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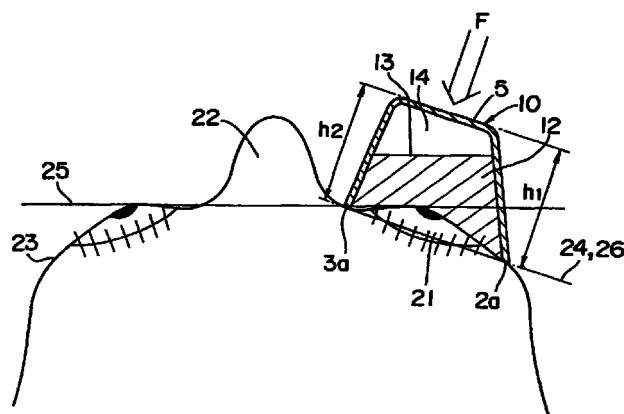
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(54) **EYE WASHING CUP**

(57) A structure that prevents leakage of an eye-wash liquid even if a swimming goggle type eyecup is used to fit the periphery of the eye with the user's face up. The cup 10 for washing user's eye constructed of a peripheral wall 4 and a bottom wall 5 connected to the bottom portion of the peripheral wall 4. An eye contacting peripheral edge part 1 is a swimming goggle type and is able to be made to closely fit the user's eye socket. When the eyecup is used, a peak-to-peak plane 26 being parallel to the bottom wall 5 of the eyecup 10 becomes parallel to a relative-to-face inclined plane 24. If a force F is applied perpendicularly to the bottom wall 5, then the force F is uniformly applied to the periphery of the eye socket to make the eyecup 10 closely and uniformly fit the eye socket.

Fig. 5



Description

TECHNICAL FIELD

[0001] The present invention relates to an eyecup for washing a user's eye by filling the eyecup with an eyewash liquid and by pressing the eyecup against a periphery of the user's eye.

BACKGROUND ART

[0002] Conventionally, there have been provided a variety of eyecups of this type. When using such an eyecup, fluid-tightness between its rim portion (peripheral part) and the periphery of the eye is important in preventing the leak of the eyewash liquid. In order to satisfy the requirement of fluid-tightness, there is provided an eyecup of which the rim portion has generally the same shape as that of a swimming goggle. One example is shown in Fig. 1 through Fig. 3.

[0003] This eyecup 10 is constructed of a peripheral wall 4 and a bottom wall 5 connected with the peripheral wall 4 generally in a crown-like shape. The upper edge of the peripheral wall 4, or an eye contacting peripheral edge part (orbit-contoured-part contacting peripheral edge part) 1 is made laterally asymmetrical, similarly to the eye contacting peripheral edge part of the swimming goggle, in correspondence with the shape of user's eye socket (orbit) when viewed from the side as shown in Fig. 1A, and it is formed into an egg-like shape when viewed from the top as shown in Fig. 1B. That is, the radius of curvature of the curve of the user's eye tail side half-peripheral edge portion (semiperipheral edge part on an eye tail side) 2 is reduced, and the radius of curvature of the curve of the tear duct side half-peripheral edge portion (semiperipheral edge part on a tear duct side) 3 is increased. The height "h1", from the bottom wall 5, of a peak 2a positioned generally at the center of the eye tail side half-peripheral edge portion 2 is made higher than the height "h2", from the bottom wall 5, of a peak 3a positioned generally at the center of the tear duct side half-peripheral edge portion 3. Therefore, a peak-to-peak plane 26 that includes the peak 2a and the peak 3a is inclined with respect to the bottom wall 5.

[0004] However, the conventional swimming goggle type eyecup as shown in Fig. 1 has the following problems. As shown in Fig. 2, the eyecup 10 is used to be pressed lightly around the periphery of the eye socket of a face 23, with the bottom wall 5 being pressed with fingers. In this stage, the bottom wall 5 of the eyecup 10 is generally parallel to the front 25 of the face as shown in Fig. 2. A force being applied to the eyecup 10 is normally in a direction perpendicular to the bottom wall 10 of the eyecup 5 (the direction of arrow "F" in Fig. 2), and the force is applied in the direction generally perpendicular to the front 25 of the face. However, the eye tail side of the eye socket is located backward aslant relative to the tear duct side. Therefore, even if the force "F" is

applied in the direction generally perpendicular to the front 25 of the face, the force is difficult to be exerted on a portion around the peak 2a of the eye tail side half-peripheral edge portion 2. Therefore, it is difficult to make the conventional eyecup 10 closely fit the eye socket. As shown in Fig. 3, if the eyecup 10 is made to fit the periphery of the eye socket by a hand 11 with the user's face up, then the eyewash liquid 12 sometimes disadvantageously leaks from near the periphery of the tail of the eye.

