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(54) **IMPROVED MULTI-LAYER SAFETY HELMET**

(57) Disclosed is an improved multi-layer safety helmet comprising:

- a lower buffer portion worn on the user's head; and
- an upper buffer portion coupled to an upper portion of

the lower buffer portion,
wherein an impact applied from the outside is firstly absorbed by the upper buffer portion and is secondly absorbed by the lower buffer portion.

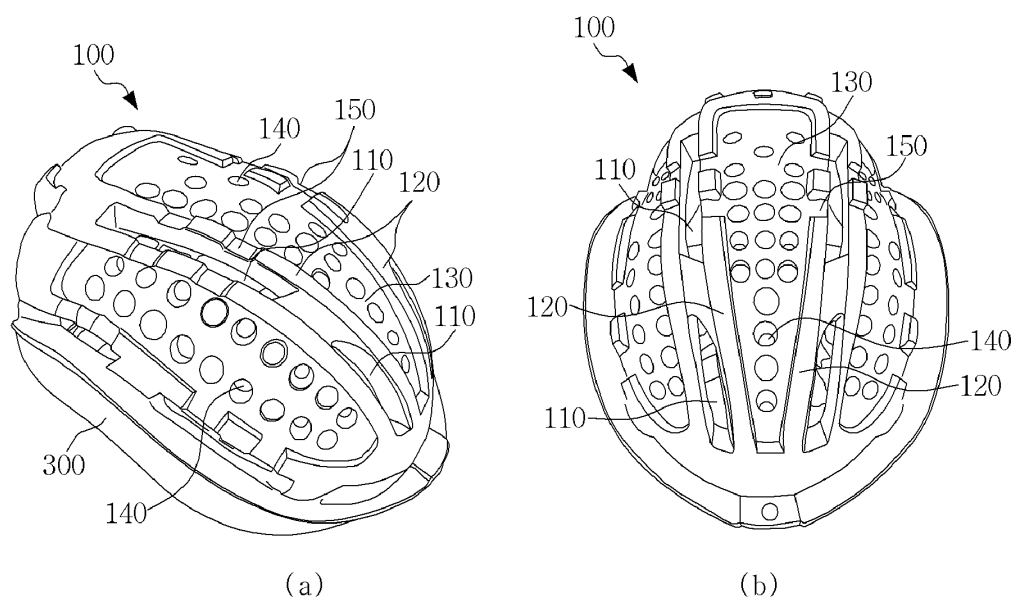


Fig. 1

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Description

Technical Field:

[0001] The present invention relates to an improved multi-layer safety helmet that protects the head by dispersing the impact energy of an external impact to prevent the impact energy from being transferred to the head when a user wears the helmet on the head and is lightweight and well ventilated.

Background Art:

[0002] Users of bicycles and motorcycles are required to wear helmets. In the case of a conventional helmet, it has been pointed out that there is a limit in protecting a user because a buffer material has one layer.

[0003] Accordingly, the inventor of the present invention has developed an improved multi-layer safety helmet according to the present invention that consists of two or more layers of a buffer material and forms a buffer space between the layers such that the outermost layer absorbs the impact in order to minimize the transfer of impact to an inner layer.

Disclosure of Invention:

Technical Problem:

[0004] Therefore, the present invention has been made in view of the above problems, and it is an object of the present invention to provide an improved multi-layer safety helmet that consists of two or more layers of a buffer material and forms a buffer space between the layers, such that the outermost layer absorbs a first impact and distributes the impact in the buffer space before transferring the impact to an inner layer, and then transfers the minimized impact to the inner layer.

Technical Solution:

[0005] To accomplish the above object, according to one aspect of the present invention, there is provided an improved multi-layer safety helmet comprising:

- a lower buffer portion worn on the user's head; and
- an upper buffer portion coupled to an upper portion of the lower buffer portion,

wherein an impact applied from the outside is firstly absorbed by the upper buffer portion and is secondly absorbed by the lower buffer portion.

