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(71) Applicant: **Nike Bauer Hockey Inc.**
St-Jérôme QC J7Y 5G2 (CA)

(72) Inventors:
- **Durocher, Jacques**
  Quebec J7Y 4M1 (CA)
- **Généreux, Marie-Claude**
  Quebec J7E 5A8 (CA)
- **Laperrière, Jean-Francois**
  Quebec J0R 1T0 (CA)

(74) Representative: **Cabinet Plasseraud**
52 rue de la Victoire
75440 Paris Cedex 09 (FR)

(54) Face guard for a hockey helmet

(57) The invention provides a face guard for a hockey helmet. The face guard comprises a contour wire and a plurality of wires made of stainless steel. The plurality of wires are arranged as a curved grid having a concave side for facing a face of a wearer, the plurality of wires comprising first, second, third and fourth vertical wires intersecting first and second horizontal wires, each of the first, second, third and fourth vertical wires and first and second horizontal wires having a portion to be at least partially located within a field of view of the eyes of the wearer, each of the first, second, third and fourth vertical wires and first and second horizontal wires having an inner surface facing the face of the wearer and an outer surface opposing the inner surface, wherein the inner surface is mat and the outer surface is shiny. Each of the first, second, third and fourth vertical wires and first and second horizontal wires has an elliptical cross-section with a major axis and a minor axis, the major axis being oriented to generally converge towards the eyes of the wearer, wherein a ratio of the minor axis to the major axis is between 0.4 and 0.8, and wherein the face guard weighs between 170 grams and 220 grams.

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Description

Field of the invention

[0001] The present invention relates to a face guard for a hockey helmet.

Background of the invention

[0002] A protective helmet is often used to protect a wearer's head during practice of a sport such as hockey, lacrosse, ringette, football and baseball. A protective helmet sometimes comprises a face guard for protecting a wearer's face against impact with an object such as a hockey implement (e.g. a stick, a bat, etc.), a puck, a ball, or any other object involved in a given sport.

[0003] One type of face guard is a wire face guard, which includes a series of horizontal and vertical wires defining a protective grid extending in front of the wearer's face. The wires are dimensioned and configured so as to prevent an object from passing through the protective grid and impacting the wearer's face. For instance, in hockey, the wires are dimensioned and configured so as to prevent a hockey stick blade or puck from passing through the protective grid and impacting the wearer's face.

[0004] Wires of existing face guards are typically made of steel and have a circular cross-section with a diameter sufficiently large to meet strength and impact resistance requirements established by standards organizations. However, this requirement placed on the diameter of wires negatively affects visibility of the wearer since it results in wires being more obstructive to vision.

[0005] There is therefore a need for a face guard providing improvements in terms of visibility of the wearer while still providing sufficient strength and impact resistance.

Summary of the invention

[0006] As embodied and broadly described therein, the invention provides a face guard for a hockey helmet. The face guard comprises a contour wire and a plurality of wires made of stainless steel. The plurality of wires are arranged as a curved grid having a concave side for facing a face of a wearer, the plurality of wires comprising first, second, third and fourth vertical wires intersecting first and second horizontal wires, each of the first, second, third and fourth vertical wires and first and second horizontal wires having a portion to be at least partially located within a field of view of the eyes of the wearer, each of the first, second, third and fourth vertical wires and first and second horizontal wires having an inner surface facing the face of the wearer and an outer surface opposing the inner surface, wherein the inner surface is mat and the outer surface is shiny.

[0007] The invention further provides a face guard for a hockey helmet. The face guard comprises a contour wire and a plurality of wires made of stainless steel. The plurality of wires are arranged as a curved grid having a concave side for facing a face of a wearer, the plurality of wires comprising first, second, third, fourth, fifth, sixth, seventh and eighth vertical wires intersecting first, second, third and fourth horizontal wires, each of the first, second, third and fourth vertical wires and first and second horizontal wires having a portion to be at least partially located within a field of view of the eyes of the wearer, each of the first, second, third and fourth vertical wires and first and second horizontal wires having an elliptical cross-section with a major axis and a minor axis, the major axis being oriented to generally converge towards the eyes of the wearer, wherein a ratio of the minor axis to the major axis is between 0.4 and 0.8, and wherein the face guard weighs between 170 grams and 220 grams.

[0008] The invention also provides a face guard for a hockey helmet. The face guard comprises a contour wire and at least six vertical wires intersecting at least four horizontal wires for defining a curved grid having a concave side for facing a face of a wearer, wherein each of the contour wire, six vertical wires and four horizontal wires is made of stainless steel and has an inner surface facing the face of the wearer and an outer surface opposing the inner surface, and wherein the inner surface is mat and the outer surface is shiny.

[0009] These and other aspects and features of the present invention will now become apparent to those of ordinary skill in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying drawings.

Brief description of the drawings

[0010] A detailed description of specific embodiments of the present invention is provided herein below, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a front elevational view of a helmet having a face guard in accordance with an embodiment of the present invention;

Figure 2 is a right side elevational view of the helmet and face guard of Figure 1;

Figure 3 is a perspective view of the face guard of Figure 1;

Figure 4 is a cross-sectional plan view of the helmet and face guard of Figure 2, taken along line 4-4;

Figure 5 is a cross-sectional elevational view of the helmet and face guard of Figure 1, taken along line 5-5;

Figure 6A is a diagrammatic representation of a cross-section of a wire of the face guard of Figure 1;

Figures 6B and 6C are cut away views of the wire of Figure 6A showing its inner surface, which is mate, and its outer surface, which is shiny;

Figure 7 is a diagrammatic representation illustrating that the wire of Figure 6A is less obstructive to vision along a first direction than along a second direction;

Figures 8A to 8C illustrate possible cross-section configurations for a wire of a face guard in accordance with other embodiments of the present invention; and

Figure 9 is a diagrammatic representation of a cross-section of a contour wire of the face guard of Figure 2, taken along line 9-9.

[0011] In the drawings, the embodiments of the invention are illustrated by way of examples. It is to be expressly understood that the description and drawings are only for the purpose of illustration and are an aid for understanding. They are not intended to be a definition of the limits of the invention.

Detailed description of the embodiments

[0012] Figures 1 and 2 show a hockey helmet 10 to which is coupled a face guard 12 in accordance with an embodiment of the invention. The face guard 12 is for protecting the face of a wearer 14 against impact with a hockey stick blade or puck when the wearer 14 plays hockey.