[0005] Furthermore, when washing eye with the eyecup 10 which is placed on a table 15 as shown in Fig. 6A, a large space 14 is formed above the liquid surface 13 of the eyewash liquid 12. Therefore, the eye tail side of the eyeball 21 scarcely comes in contact with the liquid surface 13, as a consequence of which the eye washing cannot be achieved. Furthermore, the table comes close to the very front of the user's face, and the user's nose 22 is about to come in contact with the table 15. Therefore, the user feels oppressively or unpleasantly.

DISCLOSURE OF THE INVENTION

[0006] Accordingly, a main object of the present invention is to realize a structure in which the leakage of the eyewash liquid is prevented at time of using this type of eyecup.

[0007] Another object of the present invention is to realize the structure in which a formation of any large space is prevented above the liquid surface of the eyewash liquid when the eye is washed with this type of eyecup being placed on a table.

[0008] Still another object of the present invention is to realize the structure that gives neither oppressive feeling nor unpleasant feeling to the user when the eye is washed with this type of eyecup being placed on the table.

[0009] In order to achieve the above objects, the present invention provides an eyecup having the following construction.

[0010] In detail, this eyecup comprises a peripheral wall and a bottom wall connected to a bottom part of the peripheral wall, wherein the peripheral wall has an upper edge formed as an eye contacting peripheral edge part which is of a type of a swimming goggle, and wherein the eye contacting peripheral edge part has a generally semioval-shaped semiperipheral edge part on an eye tail side and has a generally semioval-shaped semiperipheral edge part on a tear duct side, characterized in that a height of an apex locating generally at a center of the semiperipheral edge part on the eye tail side, relative to the bottom wall, is substantially equal to a height of an apex locating at a center of the semiperipheral edge part on the tear duct side, relative to the bottom wall.

[0011] Here, the swimming goggle type eye contacting peripheral edge part means an eye contacting periph-

eral edge part having a shape that corresponds to the shape of the user's eye socket and is made to fit the periphery of the eye when the eyecup is used.

[0012] According to the above construction, the height of the peak of the eye tail side half-peripheral edge portion and the height of the peak of the tear duct side half-peripheral edge portion, from the bottom wall, are generally equal to each other. Therefore, the plane that includes the peak of the eye tail side half-peripheral edge portion and the peak of the tear duct side half-peripheral edge portion is substantially parallel to the bottom wall.

[0013] By the way, in general, with regard to the human eye socket, the eye tail side is located backward aslant relative to the tear duct side. Therefore, the plane that includes the eye tail side and the tear duct side is inclined relative to the front of the user's face, forming a so-called relative-to-face inclined plane.

[0014] Therefore, if the eyecup having the above construction is lightly pressed against the periphery of the eye socket of the face when used, then the bottom wall of the eyecup becomes generally parallel to the relative-to-face inclined plane. The user normally applies a force in the direction perpendicular to the bottom wall of the eyecup. Consequently, the force is applied in the direction inclined relative to the front of the user's face, i.e., generally in the direction perpendicular to the relative-to-face inclined plane. Then, the force is uniformly applied to the eye contacting peripheral edge part, i.e., the periphery of the eye socket. Therefore, the eye contacting peripheral edge part of the eyecup can be made closely and uniformly fit the eye tail side and the tear duct side of the eye socket. Even if the eyecup is made to fit the periphery of the eye socket with the user's face up, the eyewash liquid does not leak from the periphery of the eye tail.

[0015] Furthermore, according to the above construction, almost no space is formed above the liquid surface of the eyewash liquid on the peak side of the eye tail side half-peripheral edge portion. Therefore, if eye washing is performed in the above state, then the eye tail side of the eyeball easily comes in contact with the liquid surface, allowing the eyeball to be washed.

