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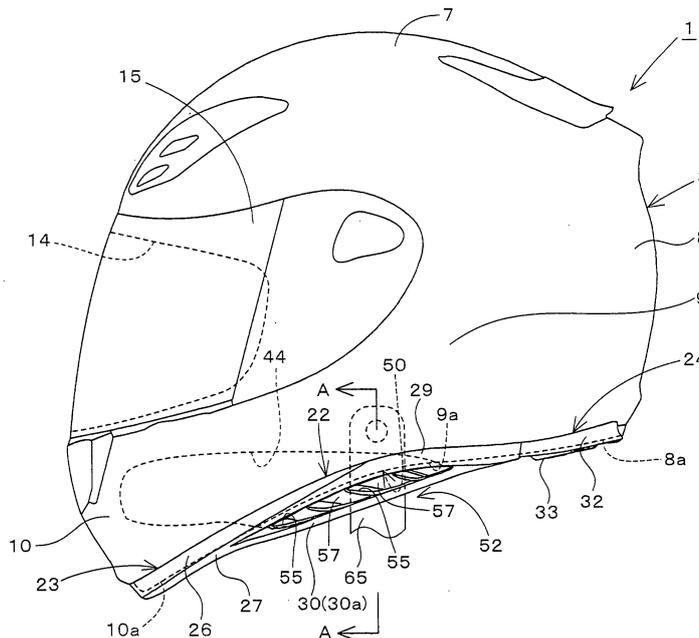
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(54) **HELMET**

(57) A helmet is provided that can be ventilated without any decrease in helmet-shell strength. The helmet comprises a helmet shell 3 and an impact-absorbing member 4 disposed along the inner surface of the helmet shell 3. The helmet shell 3 has paired right-hand and left-hand cheek-covering portions 9, and a side hemming member 22 is attached to a lower edge 9a of the cheek-covering portion 9. The cheek-covering portion 9 has an

upwardly cut-out portion 50 formed on its lower-end side, and the lower edge 9a of the cheek-covering portion 9 is slanted upward in peak form from both sides toward the center in front-back direction. The side hemming member 22 has a wide portion 52 formed so as to swell upward in peak form for obtaining a wide vertical width in correspondence with the cut-out portion 50, and the wide portion 52 has an air ejection hole 55.

Fig.1



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Description

Technical Field

[0001] The present invention relates to a helmet which is worn for a ride on a motorcycle or other purposes.

Background Art

[0002] Helmets that are worn for a ride on a motorcycle or other purposes include a type comprising a helmet shell and an impact-absorbing member disposed along the inner surface of the helmet shell, in which the helmet shell has a pair of right-hand and left-hand cheek-covering parts, and side hemming members are attached to the lower edges of the right-hand and left-hand cheek-covering parts.

[0003] In such a helmet of conventional type, air ejection holes are formed in the right-hand and left-hand cheek-covering parts of the helmet shell, so that air in the helmet is taken out of the air ejection holes for air ventilation of the interior of the helmet (refer to Patent literature 1, for example).

Prior Art Reference

Patent literature

[0004] Patent literature 1: Japanese Unexamined Patent Publication JP-A 7-197305 (1995)

Summary of the Invention

Problems to be solved by the Invention

[0005] Accordingly, in the conventional case, when a force is applied to the helmet shell, for example, the helmet shell may become cracked from its air ejection hole-bearing part, which results in the problem of deterioration of the strength of the helmet shell.

[0006] The present invention has been devised in view of the problem as mentioned supra, and accordingly its object is to provide a helmet that can be ventilated without any decrease in the strength of its helmet shell.

Means for solving the problem

[0007] The following is specific means for solving the problem pursuant to the present invention.

[0008] According to the technical means of the present invention for solving the technical problem, there is provided a helmet comprising:

- a helmet shell 3; and
- an impact-absorbing member 4 disposed along the inner surface of the helmet shell 3,
- the helmet shell 3 having a pair of right-hand and left-hand cheek-covering portions 9,

the right-hand, left-hand cheek-covering portion 9 being, at its lower edge 9a, fitted with a side hemming member 22,

the right-hand, left-hand cheek-covering portion 9 having an upwardly cut-out portion 50 formed on its lower-end side,

the lower edge 9a of the right-hand, left-hand cheek-covering portion 9 being made in peak form so as to be slanted upward from both sides toward a center thereof in a front-back direction,

the side hemming member 22 having a wide portion 52 formed so as to swell upward in peak form for obtaining a wide vertical width in correspondence with the cut-out portion 50,

the wide portion 52 being formed with an air ejection hole 55.

[0009] Moreover, according to another technical means of the present invention, the side hemming member 22 has a side engagement portion 29 of U-section which engages the lower edge 9a of the cheek-covering portion 9 and a side bend edge portion 30 protruding from the lower end of the side engagement portion 29, and that part of the side engagement portion 29 which corresponds to the wide portion 52 is curved in peak form so as to be slanted upward from both sides toward the center in the front-back direction along the lower edge 9a of the cheek-covering portion 9, and also, that part of the side bend edge portion 30 which corresponds to the wide portion 52 is made as a wide bend edge part 30a which protrudes downward, while being widened, from the side engagement portion 29, the wide bend edge part 30a being formed with the air ejection hole 55.

[0010] Moreover, according to another technical means of the present invention, the outer surface of the side hemming member 22 is formed with an outside-air guide surface 57 which is gradually inclined horizontally outwardly as it extends backward from the rear opening edge of the air ejection hole 55, or is gradually inclined horizontally inwardly as it extends forward from the front opening edge of the air ejection hole 55.

[0011] Moreover, according to another technical means of the present invention, a plurality of air ejection holes 55 are spaced apart in the front-back direction in the wide portion 52 of the side hemming member 22, and, the outside-air guide surface 57 is placed between the air ejection holes 55 arranged adjacent each other in the front-back direction, and is gradually inclined horizontally outwardly as it extends backward from the rear opening edge of the front-located air ejection hole 55 toward the front opening edge of the rear-located air ejection hole 55.

[0012] Moreover, according to another technical means of the present invention, the helmet shell 3 has a chin-covering portion 10 protruding forward from the lower side of the right-hand, left-hand cheek-covering portion 9, for covering the chin-to-mouth region of a helmet wearer, and, an air passageway 44 for causing exhaled air to

flow backward for its movement toward the air ejection hole 55 is formed inside the chin-covering portion 10 and the cheek-covering portion 9.

[0013] Moreover, according to another technical means of the present invention, the impact-absorbing member 4 situated ahead of the mouth of a helmet wearer is formed with a mouth communication hole 46 communicating with the front of the air passageway 44.

[0014] Moreover, according to another technical means of the present invention, the lower-end side of the impact-absorbing member 4 corresponding to the cheek-covering portion 9 protrudes downward beyond the lower edge 9a of the cheek-covering portion 9 corresponding to the cut-out portion 50 and extends up to the inside of the right and left of the wide portion 52 of the side hemming member 22, and, the lower side of the rear of the air passageway 44 is located on the inside of the right and left of the wide portion 52 of the side hemming member 22 and communicates with the air ejection hole 55 of the side hemming member 22.

[0015] Moreover, according to another technical means of the present invention, the air passageway 44 is formed in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corresponding to them by creating, at the outer surface of the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, a horizontally-inwardly sunken passageway-forming groove in the front-back direction.

[0016] Moreover, according to another technical means of the present invention, the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9 is formed with an inside-air communication hole 47 communicating with the air passageway 44 from the inner surface thereof.

[0017] Moreover, according to another technical means of the present invention, a pair of right-hand and left-hand cheek pads 36 is disposed inside the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, and, each of the cheek pads 36 has a pad communication hole 58 formed therethrough from the inside to the outside so as to communicate with the inside-air communication hole 47.

[0018] Moreover, according to another technical means of the present invention, a pair of right-hand and left-hand cheek pads 36 is disposed inside the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, the right-hand and left-hand cheek pads 36 having an insertion locking piece 41 bent upward from the outer-edge side of the lower end of the cheek pad 36 in the horizontal direction, and the insertion locking piece 41 is passed inside the right and left of the side hemming member 22 so as to be inserted in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corresponding to them, thereby holding the cheek pads 36 within the impact-absorbing

member 4, and also, an air vent 59 is formed in that part of the insertion locking piece 41 which corresponds to the air ejection hole 55, and a mesh sheet 60 is additionally provided in the insertion locking piece 41 so as to cover the air vent 59.

