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(54) Titel: **FACE SHIELD**

(56) Fremdragne publikationer:
US 2012/0047614 A1
US 2016/0143378 A1
JP 3227844 U

(57) Sammendrag:
The invention relates to a face shield and a sheet configured for use in the face shield, where the sheet is transparent and flexible, which sheet comprises a substantially plane main body (1) bounded by a bottom edge portion (3), a left and right side edge portion (4L, 4R) and a top edge portion (5) and respective left and right corner portions (9, 10) connecting the respective side portion (4L, 4R) with the top portion (5), wherein the sheet comprises through-openings (7, 8) configured such that a strap or band (20, 12; 22, 23) can pass through these through-openings (7, 8), wherein the corner portions (9, 10) comprises an outward extension or tongue (11, 15) having an edge that forms a gap (12; 18, 19) between the extension or tongue (11, 15) and the main body of the sheet (1), where the through-openings (7, 8) are positioned such that said strap or band (20, 21; 22, 23) can pass from the through-opening (7, 8) and through the gap (12; 19, 19), whereby the sheet (1) of the face shield can be locked in a tilted position characterized by a tilt angle (α) relative to the forehead of a user of the face shield.

Fortsættes...

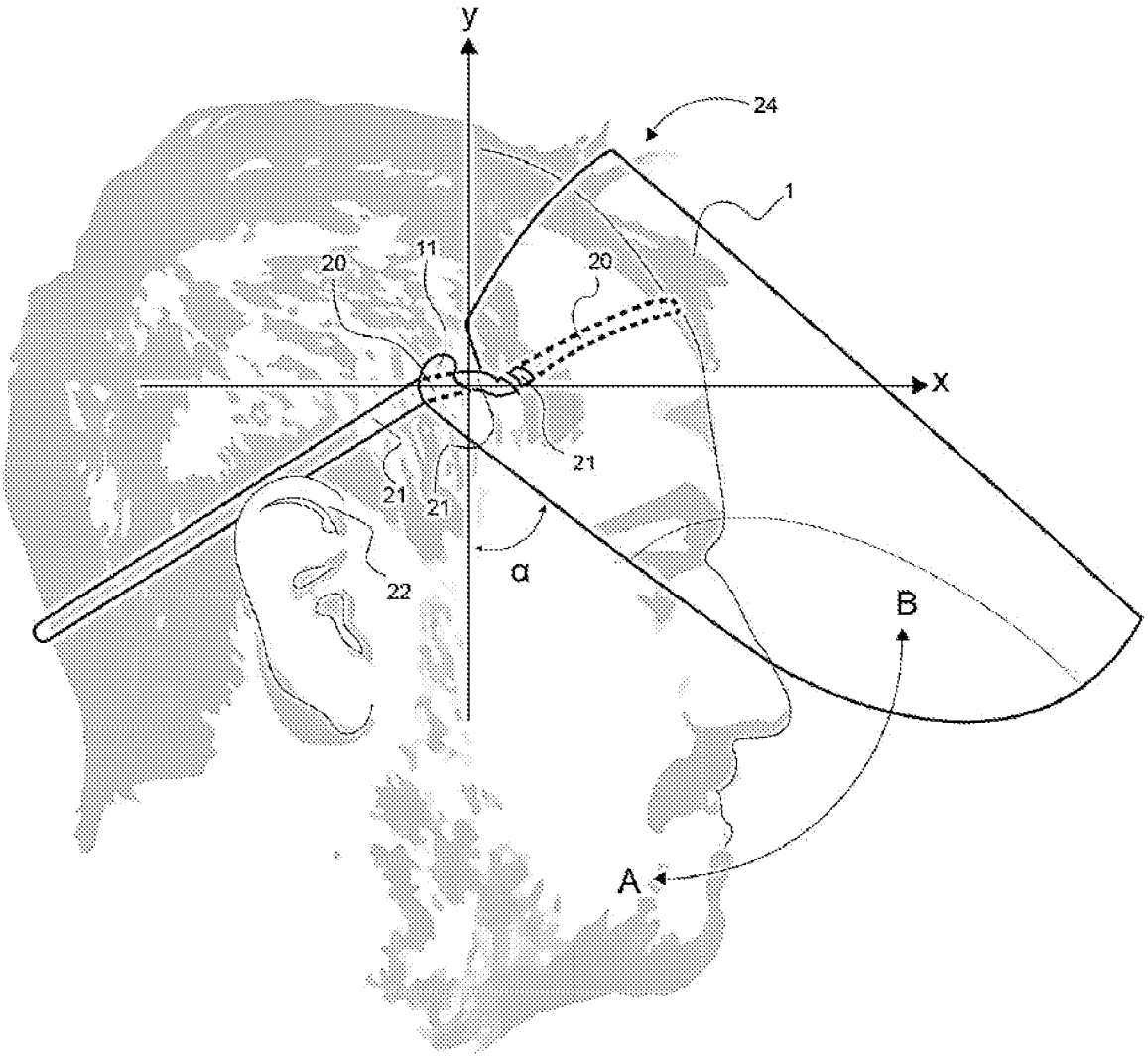

Fig. 5

A FACE SHIELD

TECHNICAL FIELD

The present invention relates generally to protective shields configured to cover the face of a user, for instance to avoid the risk of contagious infection under epidemics, and more specifically to simple and cheap/economic face shields, the orientation of which relative to the face of a user can be varied by simple means incorporated into the material of the protective shield.

BACKGROUND OF THE INVENTION

There are a number of face shields commercially available at present but generally they do not provide the possibility to vary the orientation of the face shield relative to the forehead of the user without the incorporation of more complicated means into the face shield. It is however important to have access to a face shield that allows to easily adjust the distance to the forehead, thereby allowing for instance more air flow to the forehead of the user and/or the wearing of glasses, etc., It should alternatively also be possible to wear the face shield close to the forehead and to combine it with hats or other accessories. Furthermore, it may be important, for example under epidemics, to be able to produce and distribute a large quantity of such face shields with very simple production techniques and at a very low price and still have the advantage of easily adjusting the orientation, (distance and tilting) of the face shield relative to the forehead of the user and providing the same features/usage possibilities that most professional face shields provide.

OBJECT OF THE INVENTION

On the above background, it is an object of the present invention to provide a simple and cheap face shield with variable distance and tilt angle orientation relative to the forehead of the user.

DISCLOSURE OF THE INVENTION

According to the invention, the above and further objectives objectives and advantages are obtained by a face shield that is based on a standard transparent sheet (PVC / Pet sheet/ PETG/ overhead transparency, etc.) in A4 (210 x 297 mm) or Letter (216 x 279 mm) size/ format where the actual size can easily be optimized.

Some of the main features of the present invention are:

- simplicity of construction: only an elastic strap and a transparent standard-sized sheet of a suitable transparent material such as PET is needed as minimum requirements.
- production capacity: due to the simplicity of the design, thousands can be produced per day.
- it allows easy adjustment, without the need for extra elements. (Standard human head circumference varies between 52 and 56 cm). Depending of the elastic quality of the strap, it is possible to use a universal size of 52 cm,

Alternatively, the elastic strap therefor can be either adapted to that length, or have a simple option of length adjustment with knots, heat or a very simple seal, staple etc.

Optionally the strap can be enhanced with other elements, such as a more sophisticated closing and adjusting system, push button cinch, Velcro, etc.

- the distance to the forehead can be easily adjusted thanks to rubber bands passing to the hole/s), thus allowing more air flow, wearing glasses, etc. but can alternatively also be worn close to the forehead and be combined with other hats or accessories.

Further, another very important feature is that the configuration of the face shield according to the present invention allows to the face shield to be tilted upwards relative to the foreface of the user and to keep it tilted upwards thanks to a system of hooks, which are integrated in the same transparent sheet, thereby saving unnecessary materials and production costs. Also, this feature provides more comfort to the user, since it is not necessary to remove it from the head of the user, when the maximum protective effect of the face shield is not needed thanks to the flexibility of use provided with the face shield according to the present invention. The face shield of the invention can typically be tilted between a state, in which it extends substantially in parallel with the forehead of the user and a state, in which it is tilted approximately 90 degrees relative to the front face of the user.

According to the invention, there are at least the following construction materials alternatives:

- a standard transparent sheet (PVC / Pet sheet/ PETG overhead transparency, etc.) in A4 (210 x 297 mm), Letter (216 x 279 mm), (200 x 297) or any similar size that allows to do not loose material from the original big sheet size, with a thickness from 0.2 mm to 0.5 mm can be used, although other suitable materials, dimensions and thicknesses may also be used.

- an elastic strap can be provided in the face shield and removably attached to the face shield by clip or closure means.

The above and further objects and advantages are according to a first aspect of the present invention provided by sheet of a flexible and transparent material that is configured for use in a face shield, which sheet comprises a substantially plane main body bounded by a bottom edge portion, a left and right side edge portion and a top edge portion and respective left and right corner portions connecting the respective side portion with the top portion, wherein the sheet comprises through-openings configured such that a strap or band can pass through these through-openings, wherein the corner portions comprises an outward extension or tongue having an edge that forms a gap between the extension or tongue and the main body of the sheet, where the through-openings are positioned such that said strap or band can pass from the through-opening and through the gap, whereby the sheet of the face shield can be locked in a tilted position relative to the forehead of a user of the face shield.