[0016] Furthermore, according to the above construction, when eye washing is performed with the eyecup placed on a table, the user uses the eyecup with the user's face tilted sidewise. Accordingly, there occurs neither the case of the table coming close to the very front of the user's face nor the case of the user's nose coming in contact with the table. Consequently, the user does not feel oppressively or unpleasantly.

[0017] According to an eyewash method for performing eye washing with the eyecup placed on a table, even if the eyecup should lose its fluid-tightness to the periphery of the eye socket, then the face does not become wet with the eyewash liquid.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Figs. 1A, 1B and 1C show a side view, a plan view and a perspective view, respectively, of a conventional eyecup;

Fig. 2 is an explanatory sectional view showing a state in which the conventional eyecup is used to fit a periphery of the eye with the user's face up;

Fig. 3 is an explanatory perspective view showing a state in which the conventional eyecup is used to fit the periphery of the eye with the user's face up;

Figs. 4A, 4B and 4C show a side view, a plan view and a perspective view, respectively, of an eyecup according to one embodiment of the present invention;

Fig. 5 is a schematic sectional view showing a state in which the eyecup of Fig. 4 is made to fit the periphery of the eye with the user's face up; and

Figs. 6A and 6B show an explanatory sectional view of a state in which the eyecup of Fig. 1 is placed on a table and is attached with the user's face down, and an explanatory sectional view of a state in which the eyecup of Fig. 4 is placed on the table and is attached with the user's face down, respectively.

BEST MODE FOR CARRYING OUT THE INVENTION

[0019] One embodiment of the present invention will be described below in detail with reference to Fig. 4 through Fig. 6.

[0020] Figs. 4A, 4B and 4C show a side view, a plan view and a perspective view, respectively, of an eyecup according to one embodiment of the present invention. In the figures, an eyecup 10 is a vessel (container, receptacle) which is constructed of a peripheral wall 4 and a bottom wall 5 connected with a bottom portion of the peripheral wall 4. The bottom wall 5 is made generally flat and formed generally into an oval shape or a circular shape. This bottom wall 5 may be provided with a projection against which the user's finger abuts, a rim-like raised ring wall or the like.

[0021] An upper edge of the peripheral wall 4 is formed into an eye contacting peripheral edge part 1 of a swimming goggle type, similar to that of the aforementioned prior art example (Fig. 1). That is, this eye contacting peripheral edge part 1 is formed into an arc-like shape when viewed from the side as shown in Fig. 4A and is formed into an egg-like shape when viewed from the top as shown in Fig. 4B. In this case, the egg-like shape is a shape such that the eye tail side half-peripheral edge portion 2 and the tear duct side half-peripheral edge portion 3 generally have semioval shapes and such that the radius of curvature of the former is smaller than that of the latter, so as to well fit closely around the eye socket. The center portions of the eye tail side half-

peripheral edge portion 2 and the tear duct side half-peripheral edge portion 3 form the highest peaks 2a and 3a, respectively, with respect to the bottom wall 5. These peaks 2a and 3a are dimensionally constructed so that their heights "h1" and "h2" with respect to the bottom wall 5 are substantially equal to each other. Therefore, a peak-to-peak plane 26 that includes the peak 2a of the eye tail side half-peripheral edge portion 2 and the peak 3a of the tear duct side half-peripheral edge portion 3 is made substantially parallel to the bottom wall 5.

[0022] The peripheral wall 4 expands in a tapered form from the bottom wall 5 toward the eye contacting peripheral edge part 1. In particular, the peripheral walls near the peaks 2a and 3a of the eye tail side half-peripheral edge portion 2 and the tear duct side half-peripheral edge portion 3 are inclined more outwardly. By forming the peripheral wall 4 into such a shape, the quantity of an eyewash liquid 12 to be filled in the eyecup 10 can be reduced, as compared with the construction of a cylindrical peripheral wall or the like.

[0023] Next, how to use the eyecup 10 having the above construction will be described below.

[0024] Fig. 5 is a schematic sectional view of a state in which the eyecup 10 of Fig. 4 is made to fit the periphery of the eye with the user's face up. In the state of Fig. 5, the eye tail side half-peripheral edge portion 2 and the tear duct side half-peripheral edge portion 3 of the eyecup 10 are made to abut against the eye tail side and the tear duct side, respectively, of the eye socket of the face 23. As described hereinabove in connection with the prior art example, the human eye socket is generally made so that the eye tail side is shaped backward aslant relative to the tear duct side. Therefore, the plane that includes the eye tail side and the tear duct side is inclined relative to the front 25 of the face, forming a so-called relative-to-face inclined plane 24.