[0019] Moreover, according to another technical means of the present invention, the front ends of, respectively, the right-hand and left-hand cheek pads 36 are spaced apart in the horizontal direction at the front of the mouth of a helmet wearer, and, the impact-absorbing member 4 situated ahead of the mouth of the helmet wearer is formed with a mouth communication hole 46 communicating with the front of the air passageway 44, the mouth communication hole 46 being placed between the front ends of, respectively, the right-hand and left-hand cheek pads 36.

[0020] Moreover, according to another technical means of the present invention, paired right-hand and left-hand chin bands 65 are fixedly coupled to the inner-surface sides of the right-hand and left-hand cheek-covering portions 9, respectively, so as to extend downward through the inside of the right and left of the side hemming member 22, and, the wide portion 52 of the side hemming member 22 is placed in a position corresponding to the chin band 65.

[0021] Moreover, according to another technical means of the present invention, a pair of right-hand and left-hand cheek pads 36 is disposed inside the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, and the lower-end side of the impact-absorbing member 4 corresponding to the cheek-covering portion 9 is made concavely above the wide portion 52 of the side hemming member 22 and the lower part of the cheek pad 36, and also, a cavity passageway 68 is formed between the wide portion 52 of the side hemming member 22 and the lower part of the cheek pad 36 under the impact-absorbing member 4, and the lower side of the air passageway 44 communicates with the cavity passageway 68.

[0022] Moreover, according to another technical means of the present invention, the cheek pad 36 has, in its lower part, a pad communication hole 58 formed therethrough from the inside to the outside so as to communicate with the cavity passageway 68.

Effects of the Invention

[0023] According to the present invention, since the side hemming member is formed with the air ejection holes, there is no need to provide air ejection holes in the cheek-covering portion of the helmet shell, wherefore it is possible to avoid that the helmet shell becomes cracked from its air ejection hole-bearing part, and thereby keep the strength of the helmet shell at a high level.

[0024] In addition, the air ejection holes, being provided in the wide portion of the side hemming member expanding upward in correspondence with the cut-out portion, can be placed in a higher position relative to the

helmet shell, wherefore, for example, the air ejection holes can be placed in a position higher than a line segment connecting the lower end of the front of the helmet shell with the lower end of the rear thereof. Accordingly, air in the helmet can be effectively sucked out from the air ejection holes by a wind flowing laterally outside the helmet shell from front to rear, and it is thus possible to take the air in the helmet out of the plural air ejection holes formed in wide portion of the side hemming member, and thereby achieve sufficient air ventilation of the interior of the helmet.

Brief Description of Drawings

[0025]

[Fig. 1] Figure 1 is a side view of a helmet in accordance with the first embodiment of the present invention.

[Fig. 2] Figure 2 is a perspective view of the helmet.

[Fig. 3] Figure 3 is a sectional view taken along the line A-A shown in Fig. 1.

[Fig. 4] Figure 4 is a sectional view taken along the line B-B shown in Fig. 3.

[Fig. 5] Figure 5 is a side view of a hemming member.

[Fig. 6] Figure 6 is a sectional view taken along the line C-C shown in Fig. 5.

[Fig. 7] Figure 7 is a perspective view of a cheek pad.

[Fig. 8] Figure 8 is another perspective view of the cheek pad.

[Fig. 9] Figure 9 is a side view showing a motorcycle rider wearing the helmet.

[Fig. 10] Figure 10 is a sectional back view of the lower part of the helmet in accordance with the second embodiment.

Modes for Carrying out the Invention

[0026] Hereinafter, embodiments of the present invention will be described with reference to the drawings.

[0027] Figures 1 to 9 show the first embodiment of the present invention. In Figs. 1 to 4, a helmet 1 is a full-face motorcycle helmet composed of a hemispherical helmet shell 3 and an impact-absorbing member 4 disposed along the inner surface of the helmet shell 3.

[0028] The helmet shell 3, which is made of a fiber-reinforced resin, a hard resin, a metal, or the like, includes a head top-covering portion 7, a head back-covering portion 8, a pair of right-hand and left-hand cheek-covering portions 9, and a chin-covering portion 10. The chin-covering portion 10 protrudes forward from the lower parts of the right-hand and left-hand cheek-covering portions 9, for covering the chin-to-mouth region of the face of a helmet wearer.

[0029] The lower end of the helmet shell 3 is formed with a wearing opening 13 for wearing the helmet 1 in a manner as shown in Fig. 2. The opening edge of the wearing opening 13 is composed of a lower edge 8a of

the head back-covering portion 8, lower edges 9a of the right-hand and left-hand cheek-covering portions 9, and a lower edge 10a of the chin-covering portion 10.

[0030] In a region between the head top-covering portion 7 and the chin-covering portion 10, a front opening window 14 is formed between the front ends of, respectively, the right-hand and left-hand cheek-covering portions 9. The front opening window 14 is covered, for free closing and opening, with a light-transmittable shield plate 15.

[0031] The impact-absorbing member 4, which is made of a foam resin such as foam polystyrene, or styrofoam, includes a non-illustrated head top-covering body corresponding to the head top-covering portion 7 of the helmet shell 3, a non-illustrated head back-covering body corresponding to the head back-covering portion 8, a pair of right-hand and left-hand cheek-covering bodies 18 corresponding to the right-hand and left-hand cheek-covering portions 9, and a chin-covering body 19 corresponding to the chin-covering portion 10.

[0032] It is noted that the head top-covering body, the head back-covering body, the right-hand and left-hand cheek-covering bodies 18, and the chin-covering body 19 of the impact-absorbing member 4 may be formed in a one-piece design or formed partially integral with one another, or may be formed independently of one another.

[0033] Moreover, for example, the chin-covering body 19 may be divided into three pieces, namely a pair of right-hand and left-hand chin-covering body side parts and a chin-covering body front part.

[0034] Paired right-hand and left-hand side hemming members 22 are attached to the lower edges 9a of the right-hand and left-hand cheek-covering portions 9; a front hemming member 23 is attached to the lower edge 10a of the chin-covering portion 10; and a back hemming member 24 is attached to the lower edge 8a of the head back-covering portion 8. The right-hand and left-hand side hemming members 22, the front hemming member 23, and the back hemming member 24 are made of an elastic rubber material or a soft synthetic resin.

[0035] As also shown in Fig. 5, the front hemming member 23 includes a front engagement portion 26 of U-section which engages the lower edge 10a of the chin-covering portion 10, and a front bend edge portion 27 bent backward from the lower end of the front engagement portion 26. The right-hand and left-hand side hemming members 22 include a side engagement portion 29 of U-section which engages the lower edge 9a of the cheek-covering portion 9, and a side bend edge portion 30 protruding from the lower end of the side engagement portion 29.

[0036] The front hemming member 23 and the right-hand and left-hand side hemming members 22 are formed integral with each other, and the right-hand and left-hand rear ends of the front engagement portion 26 are so formed as to be continuous with the side engagement portions 29 of the right-hand and left-hand side hemming members 22, respectively, in the front-back di-

rection. The right-hand and left-hand rear ends of the front bend edge portion 27 are so formed as to be continuous with the side bend edge portions 30 of the right-hand and left-hand side hemming members 22, respectively, in the front-back direction.

[0037] The back hemming member 24, which includes a back engagement portion 32 of U-section which engages the lower edge of the head back-covering portion 8, and a back bend edge portion 33 bent forward from the lower end of the back engagement portion 32, is formed independently of the right-hand and left-hand side hemming members 22.

[0038] In Figs. 2 to 4, a pair of right-hand and left-hand cheek pads 36 is disposed inside the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9 (the chin-covering body 19 and the cheek-covering body 18). The right-hand and left-hand cheek pads 36 include a platy shape-retaining body 37 and a cushion body 38 attached to the inner surface of the shape-retaining body 37. The interior of the cushion body 38 is covered with a cover body 39 such as a cloth, and the cover body 39 is, at its outer periphery or other area, sewn to the outer periphery or other area of the shape-retaining body 37, whereby the cover body 39 and the shape-retaining body 37 surround the cushion body 38.

[0039] As shown in Fig. 7 and also in Fig. 8, the cheek pad 36 is formed with a band insertion hole 40 into which is inserted a chin band 65 which will hereafter be described. The front ends of, respectively, the right-hand and left-hand cheek pads 36 are spaced apart in a right-left, or horizontal direction at the front of the mouth of the helmet wearer.