Advantageous Effects:

[0006] According to the present invention, provided is an improved multi-layer safety helmet that consists of two or more layers of a buffer material and forms a buffer

space between the layers, such that the outermost layer absorbs a first impact and distributes the impact in the buffer space before transferring the impact to an inner layer, and then transfers the minimized impact to the inner layer.

Brief Description of the Drawings:

[0007]

FIG. 1 is a view showing a lower buffer portion viewed from the top according to the present invention;

FIG. 2 is a view showing an upper buffer portion viewed from the top according to the present invention;

FIG. 3 is a view showing FIG. 2 viewed from the bottom;

FIG. 4 is a view showing an improved multi-layer safety helmet of the present invention in which a lower buffer portion and an upper buffer portion are combined according to the present invention;

FIG. 5 is an enlarged view of a dotted line in FIG. 4;

FIG. 6 is another embodiment of FIG. 4; and

FIG. 7 is a schematic diagram of an impact energy dispersion process according to the present invention.

Best Mode for Carrying out the Invention:

[0008] In an embodiment of the present invention, an improved multi-layer safety helmet comprising:

- a lower buffer portion 100 worn on the user's head; and
- an upper buffer portion 200 coupled to an upper portion of the lower buffer portion 100, wherein an impact applied from the outside is firstly absorbed by the upper buffer portion 200 and is secondly absorbed by the lower buffer portion 100.

[0009] Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0010] FIG. 1 is a view showing a lower buffer portion viewed from the top according to the present invention.

[0011] FIG. 2 is a view showing an upper buffer portion viewed from the top according to the present invention.

[0012] FIG. 3 is a view showing FIG. 2 viewed from the bottom.

[0013] The improved multi-layer safety helmet of the present invention comprises:

- a lower buffer portion 100 worn on the user's head; and
- an upper buffer portion 200 coupled to an upper portion of the lower buffer portion 100,

wherein an impact applied from the outside is firstly absorbed by the upper buffer portion 200 and is secondly absorbed by the lower buffer portion 100.

[0014] Moreover, a frame 300 is integrally coupled to the lower buffer portion 100.

[0015] A frame 400 is integrally coupled to the upper buffer portion 200.

[0016] In addition, a lower slot 110 and an upper slot 210 are formed in the lower buffer portion 100 and the upper buffer portion 200, respectively, such that the lower slot 110 and the upper slot 210 vertically extend to form a vent and are coupled to each other.

[0017] Specifically, it is as follows:

The lower buffer portion 100 is made of a lightweight material such as EPS, EPP, PU, EPU, EVA, etc. that absorbs an impact, and is preferably extruded and molded.

[0018] The frame 300 which is an outer shell made of synthetic resin wraps around front and side surfaces of the lower buffer portion 100 and is adhered and coupled thereto.

[0019] A plurality of lower coupling portions 120 protruding are formed on an upper surface of the lower buffer portion 100.

[0020] A level down portion 130 is formed between the plurality of lower coupling portions 120.

[0021] In addition, a plurality of hollows are perforated in the level down portion 130 to form a vertical vent 140 that discharges heat generated from the user's head and introducing fresh air from the outside.

[0022] The upper buffer portion 200 is made of a lightweight material that absorbs the impact in the same manner as the lower buffer portion 100.

[0023] The frame 400 which is an outer shell made of synthetic resin wraps around front and side surfaces of the upper buffer portion 200 and is adhered and coupled thereto.

[0024] A plurality of protruding upper coupling portions 220 are formed on the lower surface of the upper buffer portion 200.

[0025] A level down portion 230 is formed between the plurality of upper coupling portions 220.

[0026] FIG. 4 is a view showing an improved multi-layer safety helmet of the present invention in which a lower buffer portion and an upper buffer portion are combined according to the present invention.

[0027] FIG. 5 is an enlarged view of a dotted line in FIG. 4.

[0028] As shown in FIGS. 4 and 5, the lower slot 110 and the upper slot 210 extend vertically to form a ventilation hole through coupling of the lower buffer portion 100 and the upper buffer portion 200.