[0025] The eyecup 10 having the above construction is generally used with its being filled with a quantity of eyewash liquid 12, the quantity being about half the total capacity of the eyecup. Eye washing is performed by lightly pressing the eyecup 10 against a flesh portion around the eye socket of the face 23 with the face down, by leaning back the head to direct the face upwards while pressing the eyecup 10 so as not to spill the liquid outside, and by blinking the eye several times.

[0026] In this stage, the bottom wall 5 generally parallel to the peak-to-peak plane 26 that includes the peaks 2a and 3a of the eyecup 10 is inclined relative to the front 25 of the face; however, the bottom wall 5 becomes generally parallel to the relative-to-face inclined plane 24. The user generally applies the force "F" in the direction perpendicular to the bottom wall 5 of the eyecup 10 as his/her natural action. The applied force "F" is inclined relative to the front 25 of the face; however, it is exerted generally in the direction perpendicular to the relative-to-face inclined plane 24. Then, the uniform force "F" is applied to the eye contacting peripheral

edge part 1 and also to the periphery of the eye socket. Consequently, the eye tail side half-peripheral edge portion 2 and the tear duct side half-peripheral edge portion 3 of the eyecup 10 can be made to evenly and closely fit the flesh portion located on the eye tail side and the tear duct side of the face 23. Therefore, when the eyecup 10 is made to fit the periphery of the eye socket with the user's face up, the eyeball 21 can be washed with the eyewash liquid 12 without leaking the eyewash liquid 12 from the periphery of the tail of the eye.

[0027] The eyecup 10 of Fig. 4 can also be used while being placed on a table 15 with a state in which it is almost filled with the eyewash liquid 12 as shown in Fig. 6B. In this stage, the liquid surface 13 of the eyewash liquid 12 becomes substantially parallel to the bottom wall 5 of the eyecup 10 and the peak-to-peak plane 26 that includes the peaks 2a and 3a, and it comes into the same level as that of the user's relative-to-face inclined plane 24. Therefore, the space 14 is scarcely formed above the liquid surface 13 of the eyewash liquid 12 at the eye tail side half-peripheral edge portion 2a. If the eye washing is performed under the above state, the eye tail side of the eyeball 21 is easily brought in contact with the liquid surface 13, allowing the eyeball 21 to be washed.

[0028] According to the aforementioned manner of how to use it, the user's relative-to-face inclined plane 24 and the table 15 become parallel to each other, and therefore, the user uses the eyecup with the user's face tilted sidewise. Accordingly, there occurs neither the situation in which the table 15 comes close to the very front of the user's face, nor the situation in which the user's nose 22 comes in contact with the table. Consequently, the user does not feel oppressively or unpleasantly.

[0029] Furthermore, it goes without saying that the above way of how to use it has the effect to prevent the face from becoming wet with the eyewash liquid 12 even if the eyecup does not contact the periphery of the eye socket closely.

[0030] With regard to the eyecup 10, it is preferable to provide the inner surface of the peripheral wall 4 or the bottom wall 5 of the eyecup 10 with an engagement portion (not shown) so that the eyecup 10 engages in a cover-like style with a cap portion of a body of the vessel in which the eyewash liquid 12 is provided, allowing the eyecup to be fixed to the body of the vessel.

Claims

1. An eyecup which comprises a peripheral wall (4) and a bottom wall (5) connected to a bottom part of the peripheral wall (4), wherein the peripheral wall (4) has an upper edge formed as an eye contacting peripheral edge part (1) which is of a type of a swimming goggle, and wherein the eye contacting peripheral edge part (1) has a generally semioval-shaped semiperipheral edge part (2) on an eye tail

side and has a generally semioval-shaped semiperipheral edge part (3) on a tear duct side,

characterized in that a height (h1) of an apex (2a) generally locating at a center of the semiperipheral edge part (2) on the eye tail side, relative to the bottom wall (5), is substantially equal to a height (h2) of an apex (3a) locating at a center of the semiperipheral edge part (3) on the tear duct side, relative to the bottom wall (5).