[0013] Referring to Figures 1 to 5, the face guard 12 comprises a plurality of wires 16_1-16_{12} arranged as a grid and a contour wire 18. The grid may be a curved grid having a concave side for facing the face of the wearer 14. The wires 16_1-16_8 are generally vertical, the wires 16_9-16_{12} are generally horizontal, and together they define a plurality of apertures 20, each sized and configured to prevent a hockey stick blade or a hockey puck from impacting the face of the wearer 14. The face guard 12 may be pivotally coupled to the hockey helmet 10 at an upper portion of the contour wire 18 and coupled to the hockey helmet 10 via adjustable straps 22. The face guard 12 may also be provided with a chin pad 23 for engaging the chin of the wearer 14 so as to fit comfortably over the face of the wearer 14.

[0014] The wires 16_1-16_{12} and the contour wire 18 are made of stainless steel (e.g. SAE grade 304 or 316) and may be interconnected to each other via welding. The wires 16_1-16_{12} and the contour wire 18 are formed, for example, by bending, to provide a concave side to the face guard 12 such that the face guard 12 is spaced apart from the face of the wearer 14.

[0015] As best shown in Figures 3, 6A, 6B, and 6C, each of the wires 16_1-16_{12} has an inner surface 24 facing the face of the wearer and an outer surface 26 opposing the inner surface 24. While the inner surface 24 is mat in order to improve the vision of the wearer by absorbing light or reducing the glare from lighting, the outer surface 26 is shiny in order to create a metallic surface contrast between the outer surface 26 and the inner surface 24 and to render the face guard more visually appealing. To obtain an outer surface having a shiny aspect, the outer surfaces of the wires can be polished, shined or buffed. That is, a treatment can be performed on the outer surfaces of the wires to make them shiny, while no such treatment is performed on the inner surface of these wires, which remains mat. It is understood that the inner surface 24 is mat and the outer surface 26 is shiny in a permanent fashion after construction of the face guard is completed. Because no paint is applied to the wires, the face guard may be slightly lighter and may not be subject to chipping that usually occurs when objects such as hockey stick blades, blades or pucks impact the guard.

[0016] As described below, the wires 16_1-16_{12} may also be configured and dimensioned so as to provide optimal visibility to the wearer 14, while providing sufficient strength and rigidity for impact resistance.

[0017] As best seen in Figures 4 to 6A, each of the vertical wires 16_3, 16_4, 16_5, 16_6 and horizontal wires 16_{10}, 16_{11} has a cross-section with a periphery P_i having a first maximal dimension D_i in a first direction and a second maximal dimension d_i in a second direction intersecting the first direction (where i = 3, 4, 5, 6, 10 or 11). The second direction may intersect the first direction at an angle of 90°. It should be understood that the second direction may intersect the first direction at an angle between 70° and 120° depending of the shape of the wire. For a given wire 16_i, the second maximal dimension d_i is less than the first maximal dimension D_i such that the given wire 16_i is less obstructive to vision along the first direction than along the second direction. That is, as shown in Figure 7, if the given wire 16_i is viewed along the first direction and an object O is located at a location L_1 behind the given wire 16_i and intersecting the first direction, a greater portion of the object O will be visible than if the given wire 16_i is viewed along the second direction and the object O is located at a location L_2 behind the given wire 16_i and intersecting the second direction.

[0018] In the embodiment shown in Figures 1 to 6C, the periphery P_i of a given wire 16_i is an ellipse (i.e. the wire has an elliptical cross-section), the first maximal dimension D_i being the major axis of the ellipse and the second maximal dimension d_i being the minor axis of the ellipse. In other embodiments, the periphery P_i of a given wire 16_i may have various other non-elliptical configurations. Figures 8A to 8C illustrate examples of possible non-elliptical configurations for the periphery P_i of a given wire 16_i, which may be curved or polygonal, as well as the first maximal dimension D_i and the second maximal dimension d_i in each case.

[0019] A ratio d_i/D_i between 0.4 and 0.8 has been found advantageous. A ratio d_i/D_i between 0.5 and 0.7 has been found particularly advantageous. However, it should be understood that, generally, any ratio d_i/D_i less than one

may be envisaged without departing from the scope of the invention. The first maximal dimension D_i may be between 3.4 mm and 4.4 mm while the second maximal dimension d_i may be between 1.8 mm and 2.8 mm.

[0020] Reverting to Figures 1 to 5, each of the wires 16_3-16_6 and 16_{10}-16_{11} has an elliptic periphery P_i and at least a portion located in a field of view of the wearer 14. To achieve optimal visibility for the wearer 14, the major axis D_i of the periphery P_i of a given wire 1 6_1 may be aligned with a line of sight of the wearer 14 when directly looking at that given wire 16_i. However, this may not always be achievable since different wearers may have different lines of sight for the same given wire 16_i. Therefore, to accommodate different wearers, the wires 16_3-16_6 and 16_{10}-16_{11} are oriented such that their respective major axes generally converge towards the approximate location of the eyes of a wearer when he/she wears a hockey helmet with the face guard 12.

[0021] Each of the wires vertical wires 16_1, 16_2, 16_7, 16_8 and horizontal wires 16_9, 16_{12} may also have a cross-section with a periphery P_i having a first maximal dimension D_i in a first direction and a second maximal dimension d_i in a second direction intersecting the first direction (where i = 1, 2, 7, 8, 9 and 12). For a given wire 16_i, the second maximal dimension d_i is less than the first maximal dimension D_i such that the given wire 16_i is less obstructive to vision along the first direction than along the second direction. In the embodiment shown in Figures 1 to 6C, the periphery P_i of a given wire 16_i is an ellipse, the first maximal dimension D_i being the major axis of the ellipse and the second maximal dimension d_i being the minor axis of the ellipse. A ratio d_i/D_i between 0.4 and 0.8 has been found advantageous. A ratio d_i/D_i between 0.5 and 0.7 has been found particularly advantageous. However, it should be understood that, generally, any ratio d_i/D_i less than one may be envisaged without departing from the scope of the invention. The first maximal dimension D_i may be between 3.4 mm and 4.4 mm while the second maximal dimension d_i may be between 1.8 mm and 2.8 mm.

[0022] As best seen in Figure 9, the contour wire 18 may have a peripheral wall 28 defining a hollow interior 30 and a circular periphery with a diameter between 2.8 mm and 3.2 mm. The thickness of the peripheral wall may be between 0.6 mm and 1.0 mm.

[0023] It will thus be appreciated that the wires 16_1-16_{12} of the face guard 12 are configured and dimensioned so as to provide benefits in terms of visibility to the wearer 14 and weight of the face guard 12, without compromising rigidity and strength for impact resistance.