[0040] Although not shown in the drawings, the impact-absorbing member 4 corresponding to the cheek-covering portion 9 (the cheek-covering body 18) is also formed with a band insertion hole in correspondence with the band insertion hole 40.

[0041] The right-hand and left-hand cheek pads 36 are each provided with an insertion locking piece 41 bent upward from the outer-edge side of the lower end of the cheek pad 36 in the horizontal direction. The insertion locking piece 41 is passed inside the right and left of the side hemming member 22 so as to be inserted in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corresponding to them, thereby holding the right-hand and left-hand cheek pads 36 within the impact-absorbing member 4.

[0042] In Figs. 1, 3, and 4, a pair of right-hand and left-hand air passageways 44 is formed inside the chin-covering portion 10 and the cheek-covering portions 9. The right-hand and left-hand air passageways 44, which are intended to cause exhaled air to flow backward from the front of the chin-covering portion 10 toward the rear of the cheek-covering portions 9, are formed in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corre-

sponding to them (the chin-covering body 19 and the cheek-covering body 18) by creating, at the outer surface of the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9 (the chin-covering body 19 and the cheek-covering body 18), horizontally-inwardly sunken passageway-forming grooves in the front-back direction. The air passageways 44 are each formed inside the chin-covering portion 10 and the cheek-covering portion 9 so as to extend from the front of the chin-covering portion 10 to the rear of the cheek-covering portions 9.

[0043] The impact-absorbing member 4 situated ahead of the mouth of the helmet wearer (the front of the chin-covering body 19) is formed with a pair of right-hand and left-hand mouth communication holes 46. The mouth communication holes 46, each of which is a hole formed all the way through from the inside to the outside of the front of the chin-covering body 19, communicate with the fronts of the right-hand and left-hand air passageways 44, respectively. The right-hand and left-hand mouth communication holes 46 are arranged on the front of the region between the front ends of the right-hand and left-hand cheek pads 36, so that exhaled air can be delivered to the front of the air passageway 44 through the mouth communication hole 46.

[0044] The impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9 (the chin-covering body 19 and the cheek-covering body 18) is formed with a plurality of inside-air communication holes 47, each of which communicates with some midpoint of the air passageway 44 in the front-back direction from the inner surface thereof, that are spaced apart in the front-back direction (three holes are assigned to each of the right-hand and left-hand air passageways 44 in the illustrated example).

[0045] In Figs. 1 and 2, the lower-end sides of the right-hand and left-hand cheek-covering portions 9 are formed with an upwardly cut-out portion 50, and the lower edges 9a of the right-hand and left-hand cheek-covering portions 9 are each made in peak form so as to be slanted upward from both sides toward the center in the front-back direction.

[0046] As also shown in Fig. 5, the side hemming member 22 has a wide portion 52, which corresponds to the cut-out portion 50, formed so as to swell upward in peak form thereby providing a wide vertical width.

[0047] That part of the side engagement portion 29 which corresponds to the wide portion 52 is curved in peak form so as to be slanted upward from both sides toward the center in the front-back direction along the lower edge 9a of the cheek-covering portion 9 corresponding to the cut-out portion 50.

[0048] That part of the side bend edge portion 30 which corresponds to the wide portion 52 is made as a wide bend edge part 30a which protrudes downward, while being widened, from the side engagement portion 29, and, this wide bend edge part 30a protrudes downward, while being slanted horizontally inwardly, from the side

engagement portion 29.

[0049] The front side of the side bend edge portion 30 beyond the wide portion 52 is greatly bent horizontally inwardly by degrees from the side engagement portion 29 as it extends forward, and is continuous with the rear of the front bend edge portion 27 of the front hemming member 23 in the front-back direction. The back side of the side bend edge portion 30 beyond the wide portion 52 is also greatly bent horizontally inwardly by degrees from the side engagement portion 29 as it extends backward.

[0050] In Figs. 1 to 6, the wide portion 52 of the side hemming member 22 is formed with an air ejection hole 55. In the wide bend edge part 30a of the side bend edge portion 30, a plurality of air ejection holes 55 are spaced apart in the front-back direction (four holes are assigned to each of the wide portions 52 of the right-hand and left-hand side hemming members 22 in the illustrated example).

[0051] The plural air ejection holes 55 are formed in the wide portion 52 expanding upward in correspondence with the cut-out portion 50, and are located in a position higher than a line segment connecting the lower end of the front of the helmet shell 3 with the lower end of the rear thereof.

[0052] The outer surface of the wide bend edge part 30a of the side hemming member 22 is formed with a plurality of outside-air guide surfaces 57. The outside-air guide surface 57, which is situated on the rear side or front side of the air ejection hole 55, is gradually inclined horizontally outwardly as it extends backward from the rear opening edge of the air ejection hole 55, or is gradually inclined horizontally inwardly as it extends forward from the front opening edge of the air ejection hole 55.

[0053] In this embodiment, each of the outside-air guide surfaces 57 is located between the air ejection holes 55 arranged adjacent each other in the front-back direction in the wide bend edge part 30a, and is gradually inclined horizontally outwardly as it extends backward from the rear opening edge of the front-located air ejection hole 55 toward the front opening edge of the rear-located air ejection hole 55.

[0054] As shown in Fig. 3, the lower-end side of the impact-absorbing member 4 corresponding to the cheek-covering portion 9 (the cheek-covering body 18) is not formed with a concavity corresponding to the cut-out portion 50, and, the lower-end side of the impact-absorbing member 4 corresponding to the cheek-covering portion 9 (the cheek-covering body 18) protrudes downward beyond the lower edge 9a of the cheek-covering portion 9 corresponding to the cut-out portion 50, and extends up to the inside of the right and left of the wide portion 52 of the side hemming member 22. The lower side of the rear of the above-described air passageway 44 is located on the inside of the right and left of the wide portion 52 of the side hemming member 22, and communicates with the plural air ejection holes 55 of the side hemming member 22.

[0055] As shown in Figs. 3 and 4, the above-described cheek pad 36 has a plurality of pad communication holes 58 formed therethrough from the inside to the outside, which communicate with their respective inside-air communication holes 47. The pad communication holes 58 are each formed in the horizontal direction by drilling through the region between the shape-retaining body 37 and the cushion body 38, with the cover body 39 left intact.

[0056] In Figs. 3, 4, 7, and 8, an air vent 59 is formed in that part of the above-described insertion locking piece 41 which corresponds to the air ejection hole 55, and, a mesh sheet 60 is additionally provided on the outer surface of the insertion locking piece 41 so as to cover the air vent 59.

[0057] It is noted that the air vent 59 may either be disposed in alignment with the air ejection hole 55 in the front-back direction and the vertical direction as well, or be slightly displaced from the air ejection hole 55 in the front-back direction or the vertical direction.

[0058] The lower end of the cover body 39 is formed with a cover-body extended portion 61 elongated horizontally outwardly relative to the shape-retaining body 37, and, the protruding end of the cover-body extended portion 61 is sewn to the outer surface of the lower part of the insertion locking piece 41. Moreover, a coupling sheet 63 made of a cloth or the like is disposed between the lower end of the insertion locking piece 41 and the lower end of the shape-retaining body 37, and, one end of the coupling sheet 63 in its width direction is sewn to the outer surface of the lower end of the shape-retaining body 37. The widthwise other end of the coupling sheet 63 and the above-described cover-body extended portion 61 overlap each other, and the widthwise other end of the coupling sheet 63 is, together with the protruding end of the cover-body extended portion 61 and the lower part of the mesh sheet 60, sewn to the outer surface of the lower part of the insertion locking piece 41. The coupling sheet 63 and the cover-body extended portion 61 are coupled to each other in a manner such that the insertion locking piece 41 can be freely folded toward the lower end of the cheek pad 36.

[0059] As shown in Figs. 1 and 2, the paired right-hand and left-hand chin bands 65 are fixedly coupled to the inner-surface sides of the right-hand and left-hand cheek-covering portions 9, respectively. The chin band 65 is inserted into the band insertion hole of the impact-absorbing member 4 corresponding to the cheek-covering portion 9 (the chin-covering body 19) and the band insertion hole 40 of the cheek pad 36, and extends downward through the inside of the right and left of the side hemming member 22 and the cheek pad 36. The wide portion 52 of the side hemming member 22 is placed in a position corresponding to the chin band 65.