[0029] In addition, a level-down lower horizontal vent

150 is formed in the lower coupling portion 120, and a level-down upper horizontal vent 250 is also formed in the upper coupling portion 220, such that when the lower coupling portion 120 and the upper coupling portion 220 are coupled to each other, the lower horizontal vent 150 and the upper horizontal vent 250 are coupled to each other from the top and bottom at the same position to form one large vent.

[0030] Accordingly, an air passage that continues to the vertical vent 140, the level down portions 130 and 230, the lower horizontal vent 150 and the upper horizontal vent 250 may be formed, thereby ensuring user comfort.

[0031] FIG. 7 is a schematic diagram of an impact energy dispersion process according to the present invention.

[0032] In FIG. 7, a PC shell is the frame 400, an EPS means the upper buffer portion 200, and a buffer space means the level down portions 130 and 230.

[0033] Specifically, the most important feature of the present invention consists in that the upper buffer portion 200, which is the outermost layer, firstly absorbs an impact energy of the impact applied from the outside, the buffer space formed by the level down portions 130 and 230 disperses the impact energy, and the lower buffer portion 100, which is an inner layer, secondly absorbs the remaining impact energy that does not disperse.

[0034] In addition, a separate impact buffer material may be inserted or filled in the level down portions 130 and 230 on the premise of being lightweight. As the separate impact buffer material a material such as styrofoam may be used, and a gel-type impact buffer material or a viscoelastic impact buffer material may be inserted or filled.

[0035] When the lower coupling portion 120 and the upper coupling portion 220 are coupled to each other, a coupling means may use an adhesive material, and may be thermally fused according to the materials of the lower buffer portion 100 and the upper buffer portion 200.

[0036] Moreover, although not shown, when a hinge means or a detachment means is applied between the frame 300 and the frame 400, as a result, the lower buffer portion 100 and the upper buffer portion 200 may be configured to freely detach and attach for cleaning or parts replacement.

[0037] While the present invention has been described with reference to the preferred embodiments, the present invention is not limited to the embodiments, and various modifications may be made by those skilled in the art within the scope of the present invention.

Industrial Applicability:

[0038] The present invention is presented to solve the problems of the prior art as described above. It is an object of the present invention to provide an improved multi-layer safety helmet that consists of two or more layers of a buffer material and forms a buffer space be-

tween the layers, such that the outermost layer absorbs a first impact and distributes the impact in the buffer space before transferring the impact to an inner layer, and then transfers the minimized impact to the inner layer.

Claims

1. An improved multi-layer safety helmet comprising:
 - a lower buffer portion (100) worn on the user's head; and
 - an upper buffer portion (200) coupled to an upper portion of the lower buffer portion (100), wherein an impact applied from the outside is firstly absorbed by the upper buffer portion (200) and is secondly absorbed by the lower buffer portion (100),
 - wherein a lower slot (110) and an upper slot (210) are formed in the lower buffer portion (100) and the upper buffer portion (200), respectively, such that the lower slot (110) and the upper slot (210) vertically extend to form a vent and are coupled to each other,
 - wherein a plurality of lower coupling portions (120) protruding are formed on an upper surface of the lower buffer portion (100),
 - a level down portion (130) is formed between the plurality of lower coupling portions (120), and a plurality of hollows are perforated in the level down portion (130) to form a vertical vent (140) that discharges heat generated from a user's head and introducing fresh air from the outside,
 - wherein a plurality of protruding upper coupling portions (220) are formed on the lower surface of the upper buffer portion (200), and
 - a level down portion (230) is formed between the plurality of upper coupling portions (220), wherein the lower slot (110) and the upper slot (210) extend vertically to form a ventilation hole through coupling of the lower buffer portion (100) and the upper buffer portion (200),
 - wherein a level-down lower horizontal vent (150) is formed in the lower coupling portion (120), and a level-down upper horizontal vent (250) is also formed in the upper coupling portion (220),
 - such that when the lower coupling portion (120) and the upper coupling portion (22) are coupled to each other, the lower horizontal vent (150) and the upper horizontal vent (250) are coupled to each other from the top and bottom at the same position to form one large vent, and
 - wherein the upper buffer portion (200), which is an outermost layer, firstly absorbs an impact energy of an impact applied from the outside, a buffer space formed by the level down portions (130, 230) disperses the impact energy, and the

lower buffer portion (100), which is an inner layer, secondly absorbs a remaining impact energy that does not disperse.

