitching.

13. Sportswear (3), preferably sportswear, in particular a biker, cyclist, skier or similar suit or jacket, **characterized in that** it comprises, in correspondence with the rear area of the garment which - when worn - covers the upper part of the back up to the area between the shoulders of the person wearing it, an aerodynamic hump (2) with an element (1) according to one or more of the preceding claims which is removable and repositionable associated with said aerodynamic hump (2) so that, during the performance of the sports gesture by the subject wearing this garment, it defines an efficient aerodynamic profile in correspondence with an area (19) defined between said hump (2) of said garment and the rear area (9) of a helmet (8) worn on the head by said subject.

14. Method for identifying and/or defining the aerodynamic hump for a garment (3), preferably sporty, in particular for a suit or jacket for a motorcyclist, cyclist, skier or the like, which is optimized on the basis of the needs and characteristics of the pilot and/or that of the vehicle and/or the corresponding aerodynamic tests made, this method involves

- starting from a garment having an aerodynamic hump (2) that is standard and/or not optimized,
- preparing an element (1) according to one or more of the preceding claims, so that the body (6) of said element (1) assumes, in sequence

and distinct moments, at least two different configurations,
- associating each configuration of the body (6) of said element (1) in sequence to said standard and/or non-optimized aerodynamic hump (2) and adjusting the position of said body (6) with respect to said hump until the position is identified and the configuration of the body (6) of the element (1) which allows to obtain the most efficient aerodynamic profile in correspondence with the area (19) defined between the hump (2) and the rear area (9) of the helmet (8).

15. Method for identifying and/or defining the aerodynamic hump for a garment (3), preferably sporty, in particular for a suit or jacket for a motorcyclist, cyclist, skier or the like, which is optimized on the basis of the needs and characteristics of the pilot and/or that of the vehicle and/or the corresponding aerodynamic tests made, this method involving

- starting from a garment having an aerodynamic hump (2) that is standard and/or not optimized,
- preparing at least two elements (1) according to one or more of the preceding claims, the respective bodies (6) of said at least two elements (1) having different configurations between them,
- sequentially associating the body (6) of each of said elements (1) with said standard and/or non-optimized aerodynamic hump (2) and adjusting the position of said body (6) with respect to said hump until the position is identified and the element (1) which allows to obtain the most efficient aerodynamic profile in correspondence with the area (19) defined between the hump (2) and the rear area (9) of the helmet (8).

Patentansprüche

1. Aerodynamisches Element (1) für ein vorzugsweise sportliches Kleidungsstück (3), insbesondere für einen Anzug oder eine Jacke für einen Motorradfahrer, Radfahrer, Skifahrer oder dergleichen, umfassend:

- einen Körper (6), der so konfiguriert ist, dass er in abnehmbarer und neu positionierbarer Weise mit einem aerodynamischen Höcker (2) verbunden werden kann, der in dem Kleidungsstück (3) vorgesehen ist, und so, dass er während der Ausführung der sportlichen Betätigung durch die Person, die das Kleidungsstück trägt, ein effizientes aerodynamisches Profil in Übereinstimmung mit einem Bereich (19) definiert, der zwischen dem Höcker (2) des Kleidungsstücks und dem hinteren Bereich (9) eines Helms (8), der von der Person auf dem Kopf getragen wird, definiert ist,

und **dadurch gekennzeichnet, dass** der Körper (6) umfasst:

- eine Vielzahl von Durchgangsöffnungen (14), die dazu bestimmt sind, von Befestigungsmitteln (12) durchquert zu werden, um den Körper (6) an dem Höcker (2) festzuhalten, wobei die Durchgangsöffnungen (14) so geformt und/oder angeordnet sind, dass sie die Einstellung und/oder Änderung der Position und/oder Neigung des Körpers (6) in Bezug auf den Höcker (2) ermöglichen, und/oder
- eine Vielzahl von Befestigungsmitteln (12), die in den Körper (6) integriert und/oder einstückig mit ihm ausgebildet sind und dazu bestimmt sind, mit entsprechenden geformten Löchern (13) zusammenzuwirken, die in dem Höcker (2) ausgebildet sind, wobei die geformten Löcher (13) so geformt und/oder angeordnet sind, dass sie eine Einstellung und/oder Änderung der Position und/oder Neigung des Körpers (6) in Bezug auf den Höcker (2) ermöglichen.

