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(54) **A PROTECTIVE HELMET FOR EQUESTRIAN SPORTS**

(57) A protective helmet for equestrian sports comprising:

- A shell (1), fit to protect the wearer's head in the event of impact;
- An anti-shock protection element (7, 8) connected to

the shell in such a way as to cover and protect, in use, the wearer's nose and eyes;

- According to the invention, said anti-shock element is in form of an anti-shock visor (7).

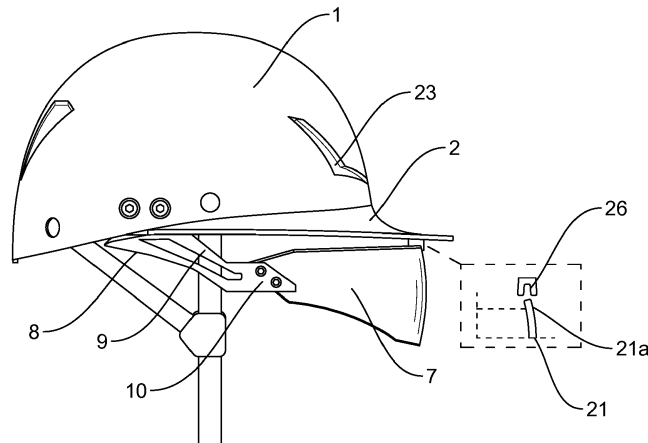


FIG. 1

## Description

### Technical field

**[0001]** The present invention relates to the technical field of protective accessories in equestrian field.

**[0002]** In particular, the invention relates to a protective helmet for the use in equestrian sports, in particular in the game of polo, with such features as to give a suitable protection not only of head but also of eyes, part of the face including the nose.

### Brief outline of the prior art

**[0003]** All equestrian sports, in which a rider is riding a horse, are based on different gait speeds, of which the main ones are the trot and the gallop. The trot is a gait jumped in two steps for diagonal bipeds in the succession of the right rear with the left front or, vice versa, with the left rear with the right front. It is to be reminded that this pace normally reaches a speed between 10 and 55 km/h; there is even a special gait called the rising trot in which the rider rises from the saddle, rhythmically raising and lowering the pelvis. The gallop is the fastest gait, in which the right rear of the horse guides the action and in which the sequence is: left rear, left diagonal biped, front right followed by a time of suspension (fourth time). A galloping English thoroughbred can reach 70 km/h, even if only for a few minutes. This digression is intended to focus on the potential danger of equestrian sports, not only with respect to accidental falls or clashes between two mounted horses or more generally to the impact with an obstacle on the path, but also with respect to foreign bodies of the type of stones, branches or other bodies bouncing from the ground that could, in the action in speed, hit the face or the eyes of the rider with understandable discomfort and consequent danger, in the event in which the rider does not wear a full-face helmet. This is particularly evident in the game of polo. Polo, a sport belonging to the equestrian discipline, consists of a game, which lasts from four to eight times, called "chukker" played on a grass field or in sand (but sometimes also on icy surfaces) between two teams each formed by four horseback players, also called knights, who must, riding, hit a wooden or hard plastic ball with a bamboo stick, held only with the right hand, and direct it towards the door of the opposing team. A referee is also present on the field. The game is won by the team that scores the highest number of goals. Among the rules governing this sport, there are some requirements regarding the equipment of the horse and the clothing of the player/rider, for example the obligation for the latter to wear riding boots (on which spurs with protruding studs or buckles are not allowed), gloves, knee-protectors, cuffs, riding whip. Among the equipment that every player must wear, there is also a helmet to protect the player's head in the event of a fall from a horse or other collisions. Below in the description a protective helmet is also called "headgear", to be intended