2. An eye washing method for washing a user's eye, with a state in which an eyecup (10) generally filled with an eyewash liquid (12) is placed on a table (15),

characterized in that the eyecup (10) is pressed around the user's eye with a state in which the user's face is tilted sideways,

that the eyecup (10) comprises a peripheral wall (4) and a bottom wall (5) connected to a bottom part of the peripheral wall (4),

that the peripheral wall (4) has an upper edge formed as an eye contacting peripheral edge part (1) which is of a type of a swimming goggle,

that the eye contacting peripheral edge part (1) has a generally semioval-shaped semiperipheral edge part (2) on an eye tail side and has a generally semioval-shaped semiperipheral edge part (3) on a tear duct side, and

that a height (h1) of an apex (2a) generally locating at a center of the semiperipheral edge part (2) on the eye tail side, relative to the bottom wall (5), is substantially equal to a height (h2) of an apex (3a) locating at a center of the semiperipheral edge part (3) on the tear duct side, relative to the bottom wall (5).

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Fig. 1A

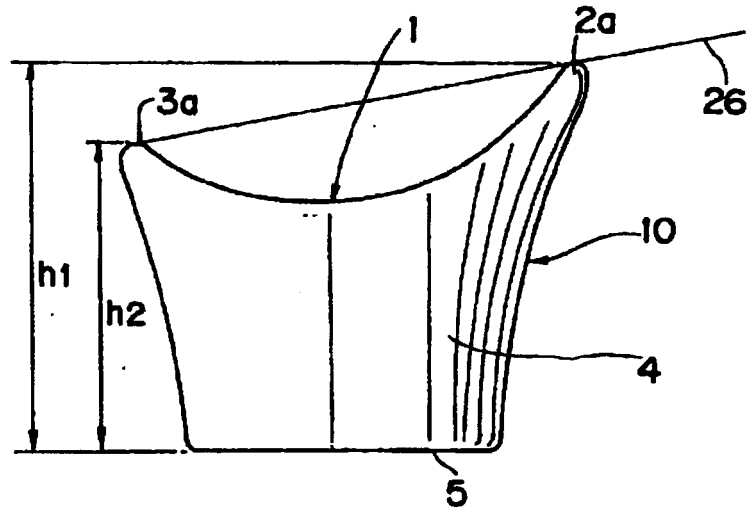


Fig. 1B

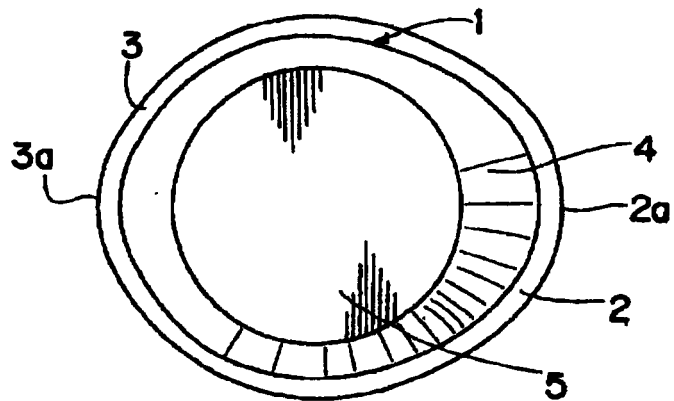


Fig. 1C

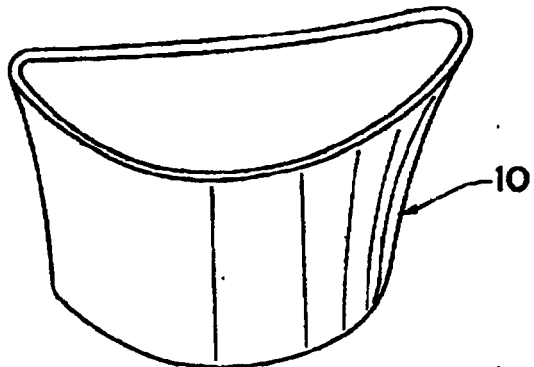


Fig. 2

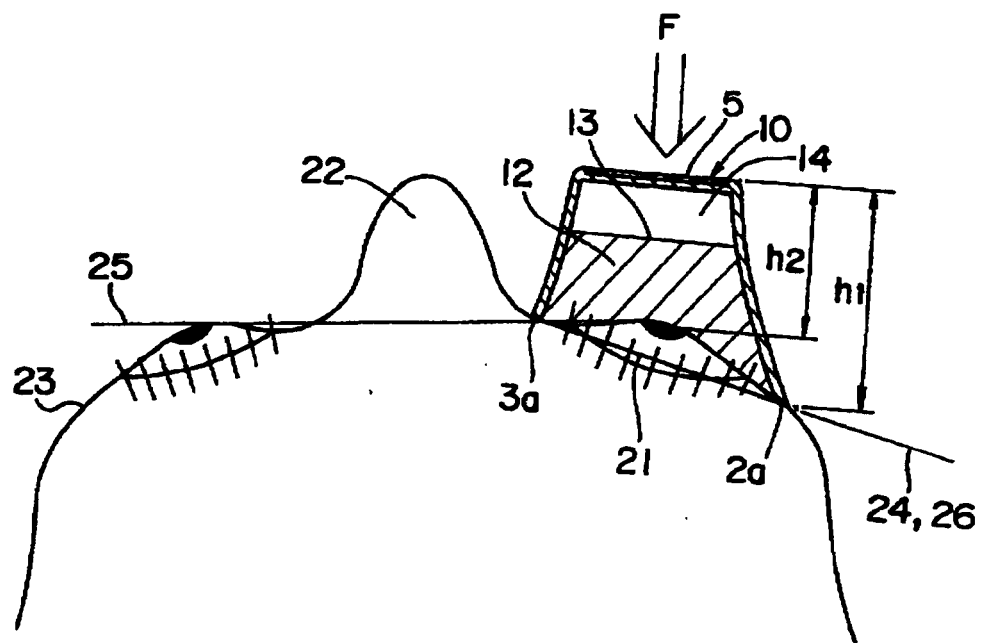


Fig. 3

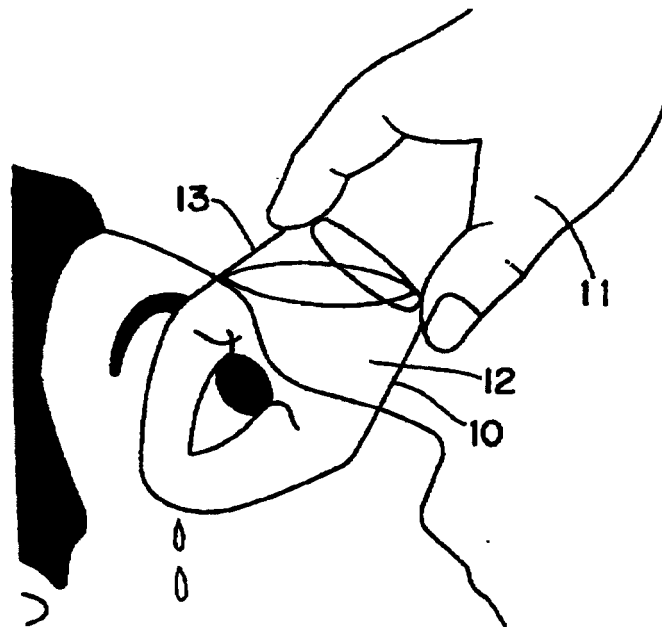