2. Aerodynamisches Element nach Anspruch 1, **dadurch gekennzeichnet, dass** der Körper (6) so konfiguriert ist, dass er von dem Höcker (2) in Richtung des Helms (8) vorsteht, um den Abstand in Übereinstimmung mit der Zone (19) zu verringern, die den Helm von dem Körper (6) trennt.

3. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Form und/oder Größe des Körpers (6) und/oder seine Positionierung in Bezug auf den Höcker (2) das aerodynamische Profil des Höckers, vorzugsweise in seinem vorderen Bereich (17), verändert.

4. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Form und/oder die Größe des Körpers (6) und/oder seine Positionierung in Bezug auf den Höcker (2) ein im Wesentlichen kontinuierliches/lineares aerodynamisches Profil ergeben, das sich vom Helm (8) aus in Richtung des Höckers fortsetzt.

5. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Befestigungsmittel (12) Elemente/getrennte Organe umfassen, die direkt in den Körper (6) und/oder den Höcker (2) eingreifen, und/oder dass sie getrennte Elemente umfassen, die mit entsprechenden Gegenelementen in Eingriff stehen, die an dem Körper (6) und/oder dem Höcker (2) befestigt/eingesetzt oder einstückig damit aus-

gebildet sind.

6. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Körper (6) des Elements (1) oberhalb und außerhalb des Abschnitts (10) mit einer im Wesentlichen flächigen Entwicklung des Kleidungsstücks (3) angeordnet ist, der den Höcker (2) bedeckt.

7. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Körper (6) so konfiguriert ist, dass er unterhalb und innerhalb des Abschnitts (10) mit einer im Wesentlichen flächigen Entwicklung des Kleidungsstücks (3), der den Höcker (2) bedeckt, positioniert ist und mit dem Höcker (2) verbunden und/oder in Kontakt ist.

8. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Körper (6) des Elements (1) eine im Wesentlichen flächige und gekrümmte Form aufweist, um sich mit Kontinuität an das Profil des Höckers (2) anzupassen.

9. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Körper (6) durch Thermoformung, insbesondere ausgehend von einer flachen Platte, oder durch Spritzgießen hergestellt ist.

10. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Körper (6) einen vorderen Abschnitt (25) aufweist, der so konfiguriert ist, dass er - während der sportlichen Betätigung durch die Person, die das Kleidungsstück trägt, zum Beispiel wenn ein Motorradfahrer die Fahrposition einnimmt - aus aerodynamischer Sicht mit dem hinteren Bereich (9) und/oder mit dem möglichen Flügel (7) des Helms (8) zusammenwirkt.

11. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Körper (6) Einlasskanäle (20) und Luftauslasskanäle (22) für die Luft aufweist.

12. Aerodynamisches Element nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der mindestens eine Körper (6) auch abnehmbar und direkt an dem Abschnitt (10) mit einer im Wesentlichen flächigen Entwicklung befestigt ist, der den Höcker (2) außen und oben bedeckt, vorzugsweise mittels Schnellkupplung und/oder Nähten.

13. Sportbekleidung (3), vorzugsweise Sportbekleidung, insbesondere Biker-, Radfahrer-, Skifahrer- oder ähnliche Anzüge oder Jacken, **dadurch gekennzeichnet, dass** sie in Übereinstimmung mit dem hinteren Bereich des Kleidungsstücks, der - wenn sie getragen wird - den oberen Teil des Rückens bis zu dem Bereich zwischen den Schultern der Person, die sie trägt, bedeckt, einen aerodynamischen Höcker (2) mit einem Element (1) nach einem oder mehreren der vorstehenden Ansprüche umfasst, das abnehmbar und neu positionierbar ist und mit dem aerodynamischen Höcker (2) verbunden ist, so dass es während der Ausführung der sportlichen Betätigung durch die Person, die dieses Kleidungsstück trägt, ein effizientes aerodynamisches Profil in Übereinstimmung mit einem Bereich (19) definiert, der zwischen dem Höcker (2) des Kleidungsstücks und dem hinteren Bereich (9) eines Helms (8), den die Person auf dem Kopf trägt, definiert ist.