It is possible to use a plurality of through-openings. In one embodiment, which is shown and described in the detailed description of the invention, three such openings are used, but for instance one or two openings could also be used. The chosen number of through-openings depends on the stability requirements of the face shield. It is however important the through-openings are configured such that the the strap or band that passes through these openings can on the one hand be displaced through these openings, and on the other hand that the contact between the strap or band and the edges of the openings is sufficient tight to secure the sheet to the strap or band when the face shield has been fitted to the head of the individual user.

In embodiment of the first aspect, the corner portions comprise more than one of said gaps.

In embodiment of the first aspect, the sheet is constructed from a standard transparent sheet, such as an A4 (210 x 297 mm) or Letter (216 x 279 mm) size sheet.

It is understood that other sizes and shapes of the sheet could also be used in embodiments of the invention.

In embodiment of the first aspect, the thickness of the sheet rages from 0.2 mm to 0.5 mm.

In embodiment of the first aspect, the sheet is of a suitable transparent material such as PVC, PET, PETG or PLA.

In embodiment of the first aspect, the sheet comprises said main body (1) and two side portions.

The above and further objects and advantages are according to a second aspect of the present invention provided by a face shield comprising a flexible and transparent sheet according to the first aspect, and furthermore provided with a strap or band configured to secure the sheet to the head of a user, wherein the strap or band is attached to the sheet by passing through said through-openings and where the strap or band is configured to be able to fit into said gap formed between the extension or tongue and the main body of the sheet.

BRIEF DESCRIPTION OF THE DRAWINGS

Further benefits and advantages of the present invention will become apparent after reading the detailed description of non-limiting exemplary embodiments of the invention in conjunction with the accompanying drawings, wherein

figure 1 shows a plane view of a transparent sheet used for the face shield according to a first embodiment of the invention;

figure 2 shows a plane view of a transparent sheet used for the face shield according to a second embodiment of the invention;

figure 3 shows a plane view of the configuration of a corner portion of the transparent sheet shown in figures 1 and 2;

figure 4 shows an alternative configuration of the corner portion;

figure 5 shows a schematic representation of a face shield according to an embodiment of the present invention in a state, in which it is tilted relative to the foreface of a user; and

figure 6(a) and 6(b) show a schematic representation of the face shield shown in figure 5 in the state, in which it is not tilted relative to the forehead of a user and at a position (a) close to the forehead of the user and at a position (b) further away from the forehead of the user.

DETAILED DESCRIPTION OF THE INVENTION

The principles of the invention will be illustrated by various embodiments hereof. It is however understood that a person skilled in the art may conceive other embodiments than those shown and described in the detailed description of the invention and that the scope of the invention is defined by the independent claims.

With reference to figure 1 there is shown a plane view of a transparent sheet used for the face shield according to a first embodiment of the invention. The transparent sheet comprises a main body 1 and side portions 1', where the plane of the two side portions 1' can be inclined relative to the plane of the main portion 1. It is understood that the side portions 1' may be omitted from the sheet, if desired, such that the entire sheet only comprises one portion. The overall shape of the sheet (with the edge 2) may be rectangular (as shown) but other shapes would also fall within the scope of the present invention. The sheet 1, 1' used to form the face shield of the invention comprises a bottom edge 3, side edges 4 and a top edge 5. The bottom edge 3 is connected to the respective side edge by a curved portion 6 extending between point a1 on the bottom portion 3 to point b1 on the left side portion 4L (as seen in the figure) and between point a2 on the bottom portion 3 to point b2 on the right side portion 4R. The points b1 and b2 can be located anywhere on the respective side portions, as desired, and the points a1 and a2 can also be located anywhere on the bottom portion 3. This, in a specific embodiment, a1 may be at the same location as a2, whereby the entire bottom portion becomes curved.

The sheet 1 is provided with through-openings 7, through which a strap can be passes as illustrated in figures 5 and 6, which strap fixes the face sheet to the head of the user.

An essential feature of the face sheet of the present invention is the upper left and right edge portions indicated by reference numerals 9 and 10, respectively, in figures 1 and 2. These edge portions are configured as shown in more detail in figure 3, and are the means that (together a strap passed though the openings 7 (in figure 1) and 8 (in figure 2)) allow the face shield according to the invention to be tilted relative to the forehead of the user. The corner portions will be described in detail in connection with figures 3 and 4 below.