here as a synonym of helmet. The protective headgear normally used in polo, in addition to providing protection to the rider's head, must also be not excessively heavy, easily and comfortably wearable and if necessary releasable. In the state of the art there are known protective headgears that are normally used in equestrian sports such as dressage, show jumping and even in polo, consisting of a protective cap, normally made of rigid material, usually polystyrene or polycarbonate, fiber made of glass, Kevlar, with soft, normally breathable inner padding and equipped with a brim that protrudes frontally from the upper part of the shell; these headgears are also equipped with a chin strap which, appropriately adjusted and hooked under the user's throat, enables to fix and keep the helmet in a stable position on the rider's head. Polo helmets equipped with an element for protecting the player's face, in the form of a chin-guard, are also known that are designed to protect the player from an accidental impact with the horse's head from accidental impacts with the mallet, such as those described by the patents USD 490,572 Finquel and US 6,978,477 Foote. However, these headgears known in the state of the art have the disadvantage not to ensure effective protection for the user's eyes, since they are not equipped with any visors, screens or other protective elements positioned on the player's eyes. If this disadvantage may not be particularly significant in some equestrian disciplines, such as in dressage, it becomes very important in the game of polo. During a game, which always takes place outdoors, external elements such as dust, fine dust, insects, stones or small parts of the playing field may accidentally hit a player and penetrate one or both eyes, thus causing irritation, tearing, a sense of ailment and severely limiting the player, in particularly serious cases, to prevent him from continuing the game. Moreover, being the season of activity of polo throughout the months from April to October, in the majority of cases, players are exposed to the external climatic conditions that may vary from having the sun that directly hits the eyes, when the player is in a position on the field against the sun, or from the wind which, with sudden gusts and even without raising dust, debris or other irritating bodies may cause irritation to the player's eyes. Finally, the development of the game itself may sometimes cause dangerous situations, for example the ball or the mallet may accidentally hit the player's face. To overcome these drawbacks, polo players use sunglasses in some circumstances, the type of sports glasses known in the state of the art, in combination with the protective helmet; however, these glasses have the disadvantage of having to be worn on the user and be mobile, that is, not fixed either to the helmet or to the user's head, so in the event of impact or if hit by the impact with the ball or in the event of particularly powerful or fast ride, they could accidentally fall from the player's face and end up on the field, constituting a serious danger for horses and other players. Moreover, considering that the player has the obligation to hold the mallet with the right hand while with the left he holds the bridle with which

he controls and guides his horse, the possibilities of correctly wearing the glasses on, keeping them in position or wearing them again after having lost them are extremely limited and generate dangerous situations for the safety of the player himself, teammates and opponents. There are also sport glasses equipped with an elastic tubular cord having two open ends into which the slats of the glasses can be inserted, which are thus kept together behind the wearer's head, but this causes a considerable encumbrance and generates a thickness under the protective helmet, such that this type of glasses is normally not suitable for use in combination with a rigid or semi-rigid protective headgear such as that used in polo. Protective glasses or protective masks of the type used by skiers or motorcyclists of the cross/off-road specialty are also known and commonly sold, consisting of a protective screen like a pair of glasses, equipped with a usually elastic band which ensures the maintenance of the glasses in position once worn by the user. These protective glasses have very large lenses and are suitable to be worn in combination with a protective helmet, but are worn "above", i.e. outside, of the helmet itself. This solution has great disadvantages in the event of the game of polo, in which the protective helmet is a rigid or semi-rigid but light headgear and is equipped with a protruding brim that would not allow the glasses to adhere to the user's face. Likewise, even the protective helmets equipped with a visor integrated into the helmet, such as those used by motorcyclists or Formula One riders, have great disadvantages for the use in equestrian sports and particularly in the game of polo, being too heavy to wear and too rigid, not enabling freedom of movement to the player's head and therefore limiting it very much in his actions of game, preventing him a lateral vision that is instead essential when he must look for the ball, often bouncing between the legs of the other horses mounted by the opponents. In the state of the art, some findings are known that provide for the combination of a pair of glasses or a visor connected to a protective helmet. US Patent 5,890,233 Kaffka discloses a double visor system for light sports helmets, particularly of the type used by cyclists in which the user can lower the first visor and then the second visor by pressing a button on the side of the point with one hand in which the visor is fixed to the helmet; always with a movement of the hand acting on the lower edge of the visor, this is made retract thus remaining locked. The visor system, connected to the helmet by a system of pins fixed on a base which is in turn fixed to the helmet by means of stickers, is removable and in the event of a collision it can separate itself independently from the helmet. The main drawback of this solution is the need to manually operate the first visor and the second visor which, although pre-fixed to the helmet, require manual intervention by the user who is therefore forced to make a dangerous movement or at least less careful for making the visor to go down, such as temporarily leaving the bicycle handlebar. US patent 8,286, 269 Springer et al. concerns a rigid headgear with

a pair of glasses attached to it, of the type used by miners or construction workers in which the glasses are fixed in the helmet, being able to retract and be housed in a space between the rigid shell and the external cover for covering the helmet; when in use, the system for fixing the glasses to the helmet according to the patent enables the adjustment of the position of the glasses within a predetermined space on a horizontal plane and in the forward-backward direction to adjust the distance of the glasses by moving them away from or closer to the user's face; the pair of glasses is mounted on the helmet and is adjusted using an adjustable pin system. The main drawback of this type of helmet-glasses system is that the helmet must have a space on the front of the shell to make the glasses retract, so that it cannot be equipped with protruding brims or visors. US patents 6,892, 393 and US 8,245,320 Provost et al. disclose a visor connected to a helmet, of the type used for protection in the event of work in contact with dangerous substances, by means of a fixed interlocking coupling of two lateral tabs in housings specially provided on the sides of the helmet to which the lenses, separated as in a pair of glasses, forming the visor, have an adjustable inclination. Also in this case, the main drawback is in the mobility and the adjustability of the visor by the user who is forced to act manually to move or adjust the position of the lenses in front of the eye, making the invention suitable for use in static situations and when the user has time to act, in safety, and change the visor-helmet structure.