[0060] According to the first embodiment thus far described, when the helmet wearer drives a motorcycle, as shown in Fig. 9, a wind flows laterally outside the helmet shell 3 from front to rear. As shown in Fig. 6, where this

wind is guided to turn laterally outwardly by the plural outside-air guide surfaces 57, a negative pressure is developed laterally outside the plural air ejection holes 55, whereby the air in the helmet 1 can be drawn out of the plural air ejection holes 55 under suction. Thus, since the air in the helmet shell 3 can be effectively sucked out by the plural air ejection holes 55 arranged in the front-back direction, it is possible to take the air in the helmet 1 out of the plural air ejection holes 55, and thereby achieve sufficient air ventilation of the interior of the helmet 1.

[0061] Accordingly, there is no need to provide air ejection holes in the cheek-covering portion 9 of the helmet shell 3, wherefore it is possible to avoid that the helmet shell 3 becomes cracked from its air ejection hole-bearing part, and thereby keep the strength of the helmet shell 3 at a high level.

[0062] In addition, the air ejection holes 55 are provided in the wide portion 52 expanding upward in correspondence with the cut-out portion 50, and can therefore be placed in a higher position relative to the helmet shell 3. Thus, for example, the air ejection holes 55 can be placed in a position higher than a line segment connecting the lower end of the front of the helmet shell 3 with the lower end of the rear thereof, wherefore the air in the helmet 1 can be effectively and smoothly sucked out from the air ejection holes 55 by the wind flowing laterally outside the helmet shell 3 from front to rear.

[0063] Moreover, as shown in Fig. 4, the exhaled air of the helmet wearer is delivered from the region between the front ends of the right-hand and left-hand cheek pads 36 to the front of the air passageway 44 through the mouth communication hole 46, is whereafter delivered to the rear of the air passageway 44, and is then discharged laterally outwardly of the helmet from the plural air ejection holes 55. At this time, since the lower side of the rear of the air passageway 44 is located on the inside of the right and left of the wide portion 52 of the side hemming member 22 and communicates with the air ejection holes 55 of the side hemming member 22, it follows that the exhaled air which entered the air passageway 44 is also drawn toward the air ejection holes 55 by the force of suction under which the air in the helmet 1 is sucked out from the air ejection holes 55, and consequently the exhaled air flows backward smoothly through the air passageway 44 so as to be delivered from the lower side of the rear of the air passageway 44 to the air ejection holes 55, and is then smoothly discharged out of the air ejection holes 55.

[0064] Moreover, the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9 is formed with the inside-air communication holes 47 communicating with the air passageway 44 from the inner surface thereof, and also the cheek pad 36 is formed with the pad communication holes 58 communicating with the inside-air communication holes 47. This makes it possible to deliver the inside air within the impact-absorbing member 4 and the cheek pad 36 to the air passageway 44 through the pad com-

munication holes 58 and the inside-air communication holes 47, so that not only the exhaled air, but also the inside air within the impact-absorbing member 4 and the cheek pad 36 can be smoothly delivered out of the air ejection holes 55 through the air passageway 44, whereby the interior of the helmet 1 can be ventilated more reliably.

[0065] Moreover, the above-described air passageway 44 is formed in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corresponding to them by creating, at the outer surface of the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, a horizontally-inwardly sunken passageway-forming groove in the front-back direction. With the provision of the passageway-forming groove in the impact-absorbing member 4, the air passageway 44 can be readily formed inside the chin-covering portion 10 and the cheek-covering portion 9.

[0066] Moreover, the right-hand and left-hand cheek pads 36 have the insertion locking piece 41 bent upward from the outer-edge side of the lower end of the cheek pad 36 in the horizontal direction, and, the insertion locking piece 41 is passed inside the right and left of the side hemming member 22 so as to be inserted in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corresponding to them, thereby holding the cheek pads 36 within the impact-absorbing member 4. By virtue of the insertion locking piece 41, the paired right-hand and left-hand cheek pads 36 can be held easily and reliably within the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9.

[0067] In addition, the air vent 59 is formed in that part of the above-described insertion locking piece 41 which corresponds to the air ejection hole 55, and the mesh sheet 60 is additionally provided in the insertion locking piece 41 so as to cover the air vent 59. This makes it possible to avoid that the air ejection hole 55 is blocked by the insertion locking piece 41 with a consequent inability to take the air in the helmet 1 out of the air ejection hole 55.

[0068] Moreover, the paired right-hand and left-hand chin bands 65 are fixedly coupled to the inner-surface sides of the right-hand and left-hand cheek-covering portions 9, respectively, so as to extend downward through the inside of the right and left of the side hemming member 22, and, the wide portion 52 of the side hemming member 22 is placed in a position corresponding to the chin band 65. Thus, when the helmet 1 is put on through the wearing opening 13, the right-hand and left-hand chin bands 65 are pulled horizontally (rightwardly and leftwardly, respectively) outwardly, thereby causing the wide portion 52 of the side hemming member 22 to spread, together with the lower parts of the cheek pad 36 and the impact-absorbing member 4, horizontally outwardly in skirt-like form. This helps facilitate the insertion of wear-

er's head into the helmet through the wearing opening 13, wherefore the wearer is able to put on the helmet 1 with ease.

[0069] In Fig. 10, there is shown the second embodiment in which the impact-absorbing member 4 corresponding to the cheek-covering portion 9 (the cheek-covering body 18) has its lower edge made shorter in the vertical direction so as to be substantially flush with the lower edge 9a of the cheek-covering portion 9 corresponding to the cut-out portion 50, and made concavely above the wide portion 52 of the side hemming member 22 and the lower part of the cheek pad 36, and also, in a region between the wide portion 52 of the side hemming member 22 and the lower part of the cheek pad 36 under the impact-absorbing member 4 corresponding to the cheek-covering portion 9, there is formed a cavity passageway 68 surrounded with the side hemming member 22, the cheek pad 36, and the coupling sheet 63. Moreover, the lower side of the air passageway 44 communicates with the cavity passageway 68, and, the cheek pad 36 has, in its lower part, a pad communication hole 58 formed therethrough from the inside to the outside so as to communicate with the cavity passageway 68. A single pad communication hole 58 is formed, or a plurality of pad communication holes 58 are spaced apart in the front-back direction, in each of the right-hand and left-hand cheek pads 36. Otherwise, the second embodiment is structurally identical with the first embodiment described earlier. Note that, in the case of this embodiment, the inside-air communication hole 47 of the impact-absorbing member 4 provided in the first embodiment may either be omitted or be provided.

[0070] According to the second embodiment thus far described, as is the case with the first embodiment, the wind flowing laterally outside the helmet shell 3 from front to rear is guided to turn laterally outwardly by the plural outside-air guide surfaces 57, wherefore the air in the helmet shell 3 can be effectively sucked out by the plural air ejection holes 55 arranged in the front-back direction. This makes it possible to take the air in the helmet 1 out of the plural air ejection holes 55, and thereby achieve sufficient air ventilation of the interior of the helmet 1.

[0071] The exhaled air of the helmet wearer is delivered from the region between the front ends of the right-hand and left-hand cheek pads 36 to the front of the air passageway 44 through the mouth communication hole 46, is whereafter delivered to the rear of the air passageway 44 so as to enter the cavity passageway 68, and is then discharged laterally outwardly of the helmet 1 from the cavity passageway 68 via the plural air ejection holes 55.

[0072] Moreover, the inside air within the cheek pad 36 is delivered to the cavity passageway 68 through the pad communication hole 58, so that not only the exhaled air, but also the inside air within the cheek pad 36 can be smoothly delivered out of the air ejection holes 55 through the cavity passageway 68.

[0073] Although, in the above-described embodi-

ments, the helmet 1 is the full-face helmet having the chin-covering portion 10, the helmet 1 is not so limited, but may be an open-face helmet having no chin-covering portion 10.

[0074] Moreover, although, in the above-described embodiments, four air ejection holes 55 are spaced apart in the front-back direction in the wide portion 52 of the side hemming member 22, the number of the air ejection holes 55 is not limited to four, but may be one to three, or five or more.