[0024] In this regard, for a face guard made of stainless steel and having (i) a contour wire with a diameter of 3.2 mm and a peripheral wall 28 defining a hollow interior and having a thickness of 0.8 mm; and (ii) eight (8) vertical wires (e.g. 16_1-16_8) and four (4) horizontal wires (e.g. 16_9-16_{12}), each having an elliptical cross-section with a minor axis of between 1.8 mm and 2.8 mm and a major axis between 3.4 mm and 4.4 mm, it is possible to make such face guard such that it weighs between 170 grams and 220 grams. Moreover, vertical and/or horizontal wires having an elliptical cross-section and vertical and/or horizontal wires having a peripheral wall defining a hollow interior, can also be used in combination in order to obtain a face guard of stainless steel that weighs between 170 grams and 220 grams. For example, in the above embodiment, the wires 16_3-16_6 and 16_{10}, 16_{11} can have an elliptical cross-section while the wires 16_1, 16_2, 16_7, 16_8, 16_9, 16_{12} and the contour wire 18 may have a peripheral wall defining a hollow interior.

[0025] Although in the embodiment shown in Figures 1 to 5, the face guard 12 comprises one contour wire and twelve (12) wires defining the grid, it is to be understood that, in other embodiments, the face guard 12 may comprise one contour wire and eleven (11) or thirteen (13) wires without departing from the scope of the invention. A person skilled in the art will appreciate that the number and configuration of the wires must be selected for defining a grid that will prevent a hockey stick blade or puck from impacting the face of the wearer 14 and that will resist impact/penetration tests such as CAN/CSA-Z262.2-M90.

[0026] Although various embodiments have been illustrated, this was for the purpose of describing, but not limiting, the invention. Various modifications will become apparent to those skilled in the art and are within the scope of the present invention, which is defined more particularly by the attached claims.

Claims

1. A face guard (12) for a hockey helmet, said face guard comprising a contour wire (18) and a plurality of wires made of stainless steel, said plurality of wires being arranged as a curved grid having a concave side for facing a face of a wearer, said plurality of wires comprising first, second, third and fourth vertical wires (16_3, 16_4, 16_5, 16_6) intersecting first and second horizontal wires (16_{10}, 16_{11}), each of said first, second, third and fourth vertical wires and first and second horizontal wires having a portion to be at least partially located within a field of view of the eyes of the wearer, each of said first, second, third and fourth vertical wires and first and second horizontal wires having an inner surface (24) facing the face of the wearer and an outer surface (26) opposing said inner surface, said face guard being **characterized in that** said inner surface is mat and said outer surface is shiny.

2. A face guard as defined in claim 1, wherein each of said first, second, third and fourth vertical wires and first and second horizontal wires has a cross-section with a periphery having a respective first maximal dimension in a respective first direction and a respective second maximal dimension in a respective

second direction intersecting the first direction and wherein said first maximal dimension is greater than said second maximal dimension.

3. A face guard as defined in claim 2, wherein said second maximal dimension is between 1.8 mm and 2.8 mm and said first maximal dimension is between 3.4 mm and 4.4 mm.

4. A face guard as defined in claim 2, wherein a ratio of said second maximal dimension to said first maximal dimension is between 0.4 and 0.8.

5. A face guard as defined in claim 1, wherein each of said first and second horizontal wires has an elliptical cross-section with a major axis and a minor axis, and wherein said first and second horizontal wires are oriented such that their respective major axes generally converge towards the eyes of the wearer.

6. A face guard as defined in claim 3, wherein said plurality of wires comprises third and fourth horizontal wires (16_9, 16_{12}) intersecting said first, second, third and fourth vertical wires (16_3, 16_4, 16_5, 16_6), wherein each of said third and fourth horizontal wires has a cross-section with a periphery having a respective first maximal dimension in a respective first direction and a respective second maximal dimension in a respective second direction intersecting the first direction, said second maximal dimension of each of said third and fourth horizontal wires being between 1.8 mm and 2.8 mm and said first maximal dimension of each of said third and fourth horizontal wires being between 3.4 mm and 4.4 mm.

7. A face guard as defined in claim 6, wherein each of said first, second, third and fourth horizontal wires has an elliptical cross-section with a major axis and a minor axis, and wherein said first, second, third and fourth horizontal wires are oriented such that their respective major axes generally converge towards the eyes of the wearer.

8. A face guard as defined in claim 6, wherein said plurality of wires comprises fifth and sixth vertical wires (16_2, 16_7) intersecting said first, second, third and fourth horizontal wires, wherein each of said fifth and sixth wires has a cross-section with a periphery having a respective first maximal dimension in a respective first direction and a respective second maximal dimension in a respective second direction intersecting the first direction, said second maximal dimension of each of said fifth and sixth wires being between 1.8 mm and 2.8 mm and said first maximal dimension of each of said fifth and sixth wires being between 3.4 mm and 4.4 mm.

9. A face guard as defined in claim 3, wherein said face guard further comprises fifth, sixth, seventh and eighth vertical wires (16_1, 16_2, 16_7, 16_8) and third horizontal wire (16_9) and weighs between 170 grams and 220 grams.

10. A face guard as defined in claim 9, further comprising a fourth horizontal wire (16_{12}).

11. A face guard as defined in claim 8, wherein said contour wire (18) has a peripheral wall (28) defining a hollow interior (30), said peripheral wall having a thickness between 0.6 mm and 1.0 mm.

12. A face guard as defined in claim 11, wherein said contour wire (18) has a circular periphery with a diameter between 2.8 mm and 3.2 mm.

13. A face guard as defined in claim 12, wherein said face guard weighs between 170 grams and 220 grams.

14. A face guard as defined in claim 1, wherein said face guard further comprises fifth, sixth, seventh and eighth vertical wires (16_1, 16_2, 16_7, 16_8) and third and fourth horizontal wires (16_9, 16_{12}), each of said fifth, sixth, seventh and eighth vertical wires and third and fourth horizontal wires having an inner surface (24) facing the face of the wearer and an outer surface (26) opposing said inner surface, wherein said inner surface of said fifth, sixth, seventh and eighth vertical wires and third and fourth horizontal wires is mat and said outer surface of said fifth, sixth, seventh and eighth vertical wires and third and fourth horizontal wires is shiny.