#### Summary of the invention

**[0004]** Therefore, the aim of the present invention is to provide a helmet for equestrian sports, in particular but not necessarily for polo, which resolves said technical disadvantages.

**[0005]** A great advantage would be in having a protective helmet for the use in particular but not necessarily for the game of polo, equipped with a protective element for the player's eyes, such as a visor or an anti-shock screen and which is stably and integrally fixed to the helmet headgear.

**[0006]** The aim of the present invention is to provide for a protective helmet for equestrian sports, for the use in particular for polo, suitable for protecting, in the event of impact, the most critical areas of the player's head and in particular the face, the nose and the eyes, having an anti-shock mean, said mean stably and integrally fixed to the shell of the helmet by means of stable connection, restraining, engaging element.

**[0007]** A further aim of the invention is that the anti-shock protection mean does not constitute an encumbrance and does not modify the comfort and lightness of the protective helmet or headgear.

**[0008]** Another aim of the invention is to provide for a protective helmet for equestrian sports, for the use in particular for polo, equipped with an anti-shock protective mean for the player's face, which does not require a man-

ual intervention for the use and which does not constitute an element of inattention or danger for the player during the game.

**[0009]** A further aim of the present invention is the fact that the integration of said protection element can occur in simple and inexpensive manner on any type of rigid or semi-rigid helmet or headgear in production, without any needs of invasive or important change of its structure, thus maintaining the structural features of the shell of the protective helmet unchanged.

**[0010]** These and other aims are achieved by a protective helmet for equestrian sports, according to claim 1.

**[0011]** This helmet is adapted for being used particularly in the game of polo, even if fit to be used in any equestrian sports.

**[0012]** It is adapted for protecting, in the event of impact, the most critical point of the player's head and in particular the face, the nose and the eyes and for this purpose, it is equipped with an anti-shock mean.

**[0013]** According to the invention, this anti-shock mean is in form of a visor which protects the eyes, the nose and the face.

**[0014]** The visor is a continuous surface, thus well shielding the eyes, the nose and part of the face from the impact of bodies such as stones or other elements.

**[0015]** It can be made of many materials with great anti-shock features, such as polycarbonate or similar ones.

**[0016]** Advantageously, this anti-shock mean is connected in at least three fixing points to the shell of the protective helmet through connection elements and integrally and stably fixed to it through stable restraining and engaging means.

**[0017]** In this manner, through this stable fixing, it absorbs well impacts thus remaining in its position.

**[0018]** Advantageously, at least two of said connection means are fixed to the peripheral lower edge of the shell, being symmetric and parallel, and an engaging element is fixed to the front lower end of said shell, said front lower end being arranged within said shell or on the brim-shaped plane extension thereof.

**[0019]** Further advantages are inferable from the remaining dependent claims.

#### Brief description of the drawings

**[0020]** Additional features and advantages of the present helmet, according to the invention, will become apparent from the following description of preferred embodiments thereof, given only by way of non-limiting example, with reference to the attached drawings, wherein:

- Figure 1 depicts a protective helmet equipped with the anti-shock protection mean in a lateral view;
- Figures from 2 to 5 are further axonometric view of the present helmet according to the invention;
- Figure 6 depicts an example in which a user wears this helmet for protecting his face, in particular nose

and eyes, as it is inferable from the figure.

#### Description of some preferred embodiments

**[0021]** A protective helmet, according to the invention and also as depicted in figures, is equipped with a protective shell 1.

**[0022]** For example, in the specific case of polo, this shell is equipped with a plane extension 2 in the front part which forms a horizontal visor (brim-shaped 2).

**[0023]** Moreover, the helmet comprises a protective anti-shock mean suitable for protecting frontally the most critical point of the player's head and in particular the face, the nose 5 and the eyes.

**[0024]** According to the invention, this anti-shock protection mean is in form of a visor.

**[0025]** Thus, referring to figure 1 which depicts the helmet ready for the use, as soon as it is worn, the visor 7 is protecting eyes and nose, so that it has such an arrangement as to be positioned in front of the eyes and with such a surface extension as to cover the nose.