[0075] Moreover, in the above-described embodiments, the air passageway 44 for causing exhaled air to flow backward for its movement toward the air ejection holes 55 is formed in between the chin-covering portion 10 as well as the cheek-covering portion 9 and the impact-absorbing member 4 corresponding to them by creating, at the outer surface of the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, the passageway-forming groove in the front-back direction. However, instead of this, it is also possible to form an air passageway 44 for causing exhaled air to flow backward for its movement toward the air ejection holes 55 within the impact-absorbing member 4 located inside the chin-covering portion 10 and the cheek-covering portion 9 by creating, in the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, a passageway-forming groove in the front-back direction. In another alternative, an air passageway 44 for causing exhaled air to flow backward for its movement toward the air ejection holes 55 can be formed in between the cheek pad 36 and the impact-absorbing member 4 located inside the chin-covering portion 10 and the cheek-covering portion 9 by creating, at the outer surface of the impact-absorbing member 4 corresponding to the chin-covering portion 10 and the cheek-covering portion 9, a horizontally-inwardly sunken passageway-forming groove in the front-back direction.

[0076] Moreover, although, in the above-described embodiments, the impact-absorbing member 4 situated ahead of the mouth of the helmet wearer is formed with the paired right-hand and left-hand mouth communication holes 46, instead of this, it is also possible to form a single mouth communication hole 46 in the impact-absorbing member 4 situated ahead of the mouth of the helmet wearer so as to communicate with the fronts of the right-hand and left-hand air passageways 44.

Explanation of Reference symbols

[0077]

1	helmet
3	helmet shell
4	impact-absorbing member
7	head top-covering portion
8	head back-covering portion
8a	lower edge

9 cheek-covering portion
 9a lower edge
 10 chin-covering portion
 10a lower edge
 13 wearing opening
 14 front opening window
 15 shield plate
 22 side hemming member
 23 front hemming member
 24 back hemming member
 26 front engagement portion
 27 front bend edge portion
 29 side engagement portion
 30 side bend edge portion
 30a wide bend edge part
 32 back engagement portion
 33 back bend edge portion
 36 cheek pad
 41 insertion locking piece
 44 air passageway
 46 mouth communication hole
 47 inside-air communication hole
 50 cut-out portion
 52 wide portion
 55 air ejection hole
 57 outside-air guide surface
 58 pad communication hole
 59 air vent
 60 mesh sheet
 65 chin band
 68 cavity passageway

Claims

1. A helmet comprising:

a helmet shell (3); and
 an impact-absorbing member (4) disposed
 along an inner surface of the helmet shell (3),
 the helmet shell (3) having a pair of right-hand
 and left-hand cheek-covering portions (9),
 the right-hand, left-hand cheek-covering portion
 (9) being, at its lower edge (9a), fitted with a side
 hemming member (22),
 the right-hand, left-hand cheek-covering portion
 (9) having an upwardly cut-out portion (50)
 formed on its lower-end side, the lower edge (9a)
 of the right-hand, left-hand cheek-covering por-
 tion (9) being made in peak form so as to be
 slanted upward from both sides toward a center
 thereof in a front-back direction,
 the side hemming member (22) having a wide
 portion (52) formed so as to swell upward in peak
 form for obtaining a wide vertical width in corre-
 spondence with the cut-out portion (50),
 the wide portion (52) being formed with an air
 ejection hole (55).

2. The helmet according to claim 1,
 wherein the side hemming member (22) has a side
 engagement portion (29) of U-section which engag-
 es the lower edge (9a) of the cheek-covering portion
 (9), and a side bend edge portion (30) protruding
 from the lower end of the side engagement portion
 (29),
 wherein that part of the side engagement portion (29)
 which corresponds to the wide portion (52) is curved
 in peak form so as to be slanted upward from both
 sides toward the center in the front-back direction
 along the lower edge (9a) of the cheek-covering por-
 tion (9),
 and wherein that part of the side bend edge portion
 (30) which corresponds to the wide portion (52) is
 made as a wide bendedgepart (30a) which protrudes
 downward, while being widened, from the side en-
 gagement portion (29), the wide bend edge part
 (30a) being formed with said air ejection hole (55).
3. The helmet according to claim 1,
 wherein the outer surface of the side hemming mem-
 ber (22) is formed with an outside-air guide surface
 (57) which is gradually inclined horizontally outwardly
 as it extends backward from the rear opening edge
 of the air ejection hole (55), or is gradually inclined
 horizontally inwardly as it extends forward from the
 front opening edge of the air ejection hole (55).
4. The helmet according to claim 3,
 wherein a plurality of said air ejection holes (55) are
 spaced apart in the front-back direction in the wide
 portion (52) of the side hemming member (22),
 wherein said outside-air guide surface (57) is placed
 between the air ejection holes (55) arranged adja-
 cent each other in the front-back direction, and is
 gradually inclined horizontally outwardly as it ex-
 tends backward from the rear opening edge of the
 front-located air ejection hole (55) toward the front
 opening edge of the rear-located air ejection hole
 (55).
5. The helmet according to claim 1,
 wherein said helmet shell (3) has a chin-covering
 portion (10) protruding forward from the lower side
 of the right-hand, left-hand cheek-covering portion
 (9), for covering the chin-to-mouth region of a helmet
 wearer,
 and wherein an air passageway (44) for causing ex-
 haled air to flow backward for its movement toward
 said air ejection hole (55) is formed inside the chin-
 covering portion (10) and the cheek-covering portion
 (9).
6. The helmet according to claim 5,
 wherein the impact-absorbing member (4) situated
 ahead of the mouth of a helmet wearer is formed with
 a mouth communication hole (46) communicating

with the front of said air passageway (44).

7. The helmet according to claim 5, wherein the lower-end side of the impact-absorbing member (4) corresponding to the cheek-covering portion (9) protrudes downward beyond the lower edge (9a) of the cheek-covering portion (9) corresponding to the cut-out portion (50), and extends up to the inside of the right and left of the wide portion (52) of the side hemming member (22), and wherein the lower side of the rear of said air passageway (44) is located on the inside of the right and left of the wide portion (52) of the side hemming member (22), and communicates with the air ejection hole (55) of the side hemming member (22).
8. The helmet according to claim 5, wherein said air passageway (44) is formed in between the chin-covering portion (10) as well as the cheek-covering portion (9) and the impact-absorbing member (4) corresponding to them by creating, at the outer surface of the impact-absorbing member (4) corresponding to the chin-covering portion (10) and the cheek-covering portion (9), a horizontally-inwardly sunken passageway-forming groove in the front-back direction.
9. The helmet according to claim 8, wherein the impact-absorbing member (4) corresponding to the chin-covering portion (10) and the cheek-covering portion (9) is formed with an inside-air communication hole (47) communicating with the air passageway (44) from the inner surface thereof.
10. The helmet according to claim 9, wherein a pair of right-hand and left-hand cheek pads (36) is disposed inside the impact-absorbing member (4) corresponding to the chin-covering portion (10) and the cheek-covering portion (9), and wherein each of the cheek pads (36) has a pad communication hole (58) formed therethrough from the inside to the outside so as to communicate with said inside-air communication hole (47).
11. The helmet according to claim 5, wherein a pair of right-hand and left-hand cheek pads (36) is disposed inside the impact-absorbing member (4) corresponding to said chin-covering portion (10) and said cheek-covering portion (9), the right-hand, left-hand cheek pad (36) having an insertion locking piece (41) bent upward from the outer-edge side of the lower end of the cheek pad (36) in the horizontal direction, wherein the insertion locking piece (41) is passed inside the right and left of the side hemming member (22) so as to be inserted in between the chin-covering portion (10) as well as the cheek-covering portion (9) and the impact-absorbing member (4) corresponding to them, thereby holding the cheek pads (36) within the impact-absorbing member (4), and wherein an air vent (59) is formed in that part of said insertion locking piece (41) which corresponds to the air ejectionhole (55), and a meshsheet (60) is additionally provided in the insertion locking piece (41) so as to cover the air vent (59).
12. The helmet according to claim 11, wherein the front ends of, respectively, the right-hand and left-hand cheek pads (36) are spaced apart in the horizontal direction at the front of the mouth of a helmet wearer, and wherein the impact-absorbing member (4) situated ahead of the mouth of the helmet wearer is formed with a mouth communication hole (46) communicating with the front of said air passageway (44), the mouth communication hole (46) being placed between the front ends of, respectively, the right-hand and left-hand cheek pads (36).
13. The helmet according to claim 1, wherein paired right-hand and left-hand chin bands (65) are fixedly coupled to the inner-surface sides of the right-hand and left-hand cheek-covering portions (9), respectively, so as to extend downward through the inside of the right and left of the side hemming member (22), and wherein the wide portion (52) of the side hemming member (22) is placed in a position corresponding to the chin band (65).
14. The helmet according to claim 5, wherein a pair of right-hand and left-hand cheek pads (36) is disposed inside the impact-absorbing member (4) corresponding to said chin-covering portion (10) and said cheek-covering portion (9), wherein the lower-end side of the impact-absorbing member (4) corresponding to the cheek-covering portion (9) is made concavely above the wide portion (52) of the side hemming member (22) and the lower part of the cheek pad (36), and wherein a cavity passageway (68) is formed between the wide portion (52) of the side hemming member (22) and the lower part of the cheek pad (36) under the impact-absorbing member (4), and the lower side of said air passageway (44) communicates with the cavity passageway (68).
15. The helmet according to claim 14, wherein the cheek pad (36) has, in its lower part, a pad communication hole (58) formed therethrough from the inside to the outside so as to communicate with the cavity passageway (68).