14. Verfahren zur Identifizierung und/oder Definition des aerodynamischen Höckers für ein vorzugsweise sportliches Kleidungsstück (3), insbesondere für einen Anzug oder eine Jacke für einen Motorradfahrer, Radfahrer, Skifahrer oder dergleichen, das auf der Grundlage der Bedürfnisse und Eigenschaften des Fahrers und/oder des Fahrzeugs und/oder der entsprechenden durchgeführten aerodynamischen Tests optimiert ist, wobei dieses Verfahren umfasst

- Ausgehen von einem Kleidungsstück mit einem aerodynamischen Höcker (2), der standardmäßig und/oder nicht optimiert ist,
- Herstellen eines Elements (1) nach einem oder mehreren der vorstehenden Ansprüche, so dass der Körper (6) des Elements (1) in aufeinanderfolgenden und unterschiedlichen Momenten mindestens zwei verschiedene Konfigurationen annimmt,
- Zuordnen jeder Konfiguration des Körpers (6) des Elements (1) nacheinander zu dem standardmäßigen und/oder nicht optimierten aerodynamischen Höcker (2) und Einstellen der Position des Körpers (6) in Bezug auf den Höcker, bis die Position und die Konfiguration des Körpers (6) des Elements (1) identifiziert ist, die es ermöglicht, das effizienteste aerodynamische Profil in Übereinstimmung mit dem Bereich (19) zu erhalten, der zwischen dem Höcker (2) und dem hinteren Bereich (9) des Helms (8) definiert ist.

15. Verfahren zur Identifizierung und/oder Definition des aerodynamischen Höckers für ein vorzugsweise sportliches Kleidungsstück (3), insbesondere für einen Anzug oder eine Jacke für einen Motorradfahrer, Radfahrer, Skifahrer oder dergleichen, das auf der Grundlage der Bedürfnisse und Eigenschaften des

Fahrers und/oder des Fahrzeugs und/oder der entsprechenden durchgeführten aerodynamischen Tests optimiert ist, wobei dieses Verfahren umfasst

- Ausgehen von einem Kleidungsstück mit einem aerodynamischen Höcker (2), der standardmäßig und/oder nicht optimiert ist,
- Herstellen von mindestens zwei Elementen (1) nach einem oder mehreren der vorstehenden Ansprüche, wobei die jeweiligen Körper (6) der mindestens zwei Elemente (1) voneinander unterschiedliche Konfigurationen aufweisen,
- sequentielles Zuordnen des Körpers (6) jedes der Elemente (1) zu dem standardmäßigen und/oder nicht optimierten aerodynamischen Höcker (2) und Einstellen der Position des Körpers (6) in Bezug auf den Höcker, bis die Position identifiziert ist und das Element (1), das es ermöglicht, das effizienteste aerodynamische Profil in Übereinstimmung mit dem Bereich (19) zu erhalten, der zwischen dem Höcker (2) und dem hinteren Bereich (9) des Helms (8) definiert ist.

Revendications

1. Elément aérodynamique (1) pour vêtement (3), de préférence sportif, notamment pour combinaison ou veste de motocycliste, cycliste, skieur ou analogue, comprenant :

- un corps (6) configuré pour être associé de manière amovible et repositionnable à une bosse aérodynamique (2), prévue dans ledit vêtement (3), et de sorte que, lors de l'exécution du geste sportif par le sujet portant ledit vêtement, définit un profil aérodynamique efficace en correspondance avec une zone (19) définie entre ladite bosse (2) dudit vêtement et la zone arrière (9) d'un casque (8) porté sur la tête par ledit sujet,

et **caractérisé en ce que** ledit corps (6) comprend :

- une pluralité d'ouvertures traversantes (14) destinées à être traversées par des moyens de fixation (12) pour contraindre ledit corps (6) à ladite bosse (2), lesdites ouvertures traversantes (14) étant conformées et/ou agencées de manière à permettre de régler et/ou modifier la position et/ou l'inclinaison dudit corps (6) par rapport à ladite bosse (2), et/ou
- une pluralité de moyens de fixation (12) intégrés et/ou solidaires dudit corps (6) et destinés à coopérer avec des trous profilés (13) correspondants ménagés dans ladite bosse (2), lesdits trous profilés (13) étant profilés et/ou agencé de manière à permettre un réglage et/ou une modification de la position et/ou de l'inclinaison dudit corps (6) par rapport à ladite bosse (2).