Fig. 4A

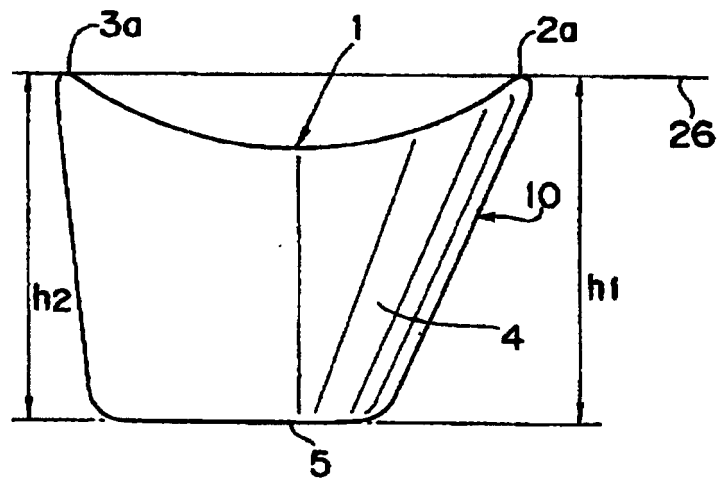


Fig. 4B

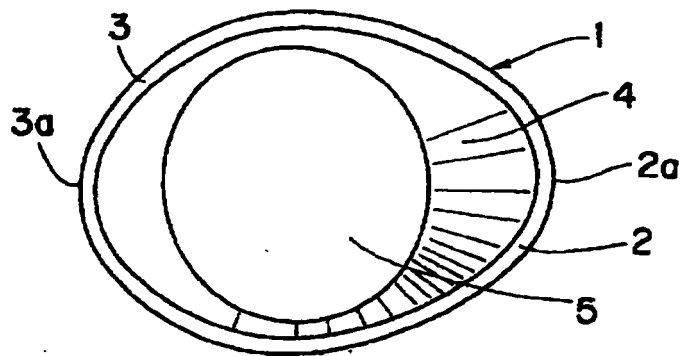


Fig. 4C

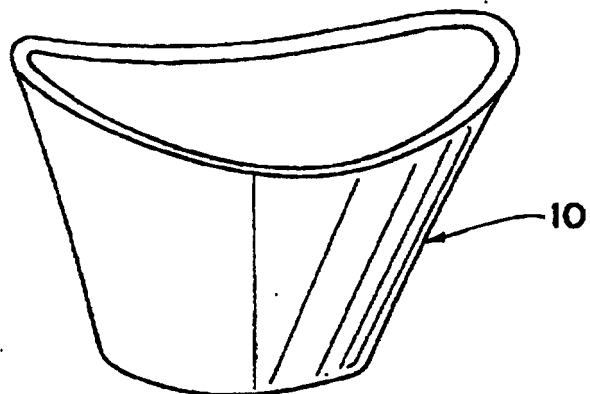


Fig. 5

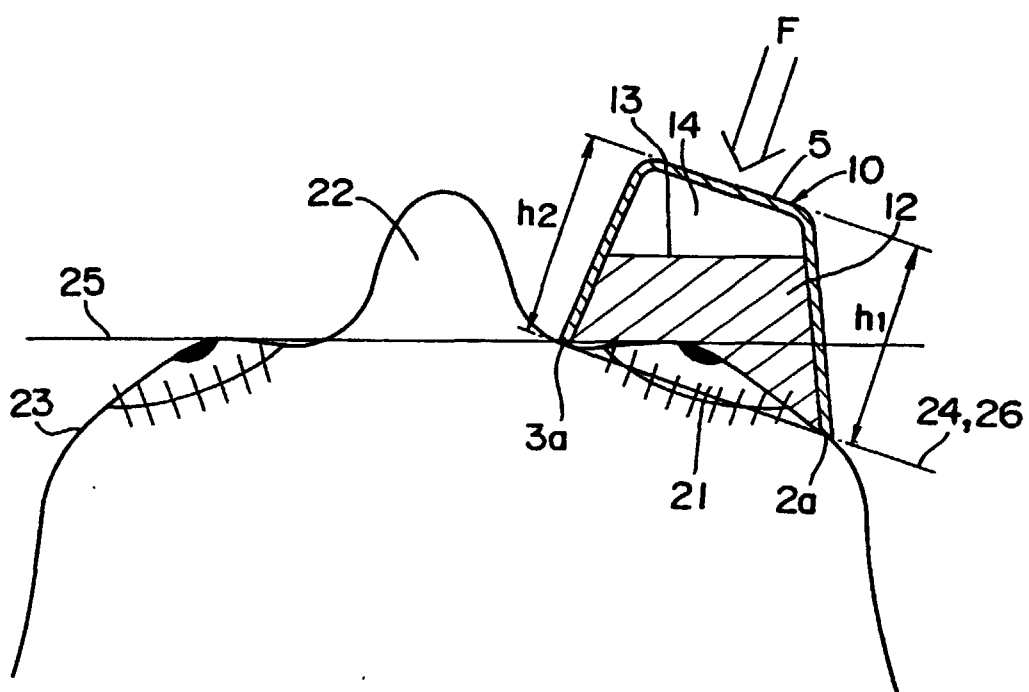


Fig.6A

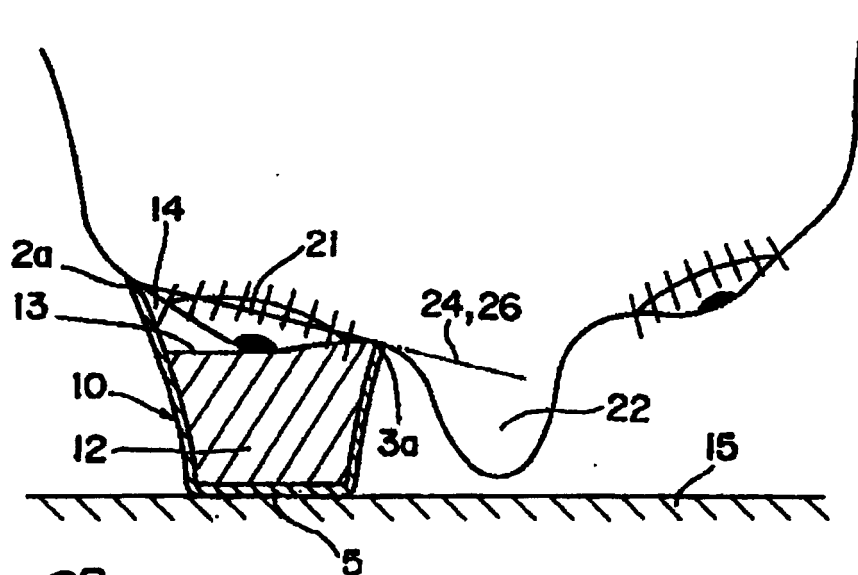
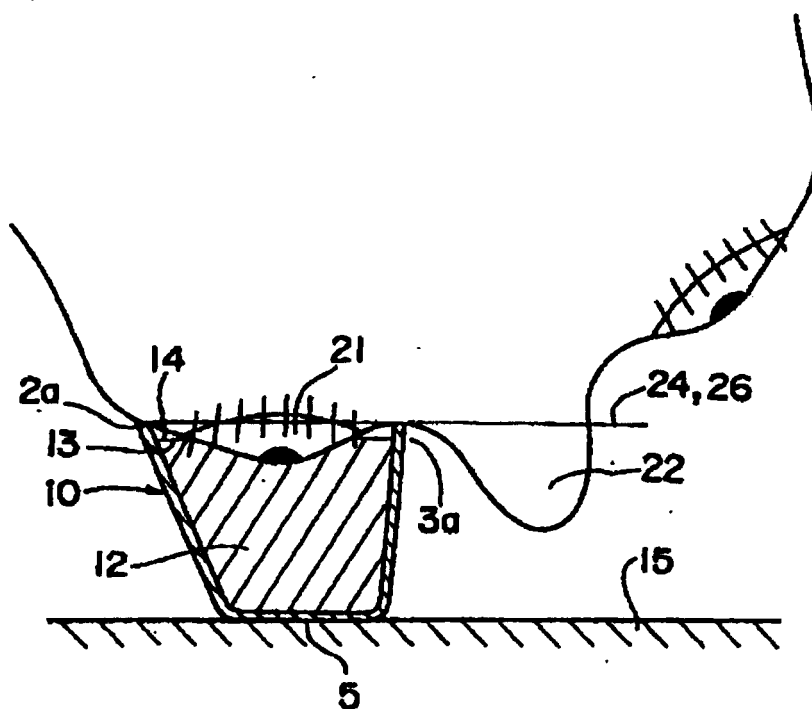


Fig.6B



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP99/01504

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. ⁶ A61H35/02		
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) Int.Cl. ⁶ A61H35/02		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-1999 Kokai Jitsuyo Shinan Koho 1971-1999 Jitsuyo Shinan Toroku Koho 1996-1999		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CD-ROM of Japanese Utility Model Application No. 4-42708 (Laid-open No. 5-93439) (Tadashi Matsumoto), 21 December, 1993 (21. 12. 93), Figs. 1, 5 (Family: none)	1, 2
Y	JP, 6-9646, Y2 (Yoshino Kogyosho Co., Ltd.), 16 March, 1994 (16. 03. 94), Fig. 1 (Family: none)	1, 2
Y	JP, 60-222056, A (Masayuki Chibana), 6 November, 1985 (06. 11. 85), Fig. 5 (Family: none)	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 "E" earlier document 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		
Date of the actual completion of the international search 22 June, 1999 (22. 06. 99)		Date of mailing of the international search report 29 June, 1999 (29. 06. 99)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)