Fig.2

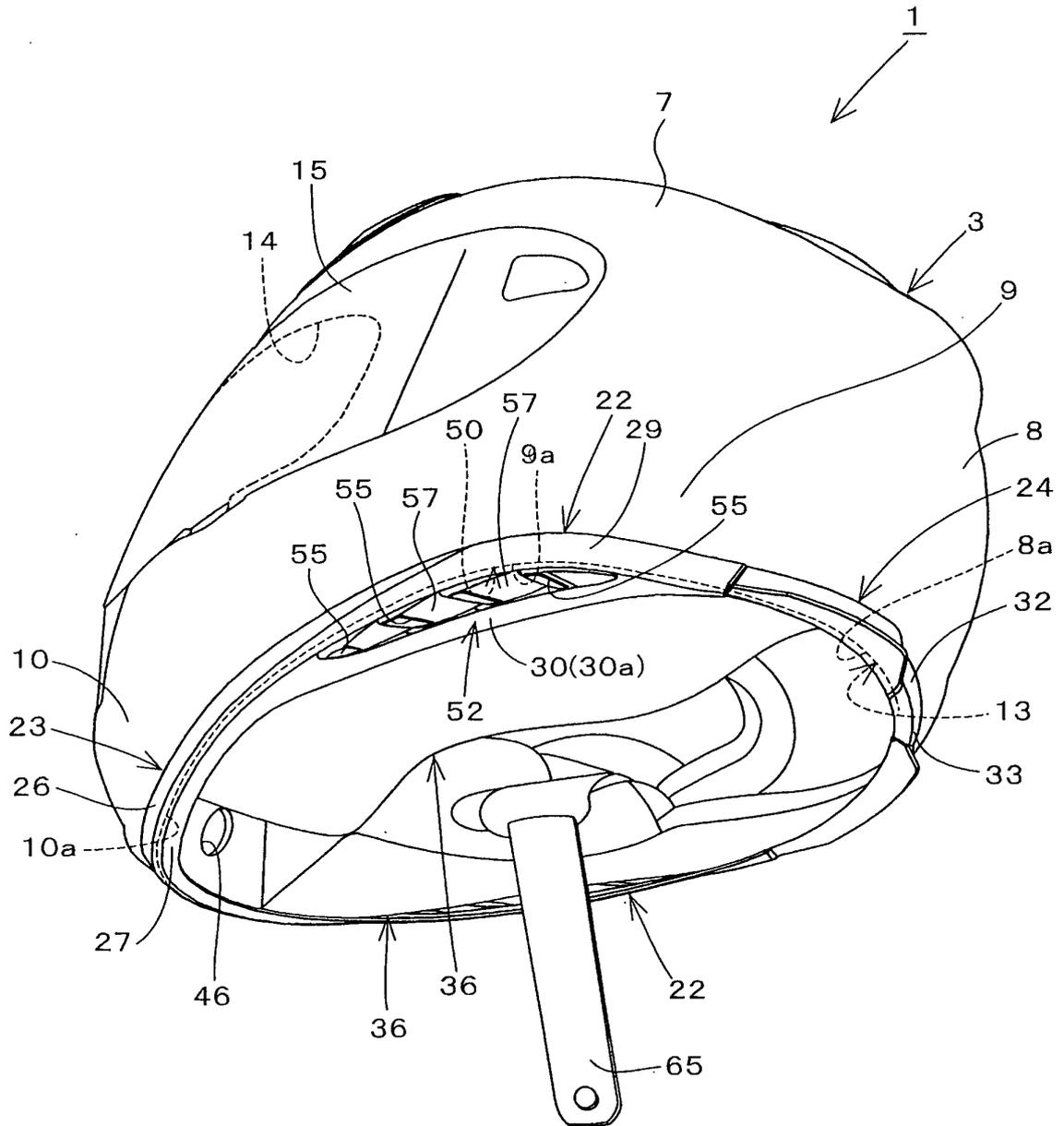


Fig.4

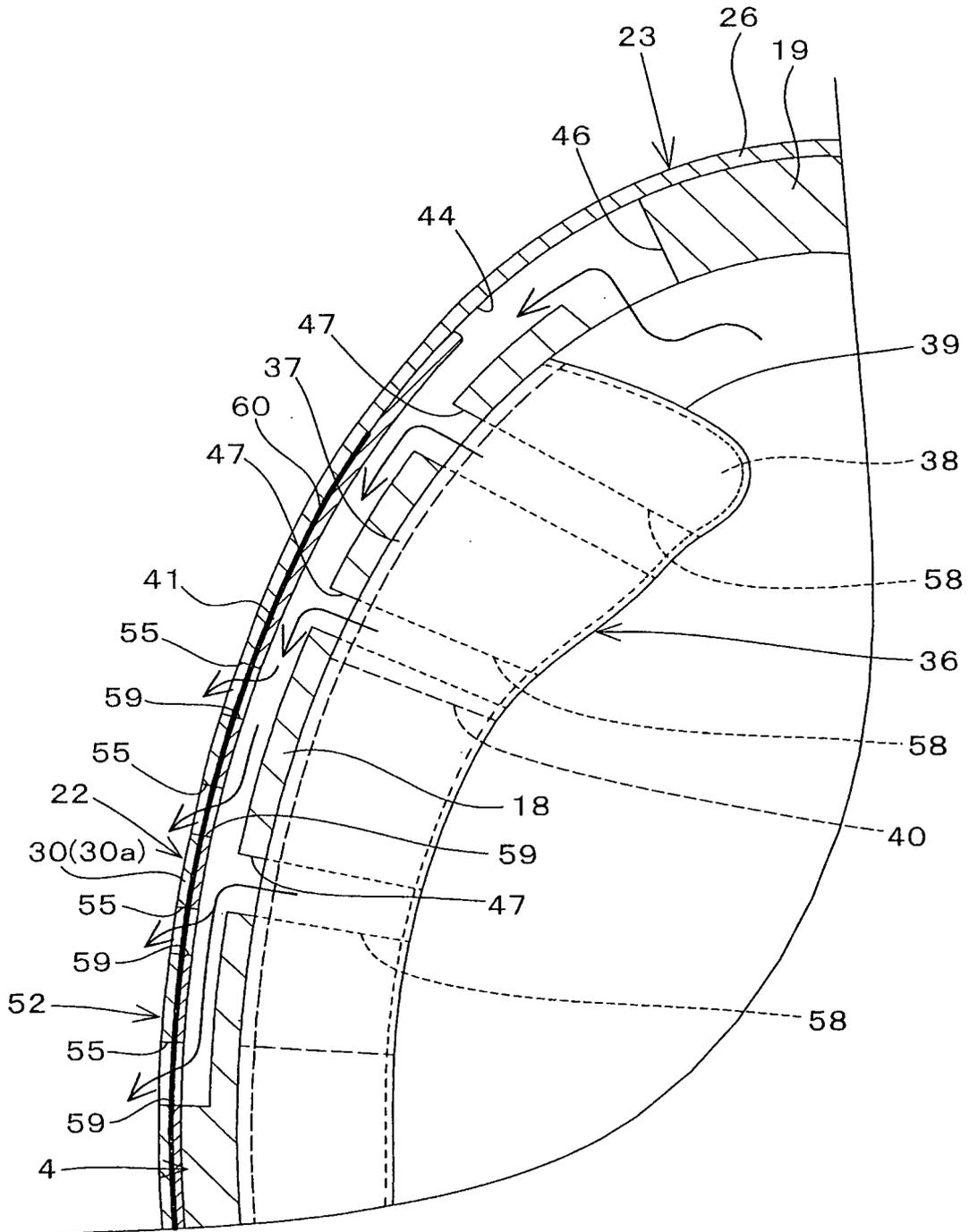


Fig.5

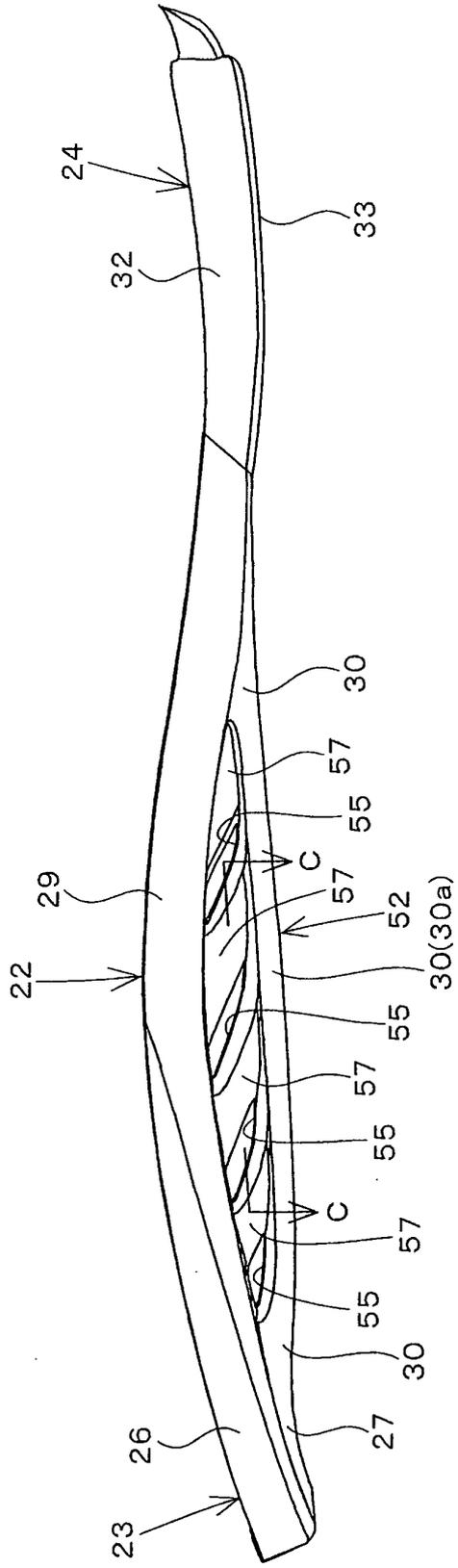