2. Elément aérodynamique selon la revendication 1, **caractérisé en ce que** ledit corps (6) est configuré de manière à faire saillie de la bosse (2) vers le casque (8), de manière à réduire la distance en correspondance avec la zone (19) qui sépare le casque lui-même dudit corps (6).

3. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé par le fait que** la forme et/ou la taille dudit corps (6), et/ou son positionnement par rapport à ladite bosse (2), modifie le profil aérodynamique de la bosse elle-même, de préférence au niveau de sa zone avant (17).

4. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé par le fait que** la forme et/ou la taille dudit corps (6), et/ou son positionnement par rapport à ladite bosse (2), rendent le profil aérodynamique qui depuis le casque (8) continue vers la bosse elle-même sensiblement continue/linéaire.

5. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** lesdits moyens de fixation (12) comprennent des éléments/organes séparés qui s'engagent directement dans le corps (6) et/ou la bosse (2), et/ou ils comprennent des éléments séparés qui sont en prise avec des contre-éléments correspondants fixes/engagés ou solidaires du corps (6) et/ou de la bosse (2).

6. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit corps (6) de l'élément (1) est positionné au-dessus et à l'extérieur par rapport à la partie (10) du vêtement (3) avec un développement sensiblement laminaire qui recouvre ladite bosse (2).

7. Élément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit corps (6) est configuré pour être positionné en dessous et à l'intérieur par rapport à la partie (10) du vêtement (3) avec un développement sensiblement laminaire couvrant ladite bosse (2) et être liée et/ou en contact avec ladite bosse (2).

8. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé par le fait que** le corps (6) de l'élément (1) a une conformation sensiblement laminaire et incurvée pour se fondre en continuité avec le profil de ladite bosse (2).

9. Elément aérodynamique selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce**

que ledit corps (6) est réalisé par thermoformage, notamment à partir d'une tôle plane, ou est réalisé par moulage par injection.

10. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit corps (6) comprend une partie avant (25) configurée de telle manière que - lors du geste sportif par la personne portant ledit vêtement, par exemple lorsque un motocycliste prend la position de conduite - interagit du point de vue aérodynamique avec la zone arrière (9) et/ou avec l'éventuelle aile (7) du casque (8).

11. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit corps (6) comprend des passages d'entrée (20) et des passages de sortie d'air (22) de l'air.

12. Elément aérodynamique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit au moins un corps (6) est également fixé de manière amovible et directement à ladite partie (10) avec un développement sensiblement laminaire qui recouvre extérieurement et supérieurement ladite bosse (2), de préférence au moyen d'un raccord rapide et/ou d'une couture.

13. Vêtement de sport (3), de préférence vêtement de sport, en particulier combinaison ou veste de motard, cycliste, skieur ou similaire, **caractérisé en ce qu'**il comprend, en correspondance avec la zone arrière du vêtement qui - lorsqu'il est porté - recouvre la partie supérieure du remontant jusqu'à la zone située entre les épaules de la personne qui la porte, une bosse aérodynamique (2) avec un élément (1) selon une ou plusieurs des revendications précédentes qui est amovible et repositionnable associée à ladite bosse aérodynamique (2) de sorte que, lors de l'exécution du geste sportif par le sujet portant ce vêtement, elle définisse un profil aérodynamique efficace en correspondance avec une zone (19) définie entre ladite bosse (2) de ledit vêtement et la zone arrière (9) d'un casque (8) porté sur la tête par ledit sujet.