15. A face guard for a hockey helmet, said face guard comprising a contour wire (18) and a plurality of wires made of stainless steel, said plurality of wires being arranged as a curved grid having a concave side for facing a face of a wearer, said plurality of wires comprising first, second, third, fourth, fifth, sixth, seventh and eighth vertical wires (16_1, 16_2, 16_3, 16_4, 16_5, 16_6, 16_7, 16_8) intersecting first, second, third and fourth horizontal wires (16_9, 16_{10}, 16_{11}, 16_{12}), each of said first, second, third and fourth vertical wires and first and second horizontal wires having a portion to be at least partially located within a field of view of the eyes of the wearer, said face guard being **characterized in that** each of said first, second, third and fourth vertical wires and first and second horizontal wires has an elliptical cross-section with a major axis and a minor axis, said major axis being oriented to generally converge towards the eyes of the wearer, wherein a ratio of said minor axis to said major axis is between 0.4 and 0.8, and wherein said face guard weighs between 170 grams and 220 grams.

16. A face guard as defined in claim 15, wherein each

of said third and fourth horizontal wires (16_{10}, 16_{11}) has an elliptical cross-section with a maj or axis and a minor axis, said major axis of each of said third and fourth horizontal wires being oriented to generally converge towards the eyes of the wearer, and wherein a ratio of said minor axis of each of said third and fourth horizontal wires to said major axis of each of said third and fourth horizontal wires is between 0.4 and 0.8.

17. A face guard as defined in claim 16, wherein said contour wire (18) has a peripheral wall (28) defining a hollow interior (30), said peripheral wall having a thickness between 0.6 mm and 1.0 mm.

18. A face guard as defined in claim 17, wherein said contour wire (18) has a circular periphery with a diameter between 2.8 mm and 3.2 mm.

19. A face guard as defined in claim 15, wherein each of said first, second, third, fourth, fifth, sixth, seventh and eighth vertical wires and first, second, third and fourth horizontal wires has an inner surface (24) facing the face of the wearer and an outer surface (28) opposing said inner surface, said inner surface being mat and said outer surface being shiny.

20. A face guard as defined in claim 19, wherein each of said third and fourth horizontal wires (16_{10}, 16_{11}) has an elliptical cross-section with a major axis and a minor axis, said major axis of each of said third and fourth horizontal wires being oriented to generally converge towards eyes of the wearer, and wherein a ratio of said minor axis of each of said third and fourth horizontal wires to said major axis of each of said third and fourth horizontal wires is between 0.4 and 0.8.

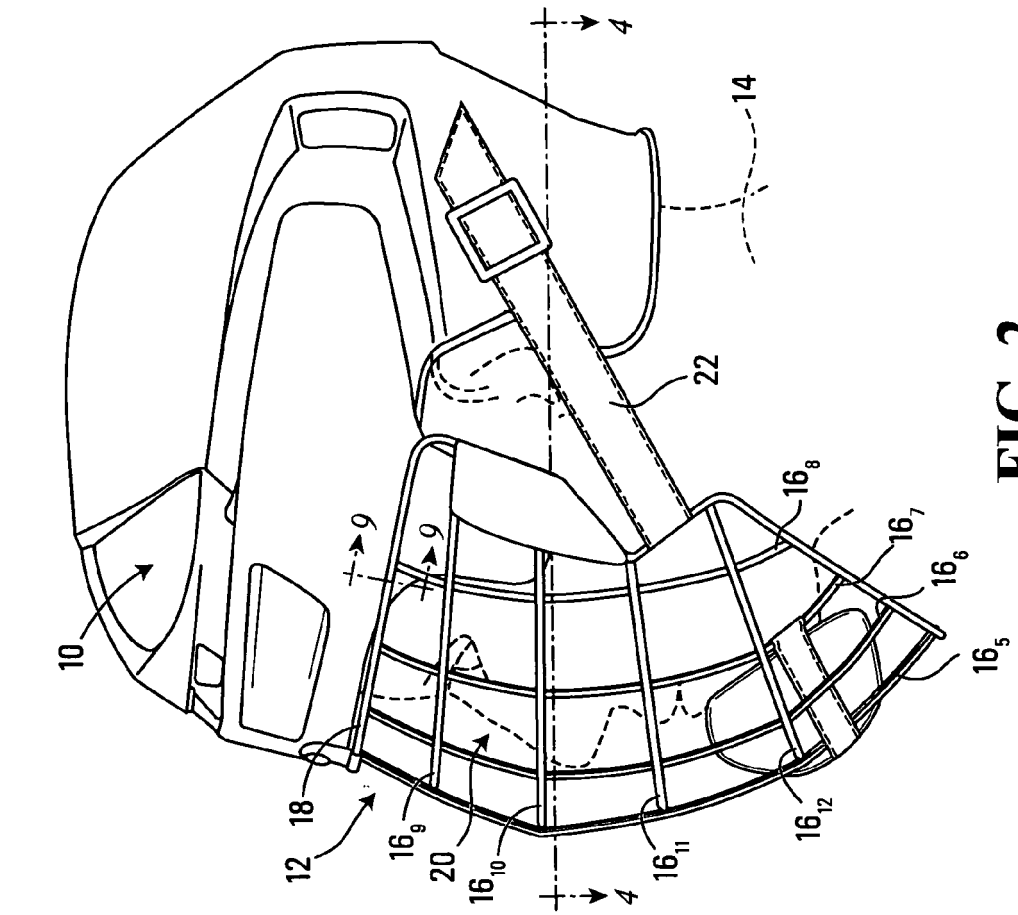
21. A face guard as defined in claim 20, wherein said contour wire (18) has a peripheral wall (28) defining a hollow interior (30), said peripheral wall having a thickness between 0.6 mm and 1.0 mm.

22. A face guard as defined in claim 21, wherein said contour wire (18) has a circular periphery with a diameter between 2.8 mm and 3.2 mm.

23. A face guard for a hockey helmet, said face guard comprising a contour wire (18) and at least six vertical wires intersecting at least four horizontal wires for defining a curved grid having a concave side for facing a face of a wearer, wherein each of said contour wire, six vertical wires and four horizontal wires is made of stainless steel and has an inner surface (24) facing the face of the wearer and an outer surface (26) opposing said inner surface, said face guard being **characterized in that** said inner surface is mat and said outer surface is shiny.

24. A face guard as defined in claim 23, wherein said at least six vertical wires comprise first, second, third, fourth, fifth, sixth vertical wires (16_1, 16_2, 16_3, 16_4, 16_5, 16_6) and said at least four horizontal wires comprise first, second, third and fourth horizontal wires (16_9, 16_{10}, 16_{11}, 16_{12}), each of said first, second, third and fourth vertical wires and first and second horizontal wires having a portion to be at least partially located within a field of view of the eyes of the wearer, each of said first, second, third and fourth vertical wires and first and second horizontal wires having an elliptical cross-section with a major axis and a minor axis, said major axis being oriented to generally converge towards eyes of the wearer, wherein a ratio of said minor axis to said major axis is between 0.4 and 0.8, and wherein said face guard weighs between 170 grams and 220 grams.