Fig.6

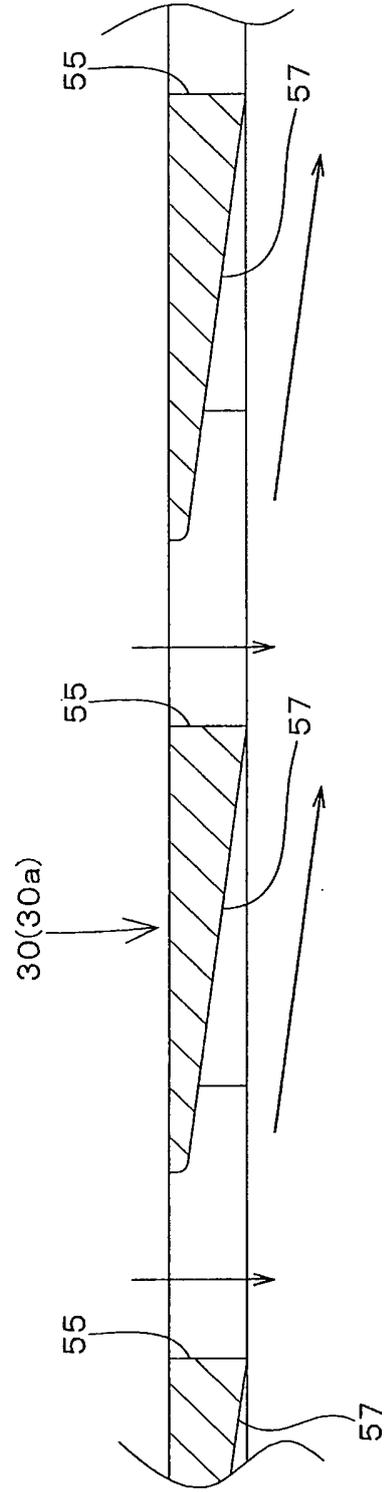


Fig.7

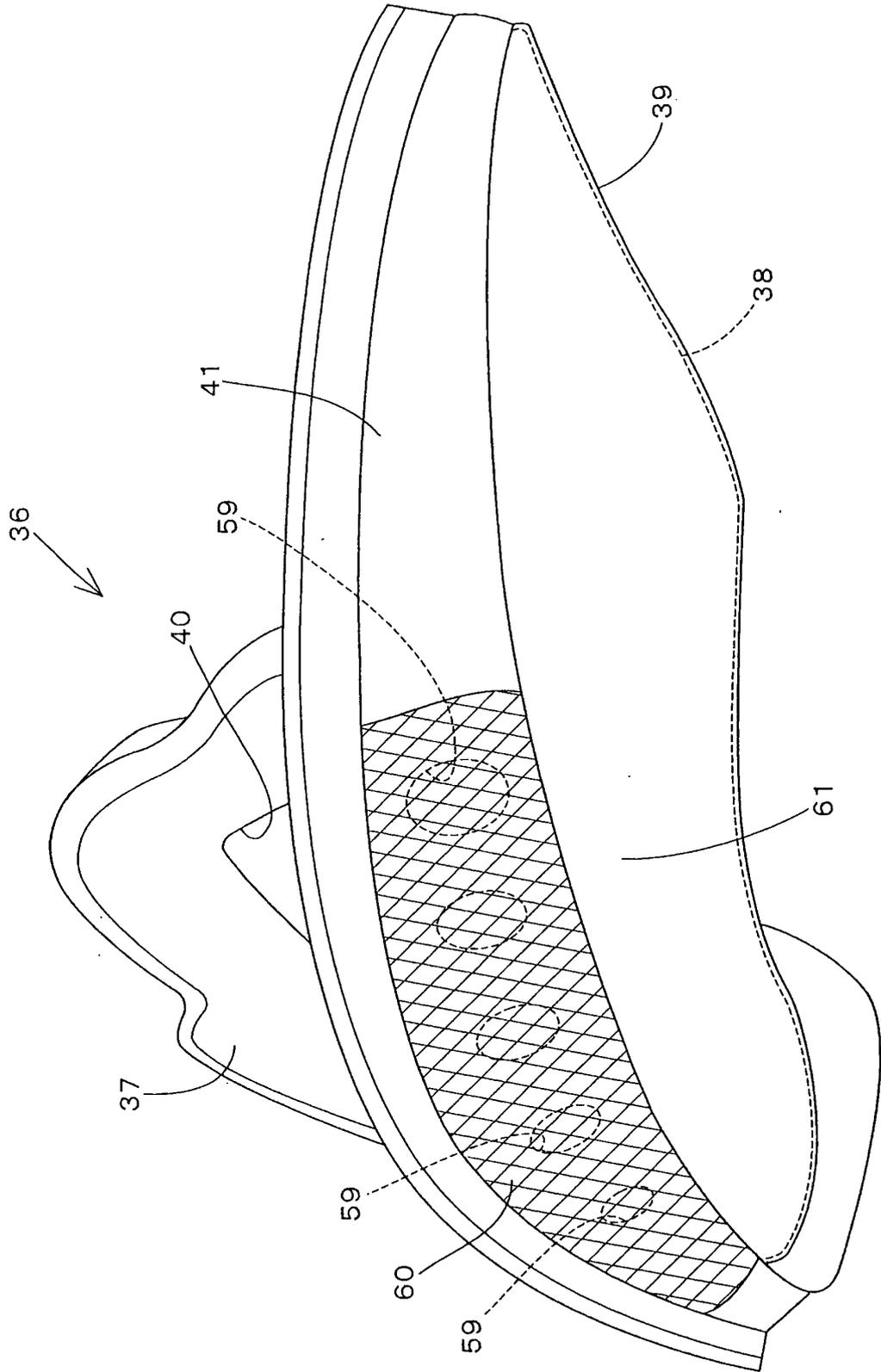
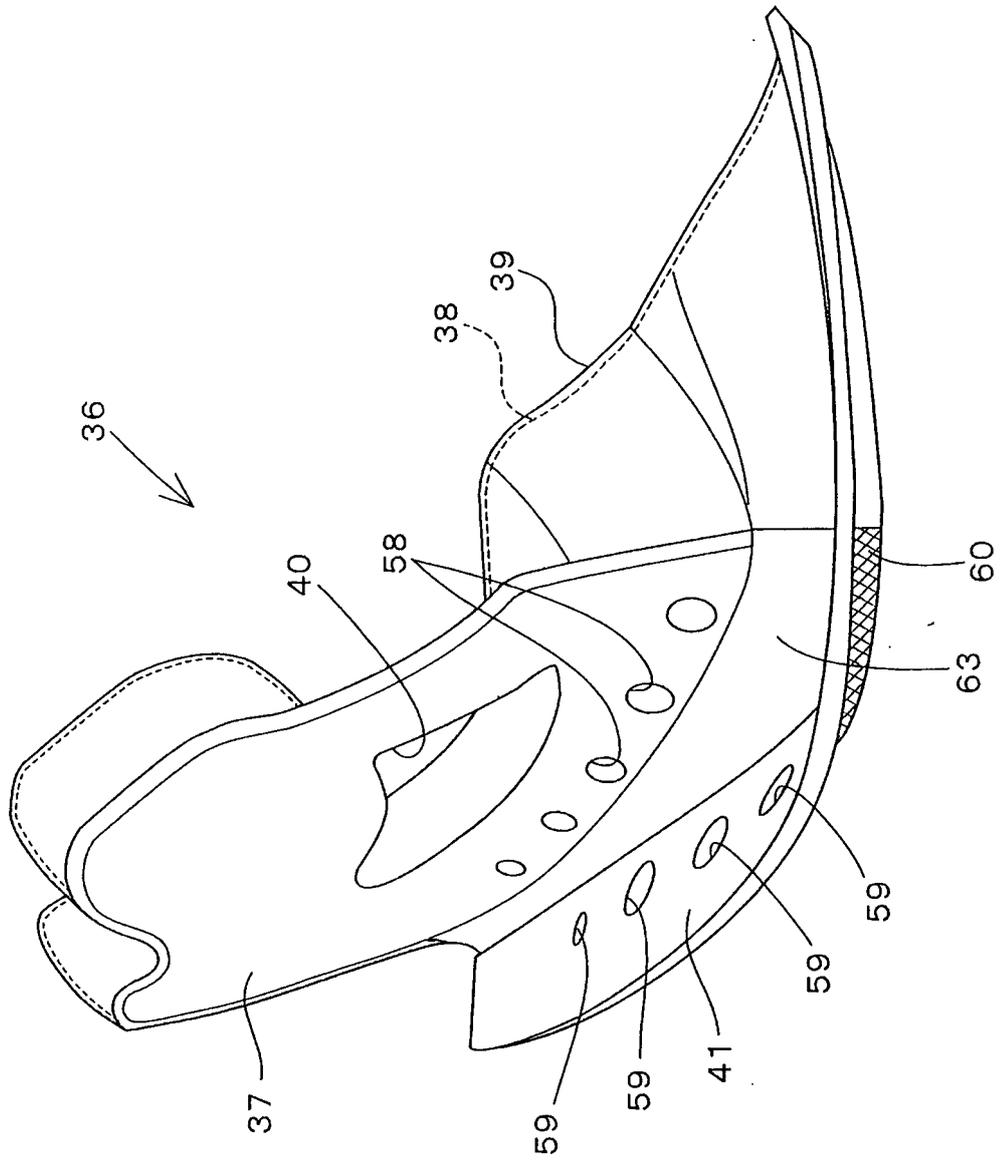