14. Procédé d'identification et/ou de définition de bosse aérodynamique pour un vêtement (3), de préférence sportif, notamment pour une combinaison ou une veste de motocycliste, cycliste, skieur ou analogue, qui est optimisé en fonction des besoins et caractéristiques du pilote et/ou celles du véhicule et/ou les essais aérodynamiques correspondants effectués, cette méthode implique

- à partir d'un vêtement présentant une bosse aérodynamique (2) standard et/ou non optimisée,
- préparer un élément (1) selon une ou plusieurs des revendications précédentes, de sorte que le corps (6) dudit élément (1) adopte, en séquence et à des moments distincts, au moins deux configurations différentes,
- associer en séquence chaque configuration du corps (6) dudit élément (1) à ladite bosse aérodynamique standard et/ou non optimisée (2) et régler la position dudit corps (6) par rapport à ladite bosse jusqu'à la position est identifiée et la configuration du corps (6) de l'élément (1) qui permet d'obtenir le profil aérodynamique le plus efficace en correspondance avec la zone (19) définie entre la bosse (2) et la zone arrière (9) du casque (8).

15. Procédé d'identification et/ou de définition de bosse aérodynamique pour un vêtement (3), de préférence sportif, notamment pour une combinaison ou une veste de motocycliste, cycliste, skieur ou analogue, qui est optimisé en fonction des besoins et caractéristiques du pilote et/ou celles du véhicule et/ou les essais aérodynamiques correspondants effectués, cette méthode impliquant

- à partir d'un vêtement présentant une bosse aérodynamique (2) standard et/ou non optimisée,
- préparer au moins deux éléments (1) selon une ou plusieurs des revendications précédentes, les corps respectifs (6) desdits au moins deux éléments (1) ayant des configurations différentes entre eux,
- associer séquentiellement le corps (6) de chacun desdits éléments (1) à ladite bosse aérodynamique standard et/ou non optimisée (2) et ajuster la position dudit corps (6) par rapport à ladite bosse jusqu'à ce que la position soit identifiée et l'élément (1) qui permet d'obtenir le profil aérodynamique le plus efficace en correspondance avec la zone (19) définie entre la bosse (2) et la zone arrière (9) du casque (8).

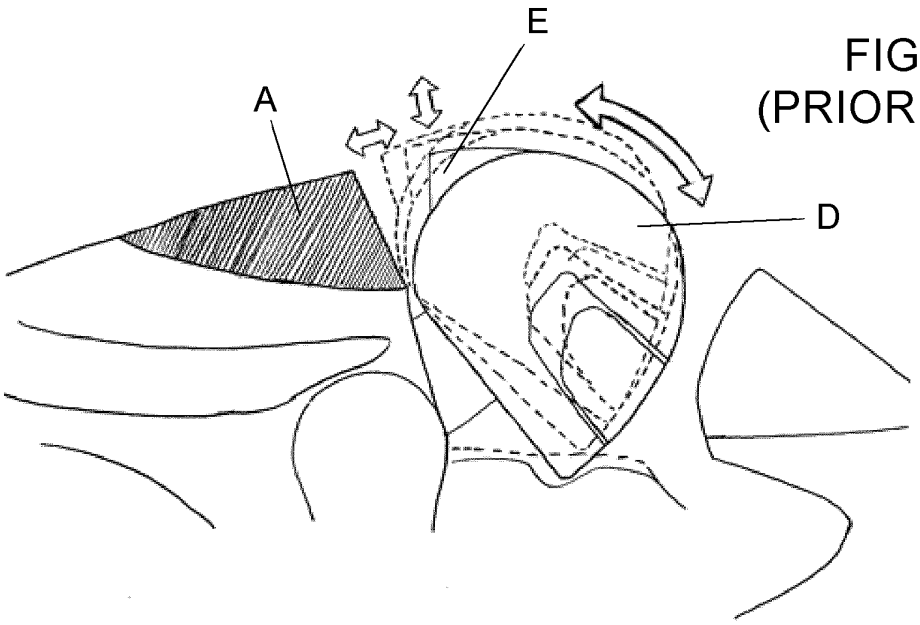


FIG. 1
(PRIOR ART)