**[0026]** The shell 1 is normally made of polycarbonate or polystyrene and it is rigid or semi-rigid, resistant and internally padded with a soft, expanded and comfortable material.

**[0027]** Said shell is equipped at least frontally with at least two air inlets 23 and 23a (see for example figure 1 and figure 2), directly shaped on the external portion of said shell in order to enable the air passage and cooperate in improving ventilation inside the helmet.

**[0028]** As described, the protection element is constituted by an anti-shock visor 7, therefore shock resistant.

**[0029]** Moreover, it is comprised the connection system which enables to stably connect the said visor to the helmet so as to firmly fix the visor in position and with this connection system structured in such a way as not to yield and in order to help to absorb the impact.

**[0030]** For this purpose, the connection occurs in three points, i.e. laterally to the two sides of the shell and centrally.

**[0031]** The visor substantially connects itself by its two ends to the sides of the shell and centrally, in the axis of symmetry thereof, to a corresponding point of the shell.

**[0032]** In the event of embodiment with brim-shaped horizontal visor 2, as per the attached figures, the central connection point is obviously arranged in a corresponding point of the horizontal visor 2.

**[0033]** Going forward in greater detail of the invention, as depicted in figure 2 for example, two brackets 9, 9a are provided.

**[0034]** The brackets are the interposed elements used for connecting the end of the visor to the shell.

**[0035]** Therefore, one of the two brackets (9, 9a) is fixed through a part to the end of the visor and through the opposite part to the shell.

**[0036]** The same occurs with the counterposed bracket on the opposite side.

**[0037]** The connection is very simple as it can use tra-

ditional pins such as those which pass to a lock position through a turn or a half-turn within the corresponding hole in which they are inserted or, rotating them to the opposite side, pass to an unlock position.

**[0038]** They are well known in the state of art, for example in the field of motorcyclist helmets for assembling the regular windproof visor and they are not described further here.

**[0039]** More particularly, said brackets 9, 9a are fixed to the shell 1 through two fixing plates 10, 10a (see for example figure 2, 3).

**[0040]** In particular, the brackets can end, on the opposite side to the connection side with the protection 7, with said two fixing plates (10, 10a) whose purpose is to be inserted in contact with the inner shell and to house the fixing pins (see the pins 12 and 12a of figure 3). Therefore, the plates (10, 10a) are suitably holed for housing the pins.

**[0041]** The brackets (9, 9a), on the opposite side to the connection side of the shell, shape a sort of plate or surface suitable for leaning on the end of the visor 7 on corresponding holes in order to also fix the equivalent pins 15, 15a, 16, 16a (see for example figure 3).

**[0042]** In this manner, the visor is stably, laterally fixed.

**[0043]** In order to ensure a safer fixing suitable for the anti-shock purpose, the said visor 7 is equipped with an engagement element 11 (see for example figure 3) projecting for a small portion and arranged in the middle part on the upper edge of said visor 7.

**[0044]** It is fit to engage itself centrally to said brim 2 projecting from said shell 1 when said visor 7 minimally moves (minimum degree of translation) from the bottom to the top, through said brackets 9, 9a, acting on the pins 10, 10a. The said engaging element 11 is constituted by a terminal portion 21 whose head 21a engages itself, from bottom to top, in corresponding engaging means (22, 24, 26), for example in form of a receiving snap-like cavity 26 or similar solutions.

**[0045]** The two pins 25, 25a on the lower side of said brim 2 enable to fix said engaging elements to the brim 2 (see for example figure 3).

**[0046]** The said engaging elements can be constituted for example by a small wedge 24 on which a seat 26 is obtained fit to receive said head 21a, thus locking said visor 7 in a position of protection of the face 4, the nose 5 and in particular in front of the wearer's eyes 6.

**[0047]** The preferred embodiment described here achieves the purpose of having a mean of protection of the user's head constituted by a protective helmet/headgear constituted by a shell 1, equipped with a brim 2, a protection element for eyes and face firmly fixed to said brim and to the relative shell. The protection element is in form of this anti-shock visor which is fully removable when all the fixing pins are unscrewed and, equally, easily reapplicable.

**[0048]** During use it is possible to simply unhook the head 21a arranged on the terminal element 21 of the engaging element from the wedge 24 which holds it in

the seat 26 fixed on said brim 2. In this way, said visor 7 remains firmly connected by means of the two lateral mounting brackets to the whole protective helmet, remaining in a slightly lower position.

**[0049]** At the moment of use it is also locked centrally through the central snap-like system (21a, 26) described.

**[0050]** The air inlets 23, 23a on the shell cooperate with the protective helmet-visor assembly in order to ensure protection to the head, face, nose, eyes of the user and at the same time maintaining maximum wearability and maximum comfort of the helmet particularly during the game play.