25. A face guard as defined in claim 24, wherein said contour wire (18) has a peripheral wall (28) defining a hollow interior (30), said peripheral wall having a thickness between 0.6 mm and 1.0 mm.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9
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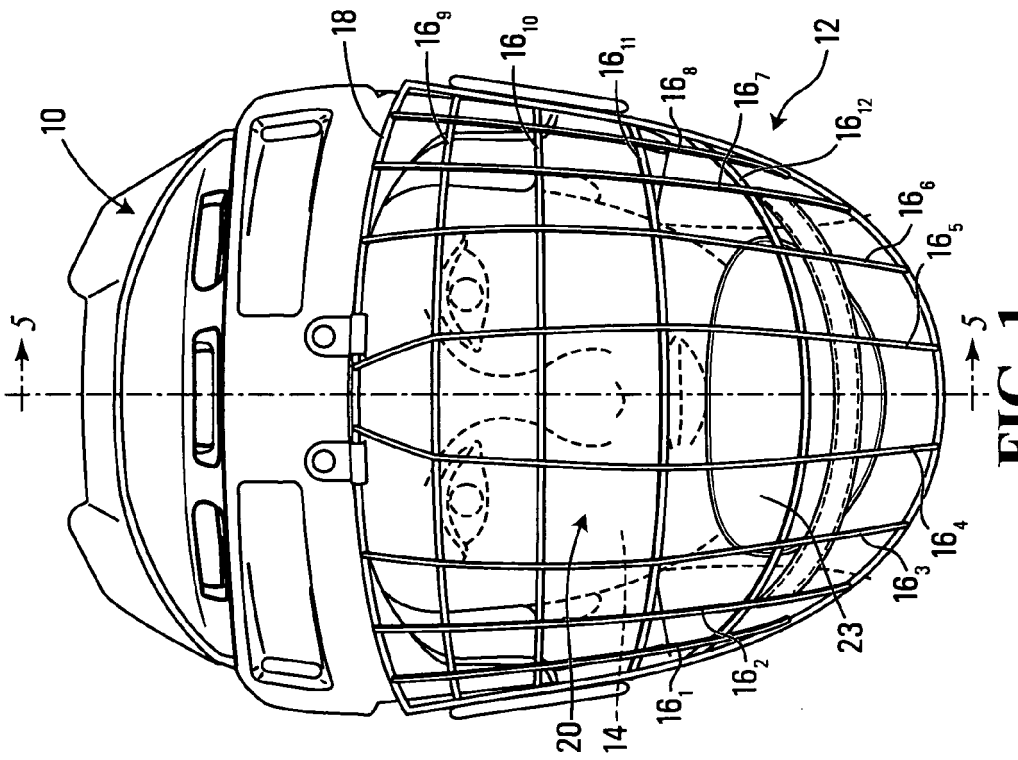
16_5
4

FIG. 2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16_8
16_7
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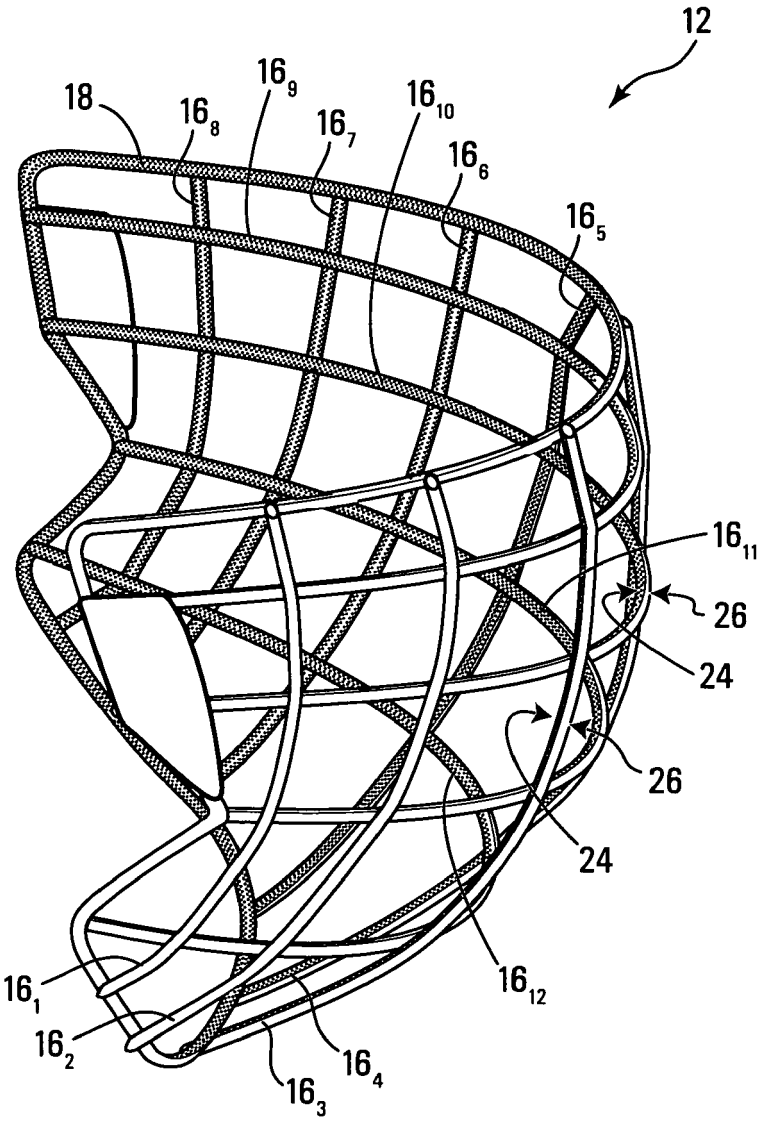
16_3
23
16_2
16_1
20
14

FIG. 1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16 8
16 9
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16 12