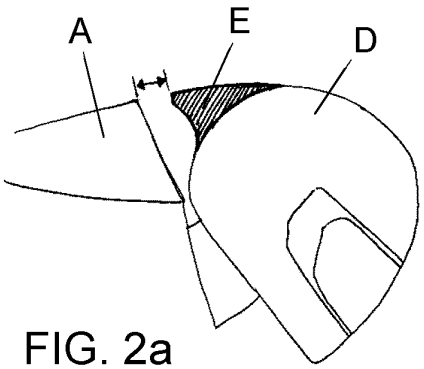


FIG. 2a
(PRIOR ART)

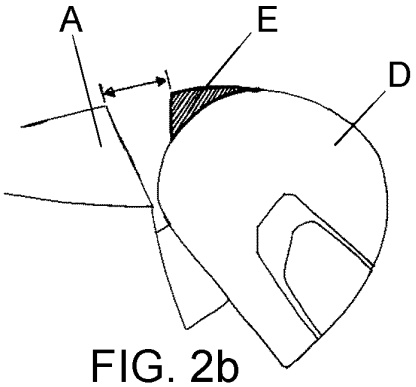


FIG. 2b
(PRIOR ART)

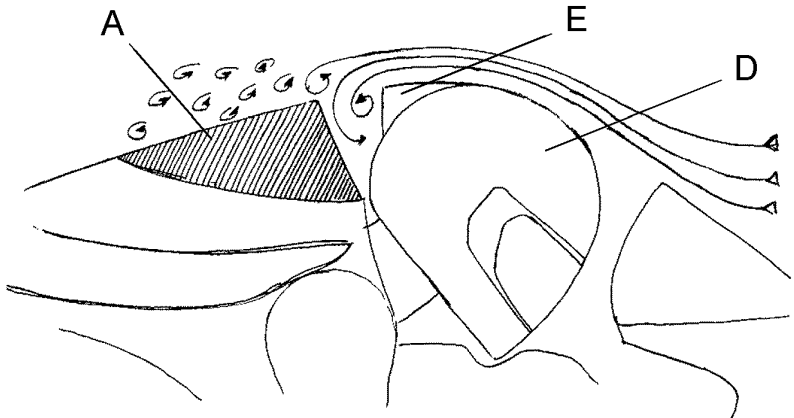


FIG. 3 (PRIOR ART)