**[0051]** The construction material of the anti-shock visor, in order to perform its function is preferably made of polycarbonate.

**[0052]** The thicknesses are preferably in the range from 2 to 4mm, preferably approximately 3mm.

**[0053]** Other materials can be used, for example, plastic and plexiglass. In this case, preferably, the thicknesses can be higher than the previous ones, for example in a range between 3 and 6mm, for example 4mm or 5mm in thickness.

**[0054]** Plastic material have the advantage of being cheaper.

**[0055]** Regardless of the construction materials, the procedure can be in injection molding or thermoforming.

**[0056]** The same materials could also be used for the brackets (9, 9a).

**[0057]** Obviously, the visor 7 is transparent to enable to see through it and therefore forms, as shown in the figures, a continuous surface of protection.

**[0058]** Therefore, figure 6 shows the helmet with the visor, subject of the invention, in a protective position of use and with the helmet worn by a user.

**[0059]** The present invention is preferably addressed to the helmets for polo but, obviously, it is equally applicable to helmets for equestrian sports of a different type from polo.

## Claims

1. A protective helmet for equestrian sports, comprising:

- A shell (1) suitable for protecting the wearer's head in the event of impact;
- An anti-shock protection mean (7, 8) connected to the shell in such a way as to cover and protect, in use, the eyes and at least a part of the wearer's nose;
- **Characterized in that** said anti-shock protection mean is in form of an anti-shock visor (7).

2. A helmet, according to claim 1, wherein said visor (7) is connected in at least three fixing points (12, 12a, 24, 24a, 2) to the shell and whose two points arranged laterally to the shell and one point arranged

- onto the longitudinal axis of symmetry of the shell.
3. A helmet, according to claim 1 or 2, wherein said visor is connected to the shell in movable and reconnectable manner.
  4. A helmet, according to one or more of the preceding claims from 1 to 3, wherein connection means are comprised for connecting the said visor (7) to the shell (1), said connection means comprising:
    - At least two fixing pins (12, 12a) arranged laterally, one of them arranged laterally to the shell and the other arranged laterally on the opposite side of the shell;
    - A quick engaging mean (22, 24, 26) configured for enabling a connection of the visor to the front part of said shell on the longitudinal axis of symmetry of the shell.
  5. A helmet, according to one or more of the preceding claims, wherein said shell comprises one horizontal visor (2), the said quick engaging mean comprising first quick engaging means (26) applied to the said horizontal visor (2) in the point of symmetry thereof and suitable for coupling in releasable manner with corresponding second quick engaging means (21, 21a) provided in the anti-shock visor (7).
  6. A protective helmet, according to claim 5, wherein said second quick engaging means are projecting for a small portion and positioned in the middle part on the upper edge of said anti-shock visor (7) and suitable for hooking centrally to said horizontal visor (2) of said shell when said visor is moved from the bottom to the top.
  7. A helmet, according to claim 6, wherein said second quick engaging means are constituted by a terminal portion whose head inserts itself by snapping, from bottom to top, in corresponding said first quick engaging means, said first quick engaging means being constituted by a small wedge (24) on which a seat (26) is obtained suitable for receiving said head (21), thus locking said visor in a position of protection of the face, nose and in front of the wearer's eyes.
  8. A protective helmet, according to one or more of the preceding claims, wherein said visor (7) is fixed to said shell (1) through two lateral brackets (9, 9a), each one having at one end a fixing plate (10, 10a) which is applied in the inner surface of the side of said shell through pins (12, 12a).
  9. A protective helmet, according to one or more of the preceding claims from 1 to 8, wherein said anti-shock visor is made of a thermoplastic resin.
  10. A protective helmet, according to one or more of the preceding claims, wherein said visor is made of polycarbonate or plastic or plexiglass.
  11. A protective helmet, according to one or more of the preceding claims, wherein the thicknesses of the visor are comprised in a range from 2 mm and 6 mm, preferably 3 mm for polycarbonate and 4 mm for plastic.
  12. A protective helmet, according to any one of the preceding claims, **characterized in that** said shell is made of a rigid or semi-rigid resistant material such as thermoplastic resin like polycarbonate or polystyrene and it is internally padded with a soft, expanded, comfortable material to absorb the shock of any impacts even in the event of head-on collision.
  13. A protective helmet, according to one or more of the preceding claims, wherein said shell has at least two air inlets (23) on the frontal portion.