FIG. 3

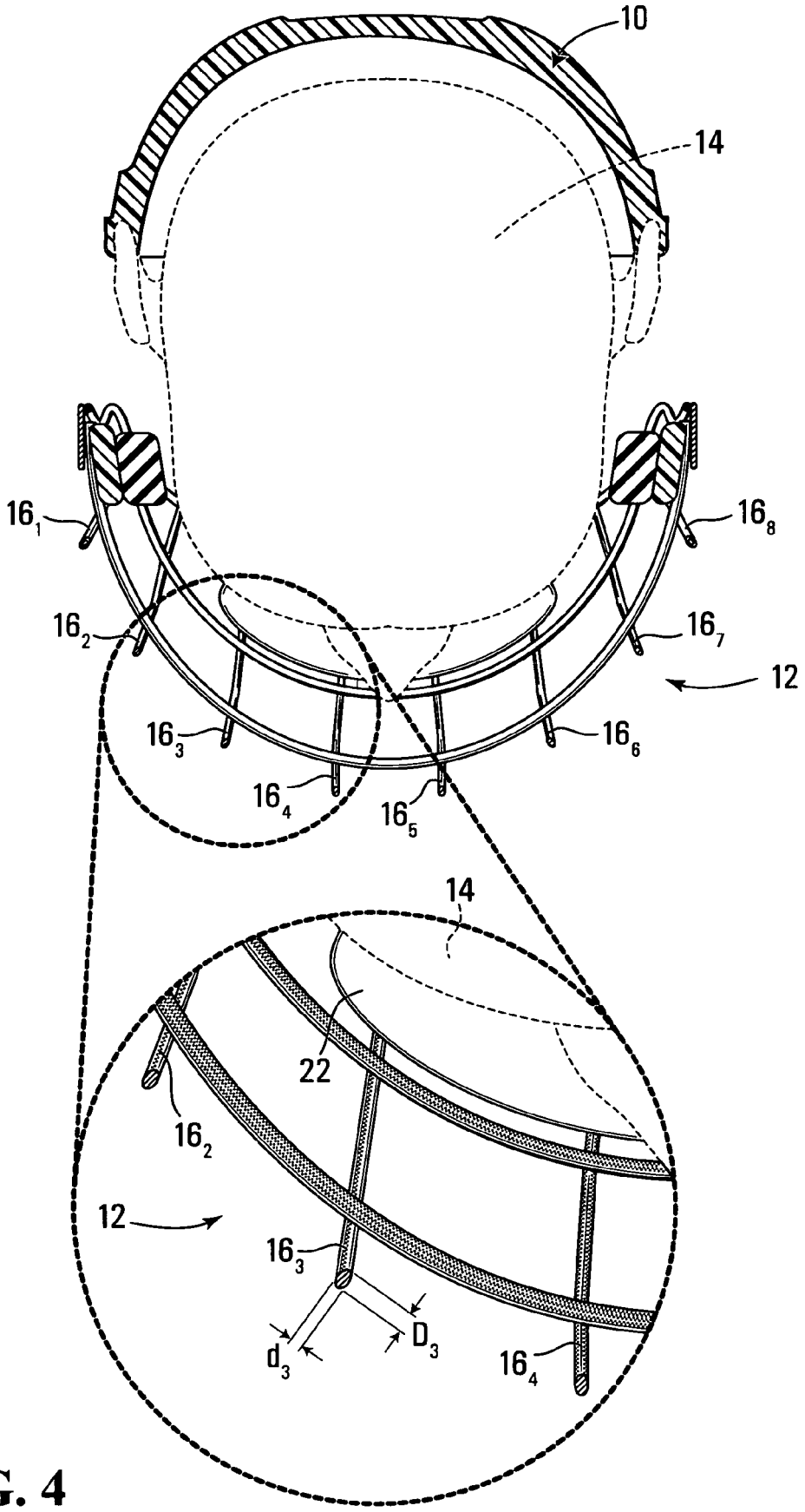
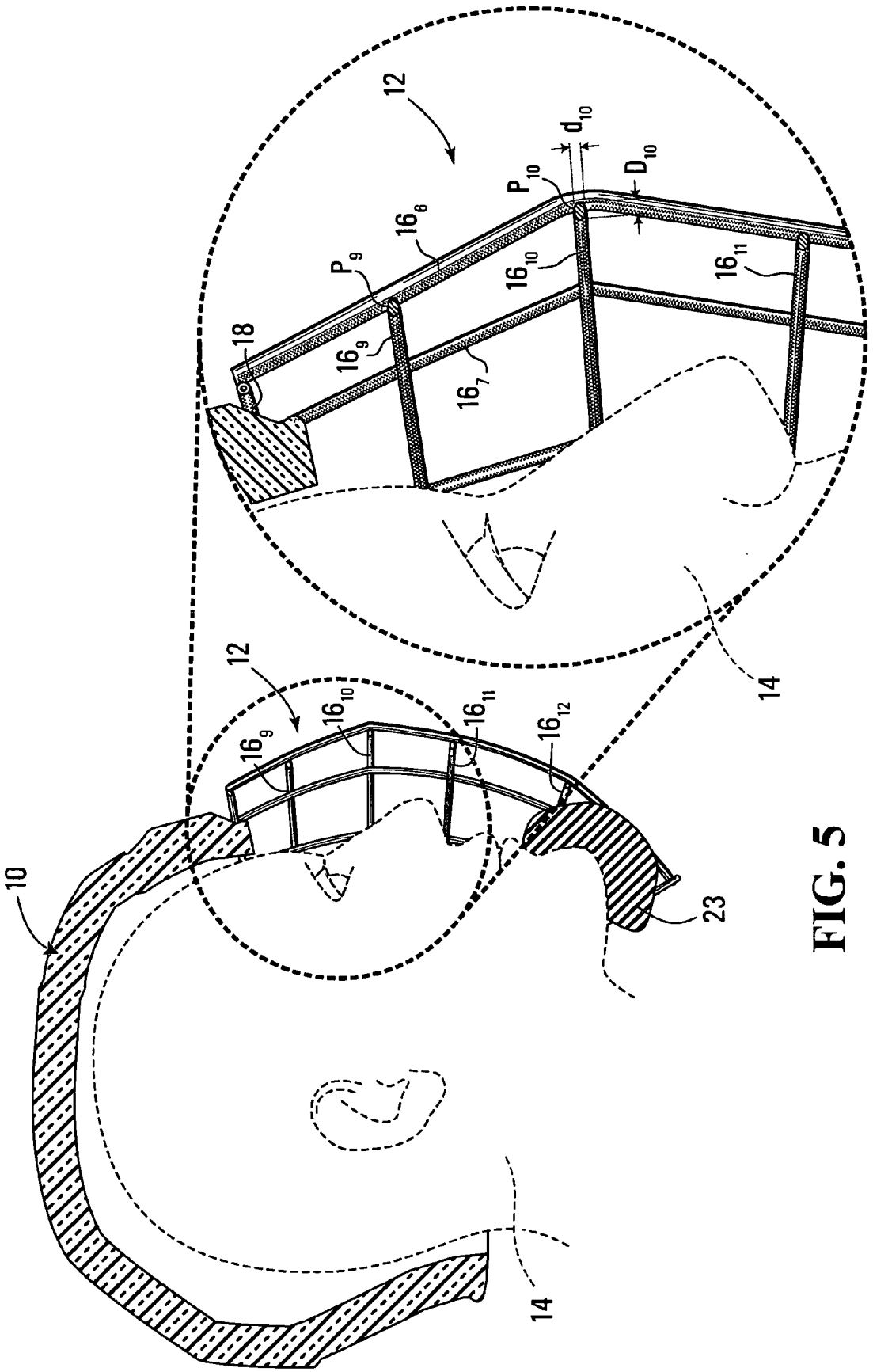