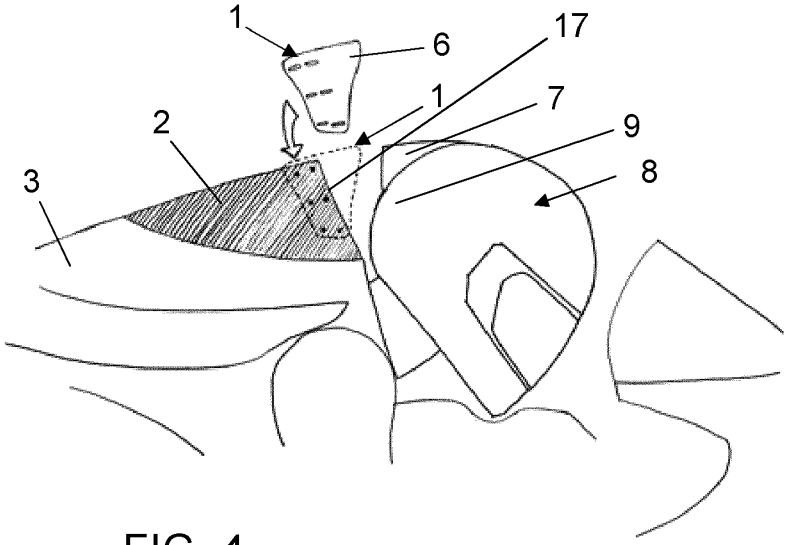


FIG. 4

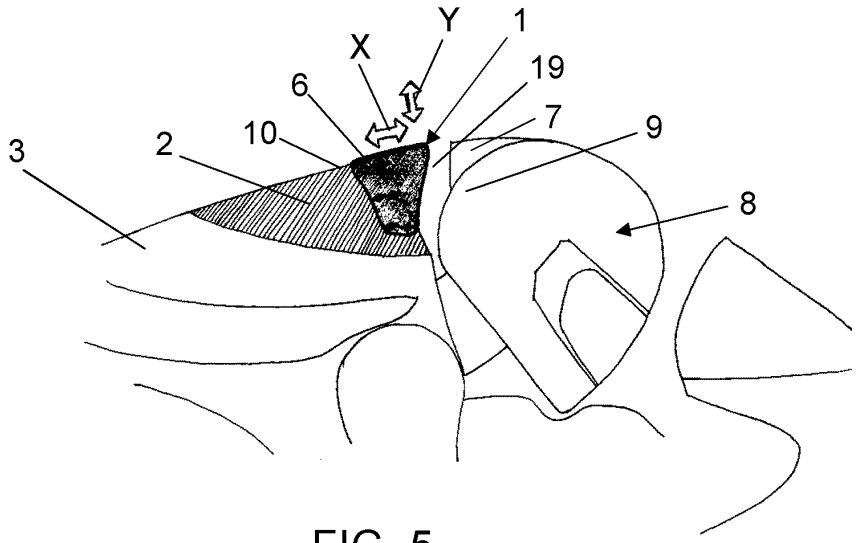


FIG. 5

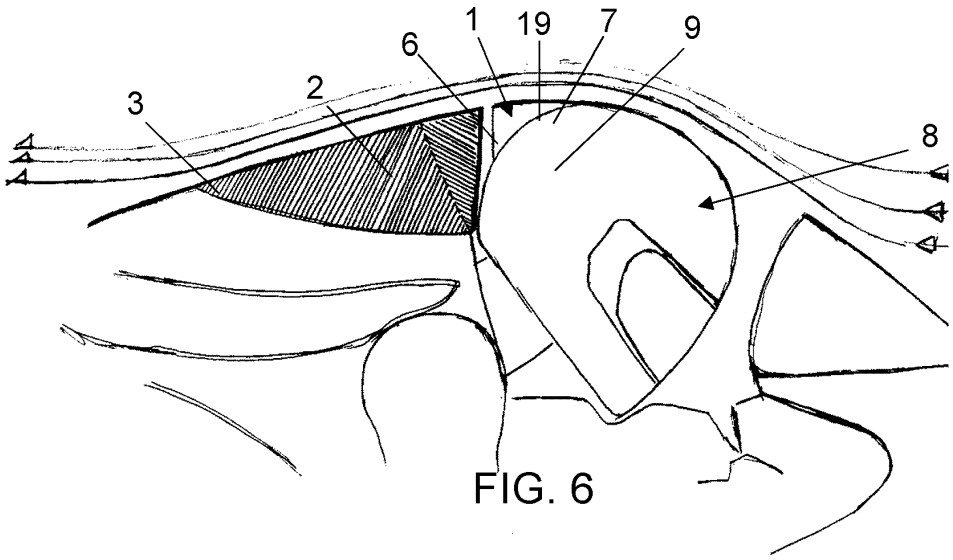


FIG. 6

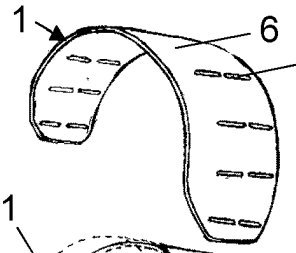
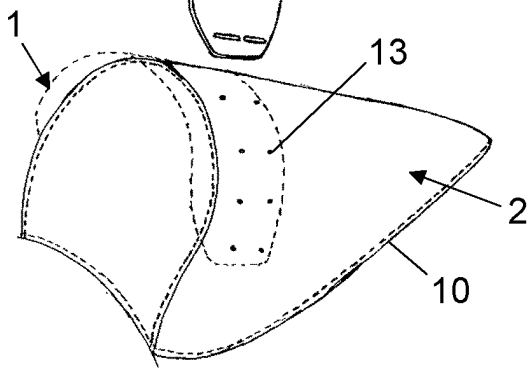