2. The improved multi-layer safety helmet according to claim 1,

wherein a frame (300) is integrally bonded and coupled around front and side surfaces of the lower buffer portion (100), and wherein a frame (400) is integrally bonded to an upper surface of the upper buffer portion (200).

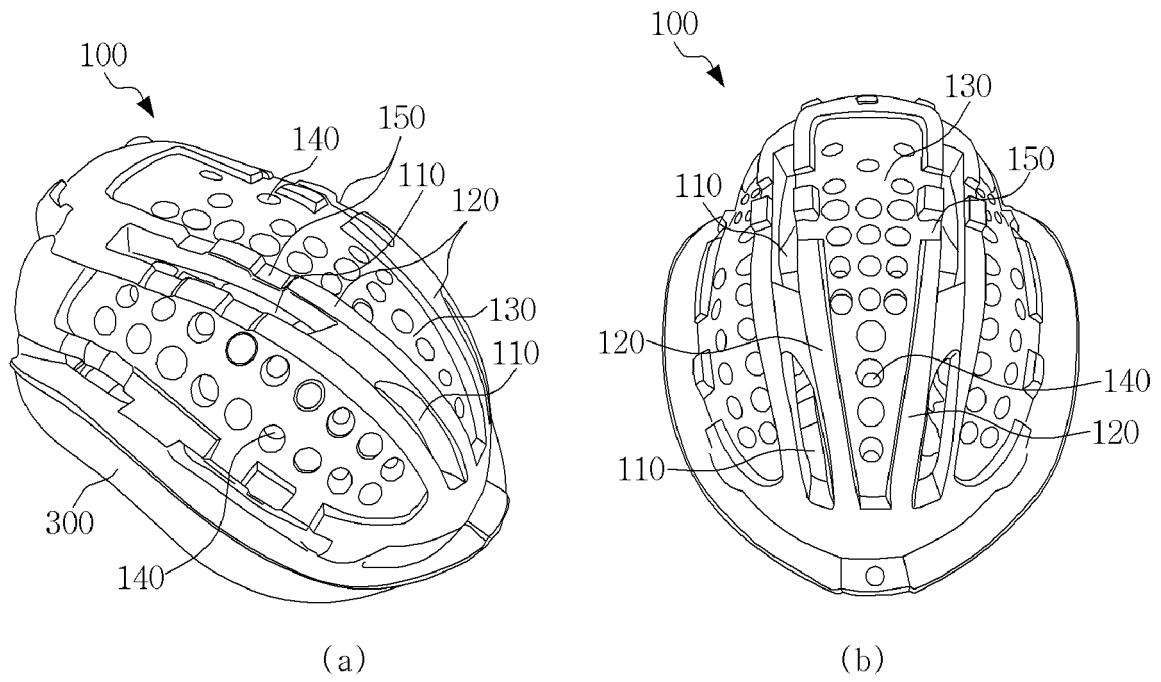


Fig. 1

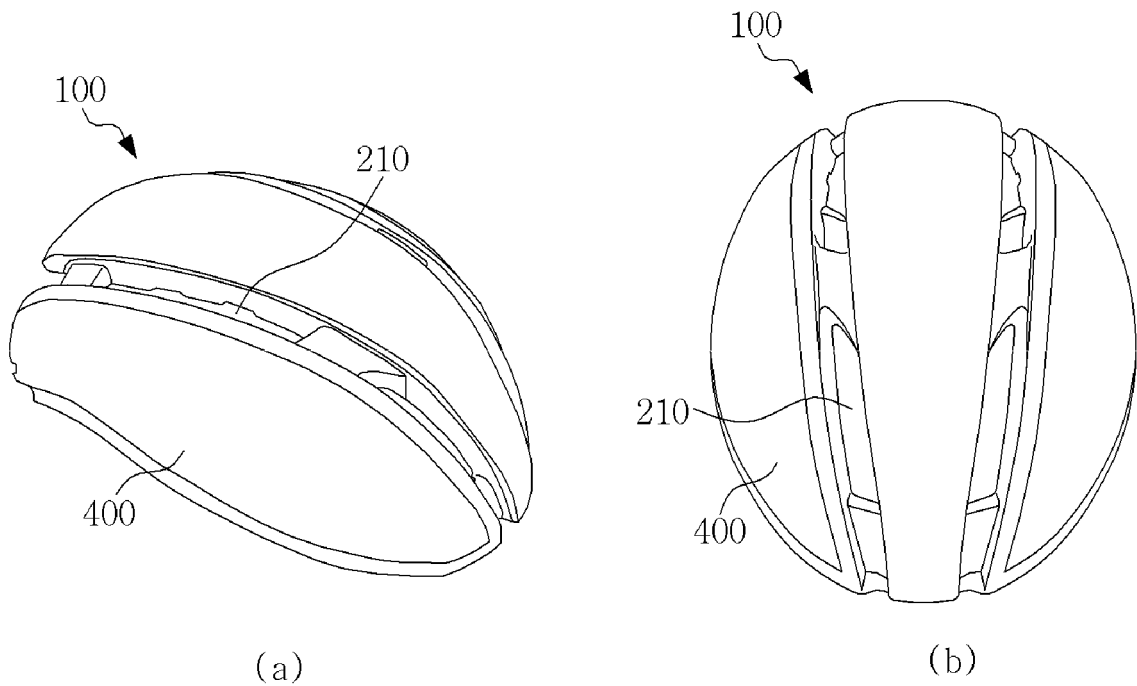


Fig. 2

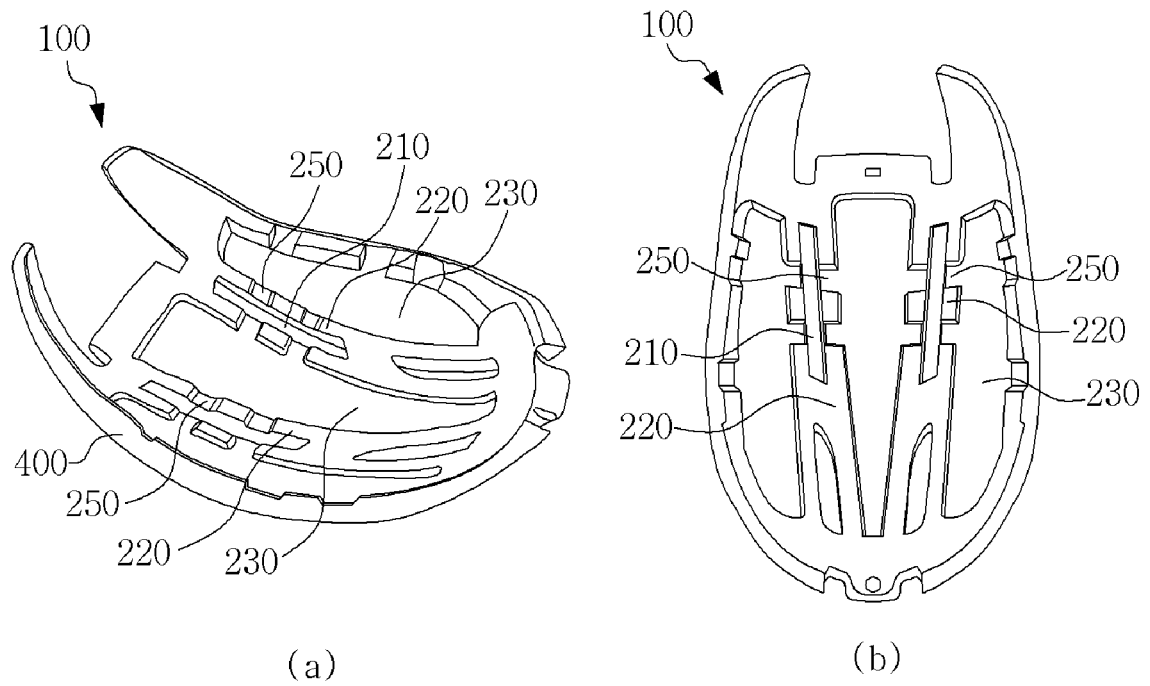


Fig. 3

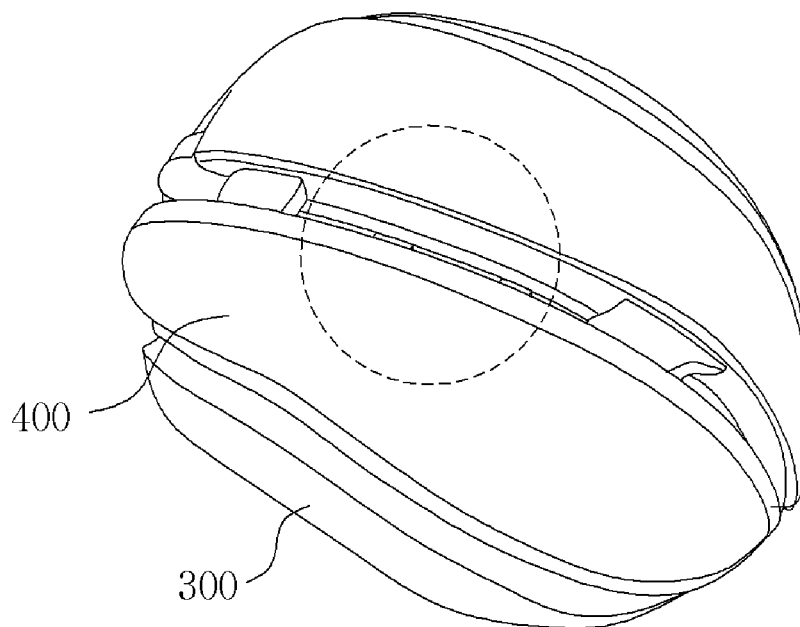