FIG. 4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16_6
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23
14

FIG. 5

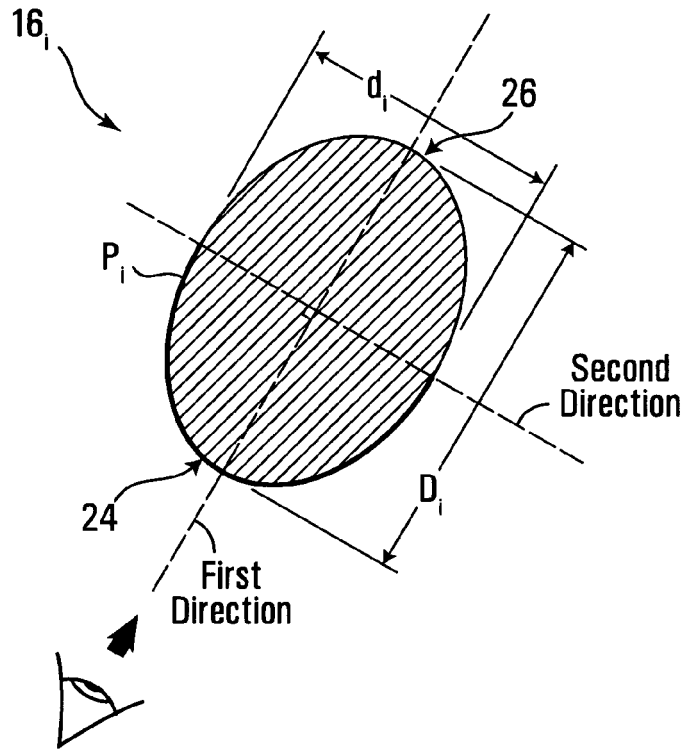

FIG. 6A

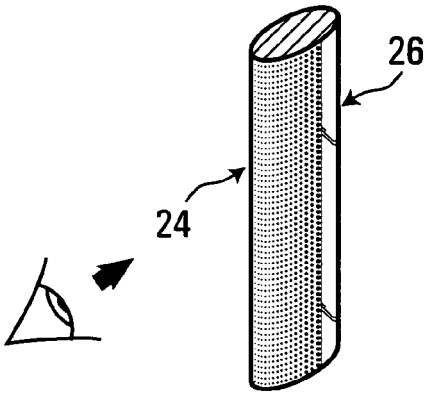

FIG. 6B

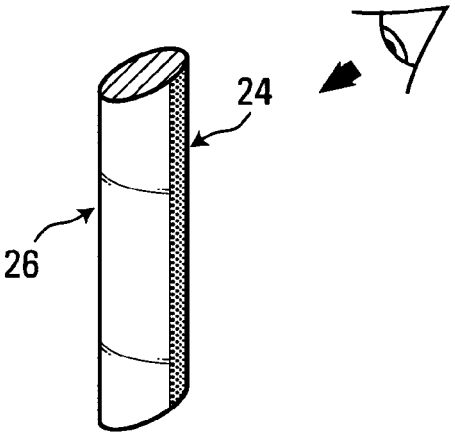

FIG. 6C

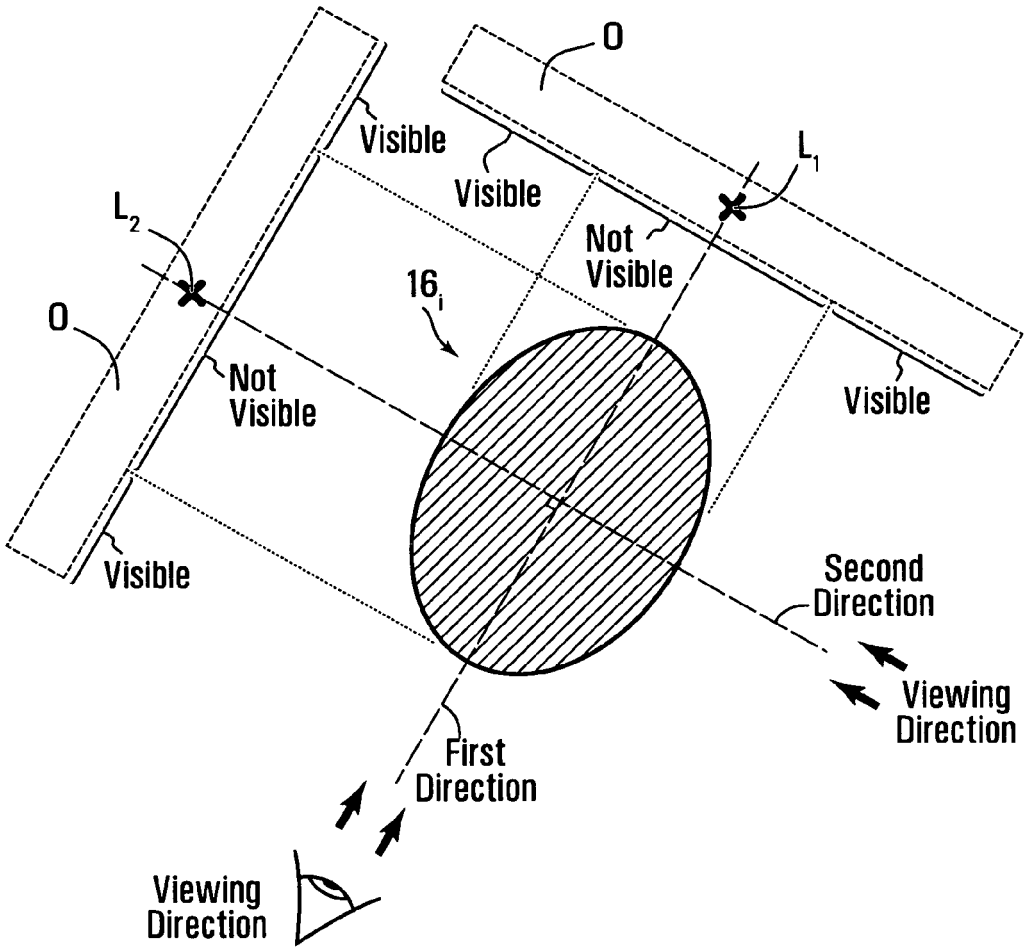
O
Visible
Visible
L_1
L_2
Not
Visible
16_i
O
Not
Visible
Visible
Visible
Second
Direction
Viewing
Direction
First
Direction
Viewing
Direction