FIG. 7



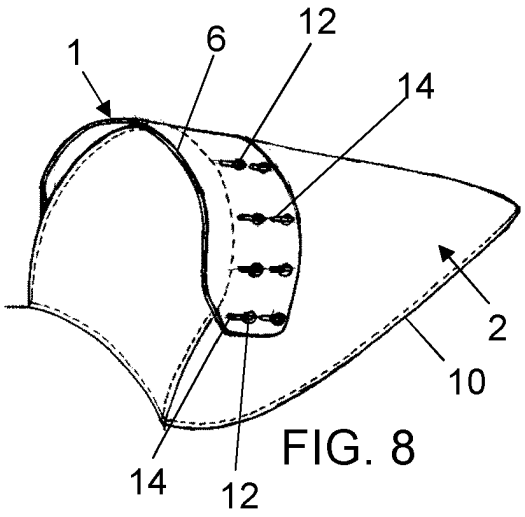


FIG. 8

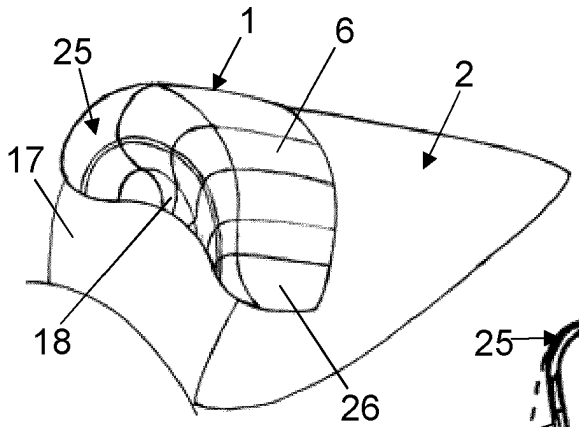


FIG. 9a

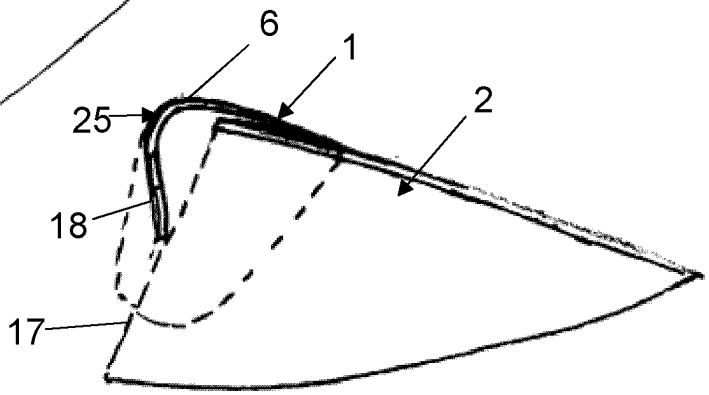


FIG. 9b

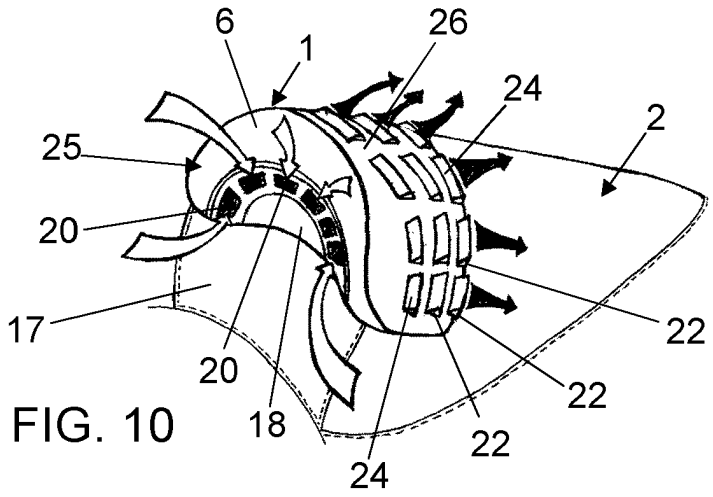


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 29617135 **[0005]**
- DE 102012214061 **[0005]**
- WO 2007116377 A **[0009]**
- IT 102019000003315 **[0035]**
- EP 20161637 **[0035]**