Fig. 4

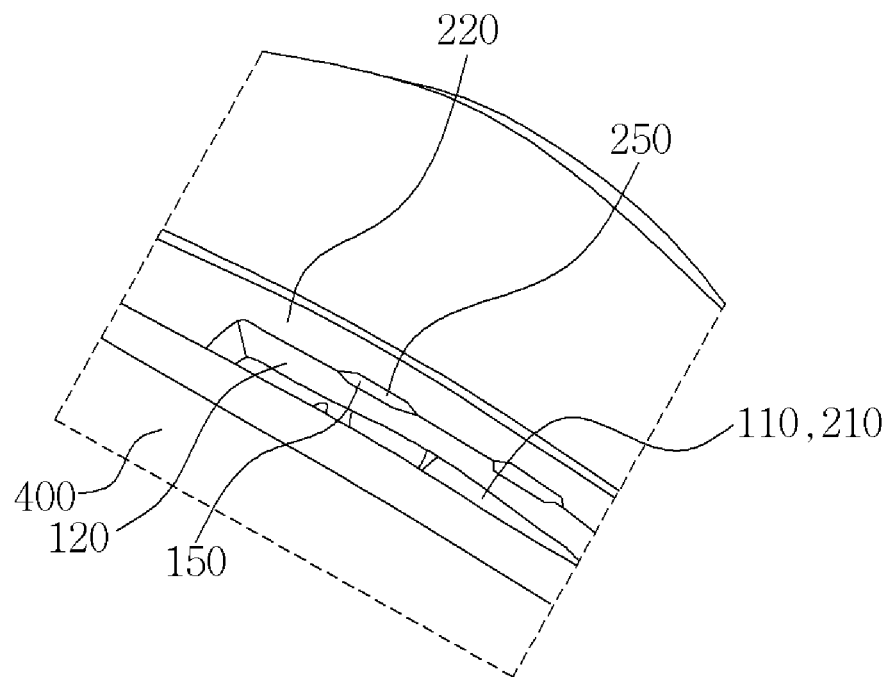


Fig. 5

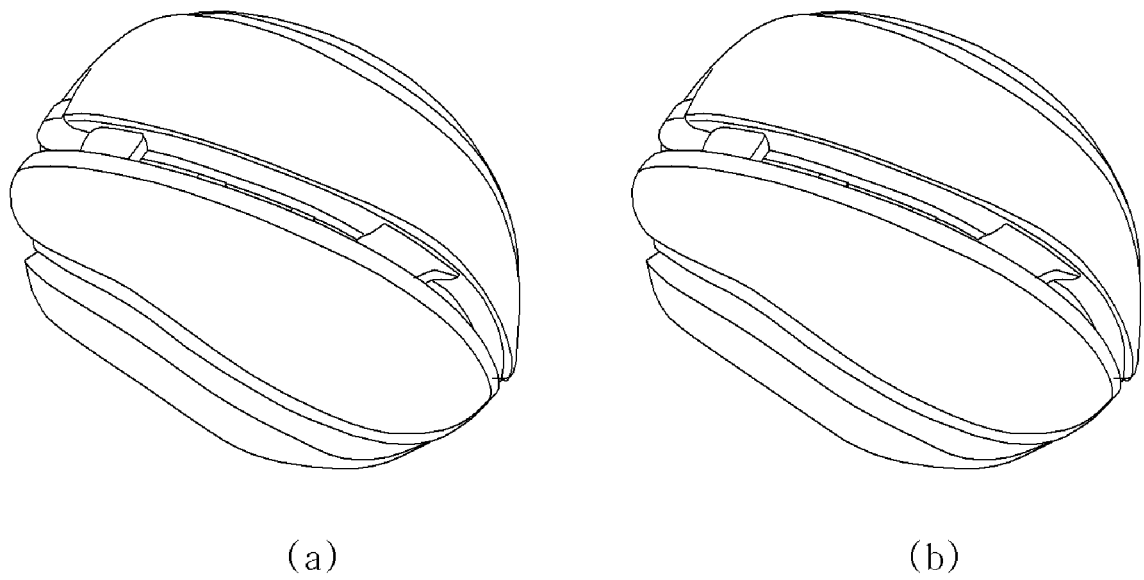


Fig. 6

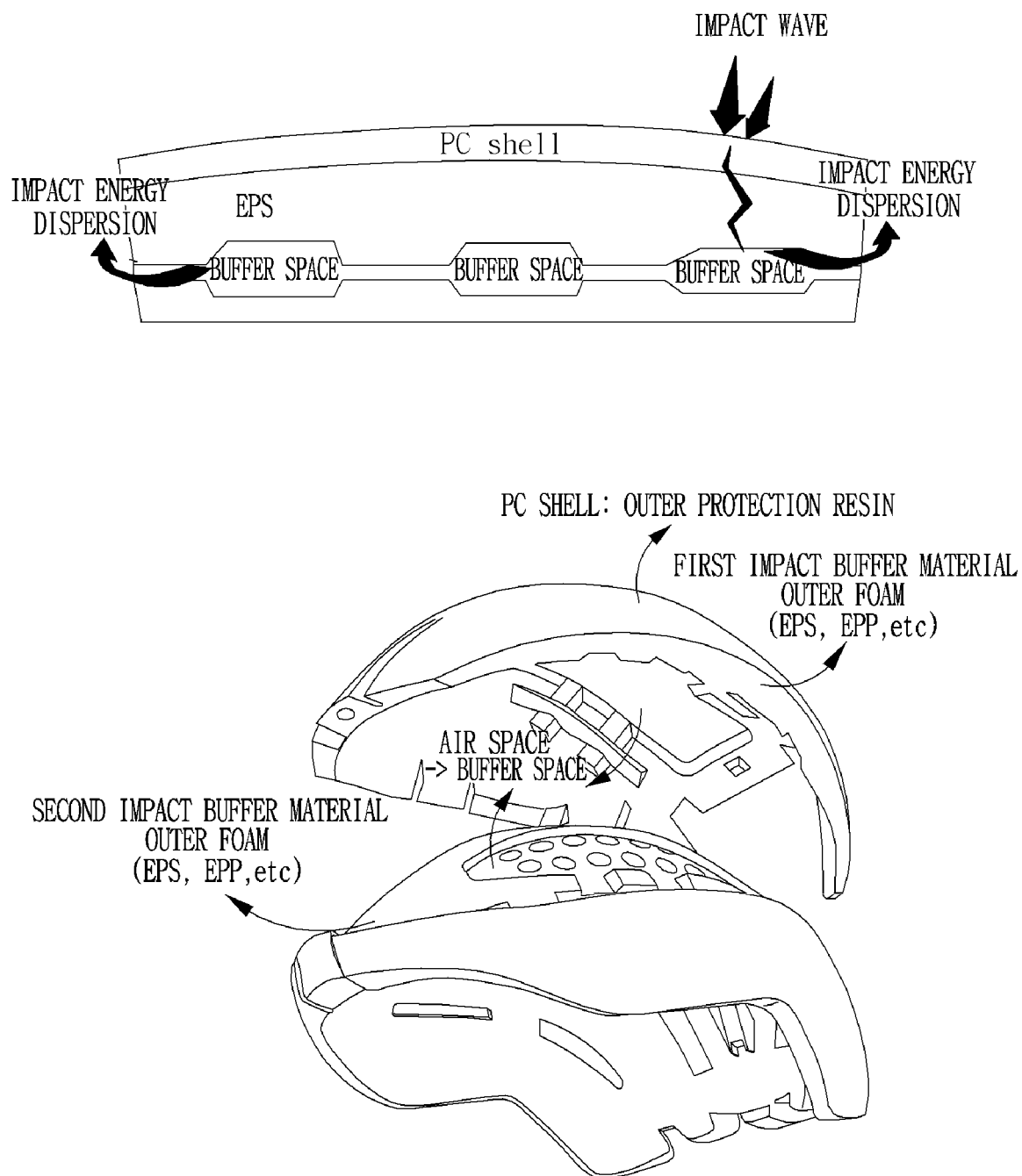


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2019/017533

A. CLASSIFICATION OF SUBJECT MATTER

A42B 3/12(2006.01)i, A42B 3/28(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A42B 3/12; A42B 3/00; A42B 3/08; A42B 3/28; A42B 3/32; A63B 071/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above

Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & Keywords: helmet, protective, ventilation

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007-0130673 A1 (WASSERKRUG, S. et al.) 14 June 2007 See claim 22; paragraphs [0016], [0017], [0020]; figure 4.	1-2
A	KR 10-1995-0026422 A (CHEIL INDUSTRIES INC.) 16 October 1995 See claim 1.	1-2
A	KR 10-2017-0007230 A (KIM, Jun Gu) 18 January 2017 See claim 1; paragraph [0027].	1-2
A	US 6904618 B2 (MUSAL, M. J.) 14 June 2005 See claims 1-2.	1-2
PX	KR 10-2052335 B1 (KIM, Yun Ho) 06 December 2019 See claims 1-2.	1-2

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search

19 MARCH 2020 (19.03.2020)

Date of mailing of the international search report

20 MARCH 2020 (20.03.2020)

Name and mailing address of the ISA/KR


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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2019/017533

Patent document cited in search report	Publication date	Patent family member	Publication date
US 2007-0130673 A1	14/06/2007	WO 2007-070462 A2 WO 2007-070462 A3	21/06/2007 16/08/2007
KR 10-1995-0026422 A	16/10/1995	KR 10-1996-0009230 B1	16/07/1996
KR 10-2017-0007230 A	18/01/2017	None	
US 6904618 B2	14/06/2005	US 2004-0250339 A1 WO 2005-006900 A2 WO 2005-006900 A3	16/12/2004 27/01/2005 16/06/2005
KR 10-2052335 B1	06/12/2019	None	

Form PCT/ISA/210 (patent family annex) (January 2015)