FIG. 7

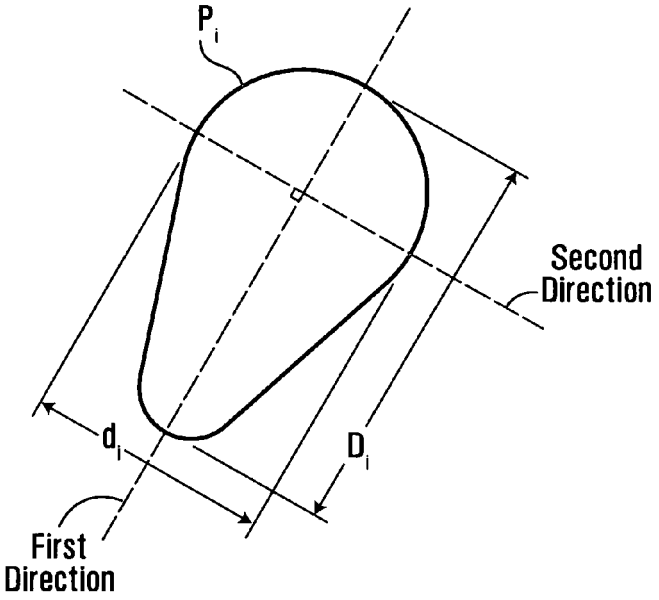

FIG. 8A

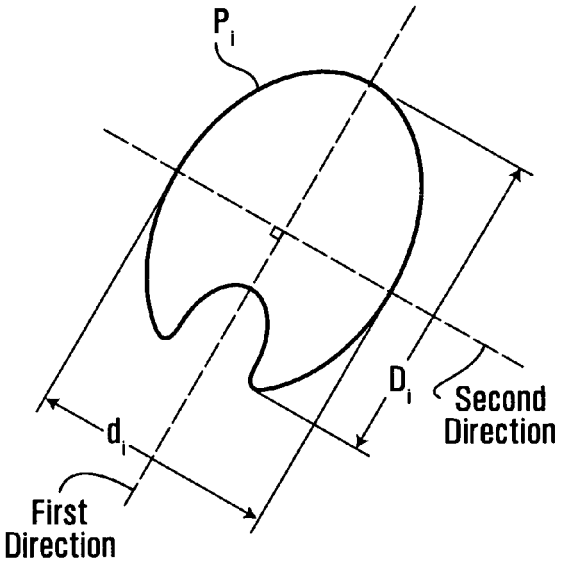

FIG. 8B

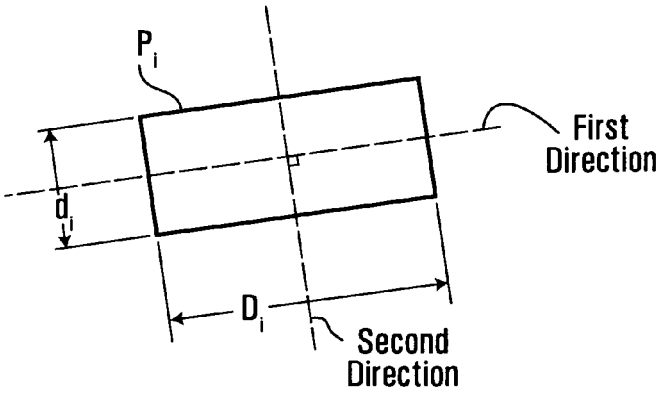

FIG. 8C

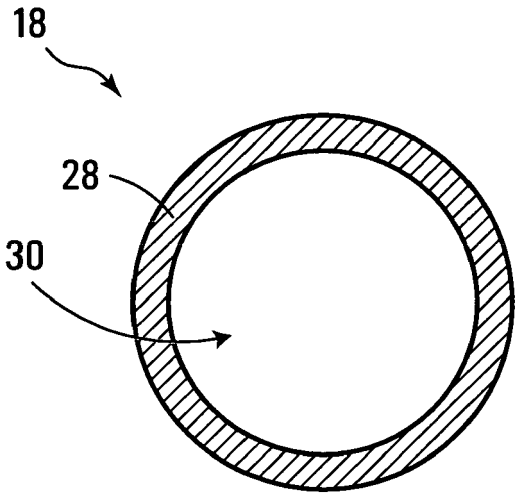

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 07 29 0384

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 6 338 165 B1 (BIONDICH PAUL TIMOTHY [CA]) 15 January 2002 (2002-01-15) * column 3, line 16 - column 4, line 22; claim 1; figures 1-3 *	1,14,23	INV. A42B3/20
X	CA 2 517 417 A1 (BAUER NIKE HOCKEY INC [CA]) 26 February 2007 (2007-02-26)	15-22	
A	* the whole document *	2-13,24, 25	
A	WO 97/30606 A (PELTOR AB [SE]; NORDIN HENRIK [SE]) 28 August 1997 (1997-08-28) * page 7, line 21 - line 28 *	1,14,15, 23	
A	US 5 806 088 A (ZIDE ROBERT M [US] ET AL) 15 September 1998 (1998-09-15) * claim 1; figure 1 *	1,15,23	
A	US 5 249 347 A (MARTINITZ FRANZ W [CA]) 5 October 1993 (1993-10-05) * column 3, line 27 - line 30; claim 1; figure 1 *	1,15,23	TECHNICAL FIELDS SEARCHED (IPC) A42B A61F
A	US 2003/070201 A1 (MCCLELLAND JIM [CA]) 17 April 2003 (2003-04-17) * paragraph [0030]; figure 2 *	1,15,23	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 August 2007	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
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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 (P04C01)

European Patent Office

Application Number
EP 07 29 0384

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☒ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

European Patent Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 07 29 0384

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-14,23-25

A faceguard for a hockey helmet comprising vertical and horizontal stainless steel wires, said wires having a mat inner surface and a shiny outer surface.

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2. claims: 15-22

A faceguard for a hockey helmet comprising vertical and horizontal stainless steel wires, said wires having an elliptical cross-section and weighing between 170 - 220 grams.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 29 0384

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-08-2007

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82