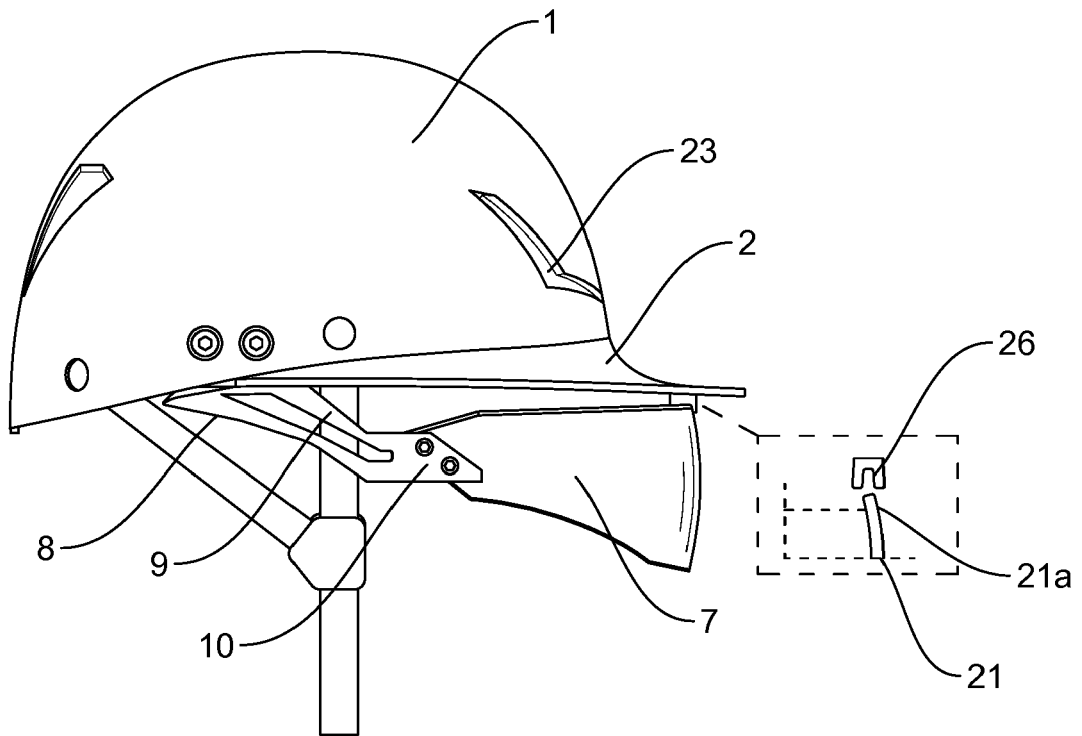


FIG. 1

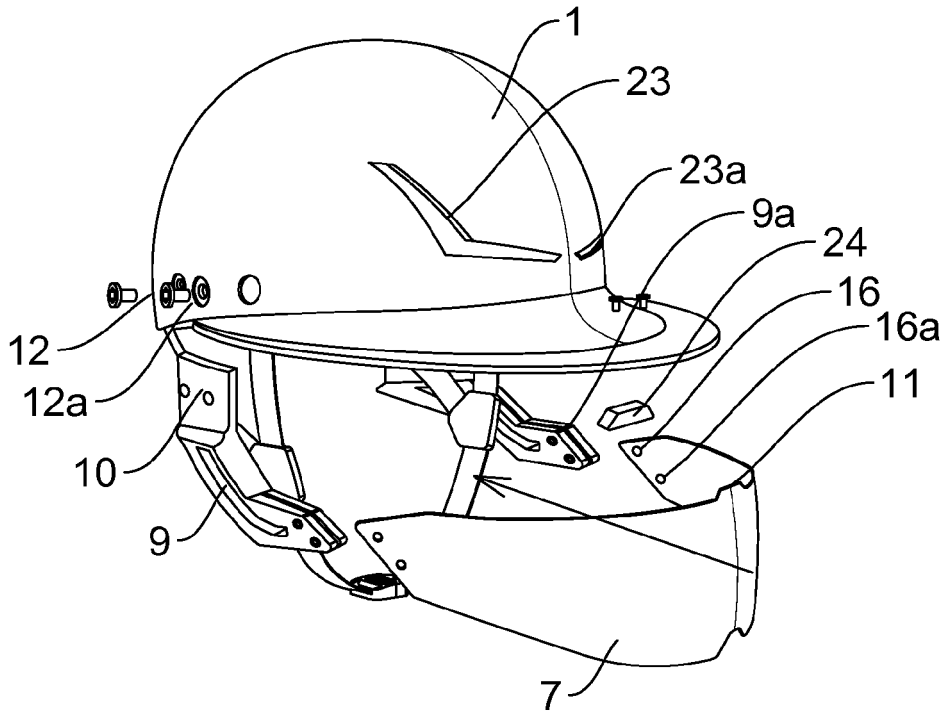


FIG. 2

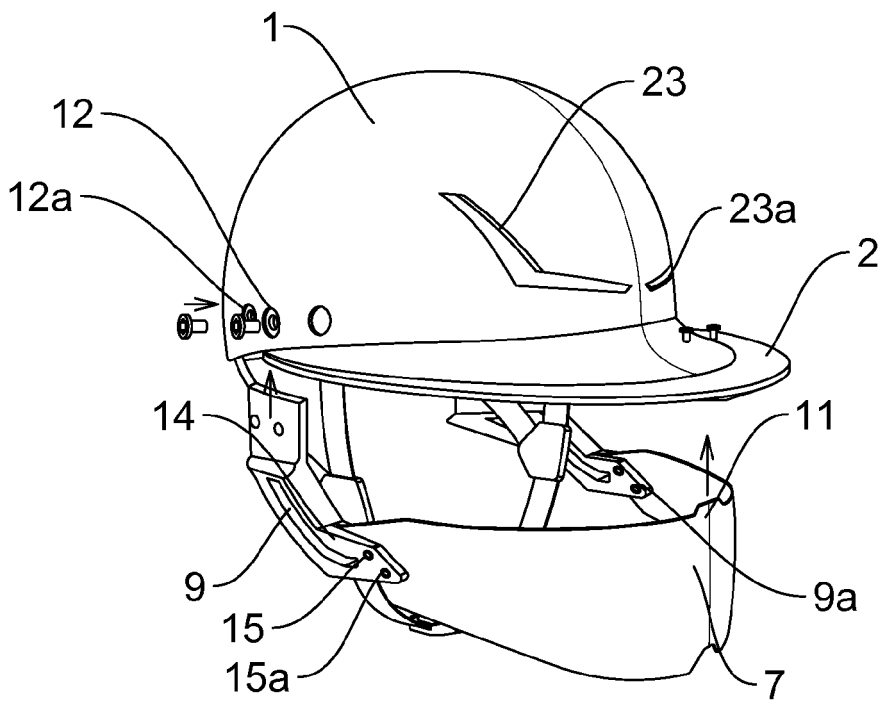


FIG. 3



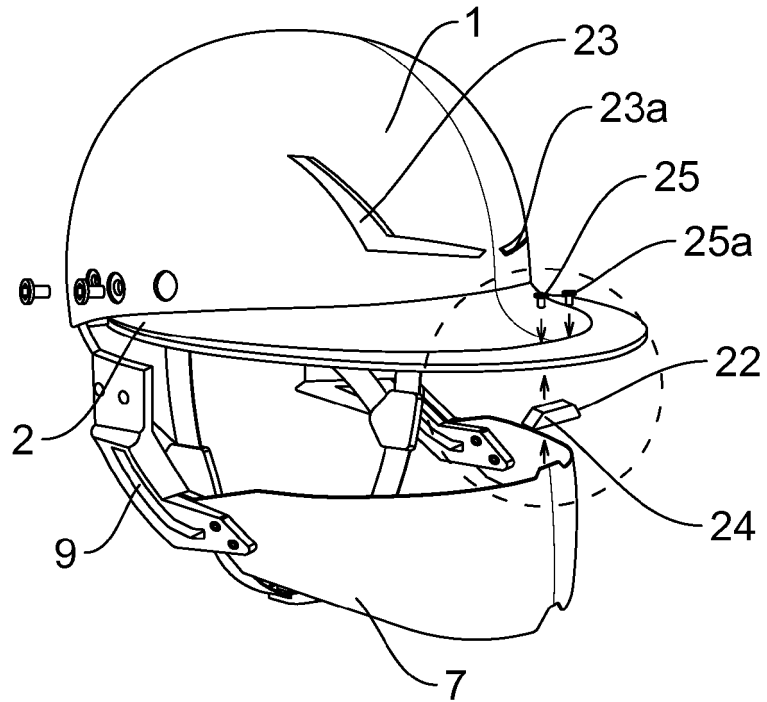


FIG. 4

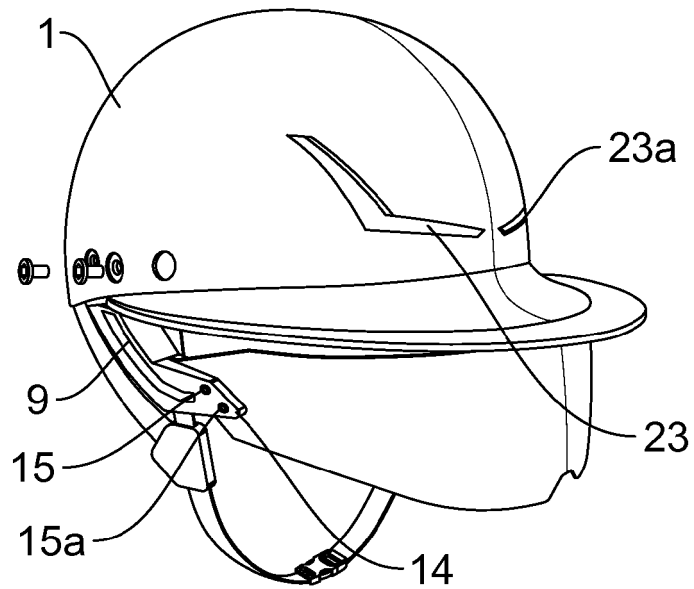