Fig.8



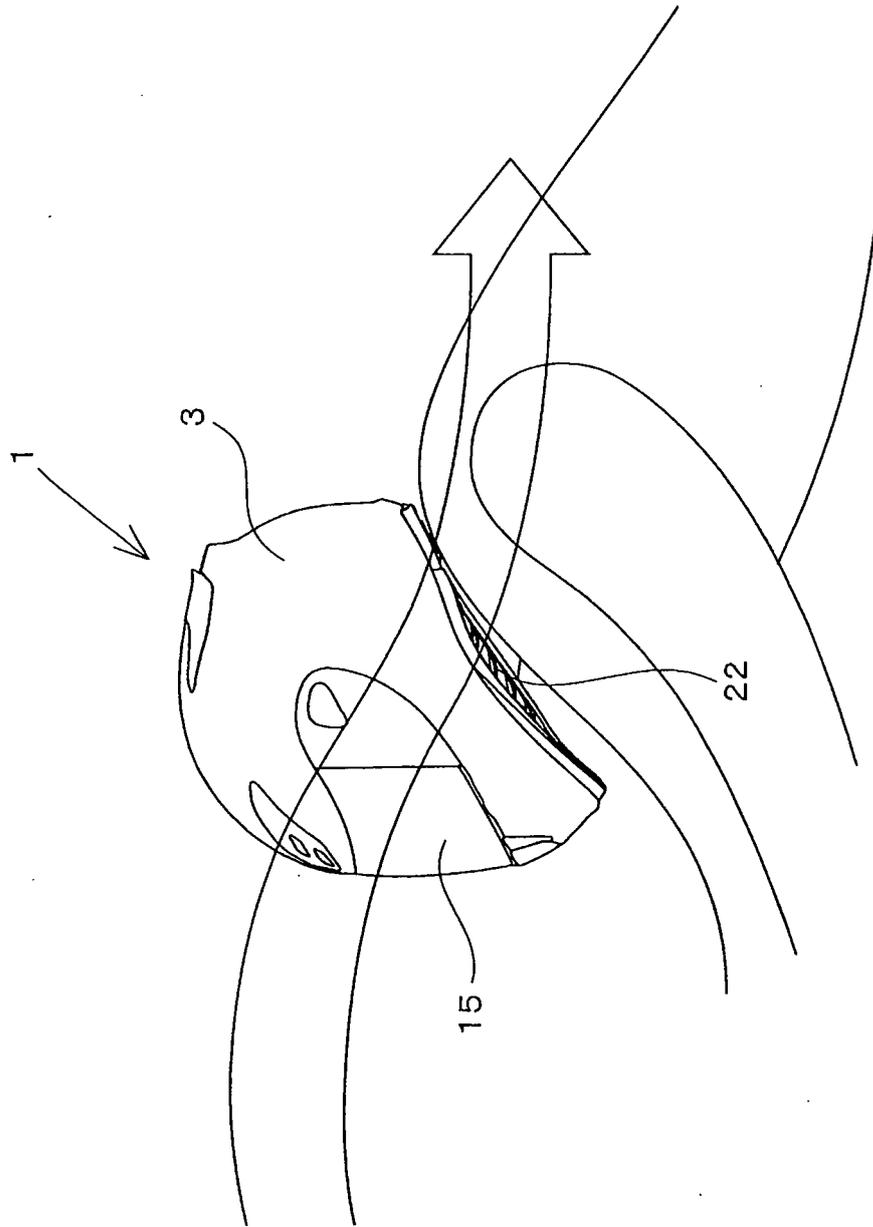


Fig.9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/075462

5	A. CLASSIFICATION OF SUBJECT MATTER A42B3/28 (2006.01) i	
	According to International Patent Classification (IPC) or to both national classification and IPC	
10	B. FIELDS SEARCHED	
	Minimum documentation searched (classification system followed by classification symbols) A42B3/28	
15	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2012 Kokai Jitsuyo Shinan Koho 1971-2012 Toroku Jitsuyo Shinan Koho 1994-2012	
	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)	
20	C. DOCUMENTS CONSIDERED TO BE RELEVANT	
	Category*	Citation of document, with indication, where appropriate, of the relevant passages
		Relevant to claim No.
25	A	JP 10-168639 A (Arai Helmet Ltd.), 23 June 1998 (23.06.1998), entire text; all drawings (Family: none)
30	A	JP 63-50510 A (Tokyu Construction Co., Ltd.), 03 March 1988 (03.03.1988), entire text; all drawings (Family: none)
35		
40	<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.	
45	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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 "&" document member of the same patent family
50	Date of the actual completion of the international search 13 January, 2012 (13.01.12)	Date of mailing of the international search report 24 January, 2012 (24.01.12)
	Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
55	Facsimile No.	Telephone No.

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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 18034/1989 (Laid-open No. 110634/1990) (AuBEX Corp.), 04 September 1990 (04.09.1990), entire text; all drawings (Family: none)	1-15

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 7197305 A [0004]
- JP 1995 A [0004]