FIG. 5

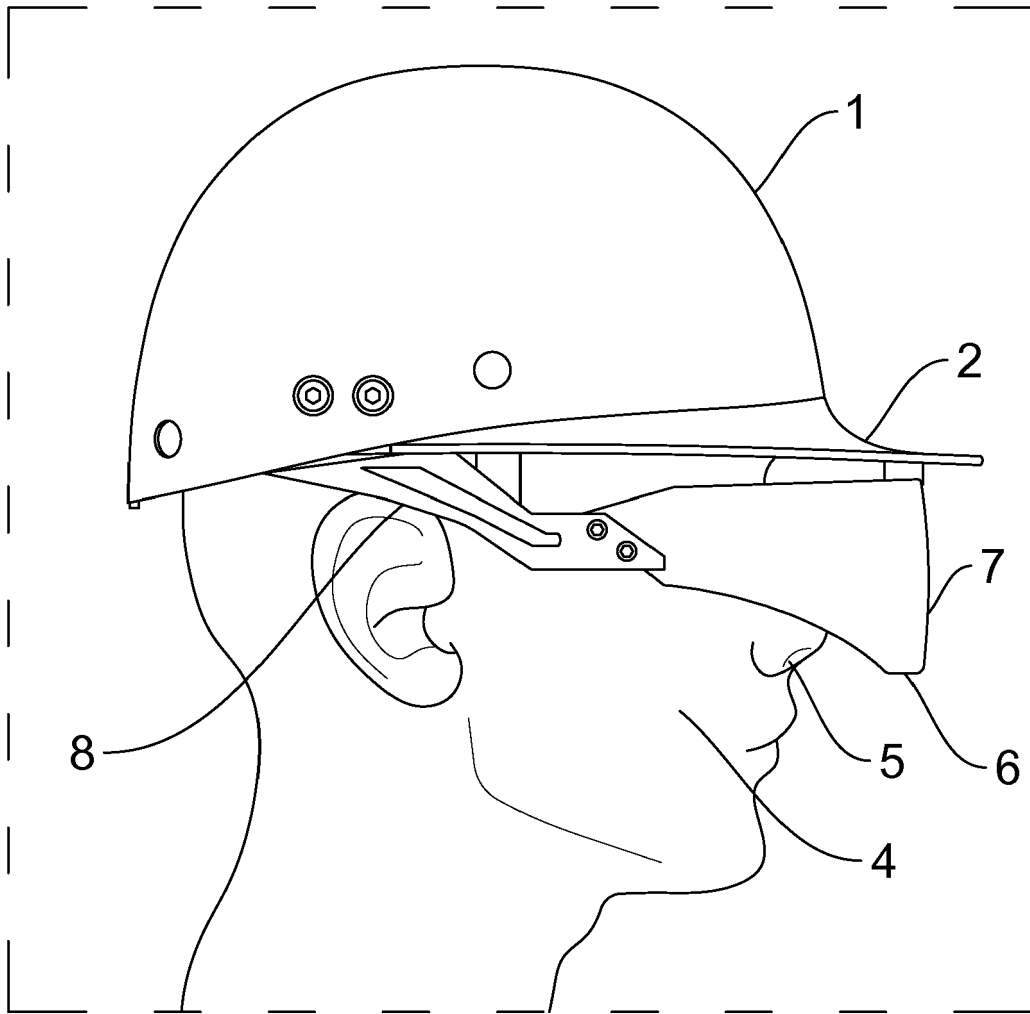


FIG. 6



EUROPEAN SEARCH REPORT

Application Number  
EP 19 42 5012

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
The Hague		8 August 2019	D'Souza, Jennifer
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

EPO FORM 1503 03/82 (P04/C01)

ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 19 42 5012

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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