With reference to figure 2 there is shown a plane view of a transparent sheet used for a second embodiment of the face shield according to the invention. The only difference from the embodiment shown in figure a is, that the through-openings 7 in figure 1 has been replaced by circular through-openings in the embodiment shown in figure 2. Different hole shapes are also possible, such as oval, rectangle with circular edges, etc.) for instance depending of the cutting machine used to manufacture the sheet).

With reference to figure 3 there is shown a plane view of the configuration of a corner portion (portion 9 in figures 1 and 2) of the transparent sheet shown in figures 1 and 2. The corner portion connects the side edge 4 with the top edge 5 of the sheet and comprises an outwardly directed extension of tongue 11 comprising gap 12 that can be accessed from outside the

sheet, which gap 12 is bounded by opposing side portions 13 and 14 and dimensioned such that a strap used to hold the face shield to the head of a user can be accommodated in the gap 12. The function of the corner portions 9 and 10 will be illustrated with reference to figures 5 and 6. Using this configuration of the corner portion of the sheet 1, the face shield can be tilted and locked in one tilted position relative to the foreface of the user as shown in figure 5 below.

With reference to figure 4 there is shown an alternative configuration of the corner portion, wherein the extension or tongue 15 provided between the side edge 4 and the top edge 5 is provided with two outwardly open gaps 18 and 19, respectively separated by a portion 17 of the extension or tongue 15. Using this configuration of the corner portion of the face shield can be tilted and locked in two tilted positions relative to the foreface of the user.

With reference to figure 5 there is shown a schematic representation of a face shield according to an embodiment of the present invention generally indicated by reference numeral 24 in a state, in which it is tilted an angle α relative to the foreface of a user, where the foreface is assumed to extend vertically in the direction of the y-axis as shown in figure 5.

A strap 20, 21 such as an elastic band is fitted around the forehead of the user as indicated by 20, i.e. behind the sheet 1 as shown in the figure. Those portions of the strap that extend behind the sheet 1 are shown in broken lines 20, whereas those portions of the strap that extend in front of the sheet 1 are shown in full lines 21. From the forehead of the user, the strap 20 passes through a first of the three through-openings 7 in the sheet (see figure 1) such that it passes in front of the sheet as indicated by 21' in front of the sheet. The strap then passes through the gap 12 described above and under (behind) the extension or tongue 11 as indicated by 20 in figure 5. From the extension or tongue 11, the strap passes around the head of the user, preferably through the region formed between the upper part of the pinna 22 of the user and the user's head. In this position of the sheet, the face shield is prevented from undergoing a downward tilting movement (arrow A) by the locking engagement of the strap with the extension or tongue 11 of the respective corner portion 9 or 10.

Figure 6(a) and 6(b) are shown schematic representations of the face shield shown in figure 5 in the state, in which it is not tilted relative to the forehead of a user (i.e. α approximately equal to zero) and at a position (a) close to the forehead of the user and at a position (b) further away from the forehead of the user. As illustrated, the sheet of the face shield can be displaced as indicated by arrow D to the desired distance relative to the forehead by sliding the sheet over the strap 22, 23 that is passed through the through-openings in the sheet.

The strap 22, 23 passes as in figure 5 around the forehead of the user as indicated by reference 22, i.e. behind the sheet 1, then passes through the through-openings 7 as described above and leaves the last of these openings (the one closest to the pinna of the user) such that it passes in front of the sheet as indicated by 23 in the figure.

The face shield can be tilted from the position shown in figure 6 and as indicated by arrow B (figure 5) to the tilted position shown in figure 5, in which the user passes the strap 22, 23 into the gap 12 formed between the extension or tongue 11 and the main body of the sheet 1, such that it is locked in the tilted position relative to the forehead of the user.

If the embodiment of the corner portion shown in figure 4 is used instead of the corner portion shown in figure 3, it is possible to lock the shield in two different tilted positions relative to the forehead of the user, i.e. in two different values of the angle α shown in figure 5.

It is understood that the shown embodiments of the sheet for forming the face shield according to the invention as well as the face shield consisting of the sheet and a suitable strap can be configured in many other ways that those actually shown and described above, and that these embodiments do not constitute a limitation to the scope of the invention.

CLAIMS

1. A transparent and flexible sheet for a face shield, which sheet comprises a substantially plane main body (1) bounded by a bottom edge portion (3), a left and right side edge portion (4L, 4R) and a top edge portion (5) and respective left and right corner portions (9, 10) connecting the respective side portion (4L, 4R) with the top portion (5), wherein the sheet comprises through-openings (7, 8) configured such that a strap or band (20, 12; 22, 23) can pass through these through-openings (7, 8), wherein the corner portions (9, 10) comprises an outward extension or tongue (11, 15) having an edge that forms a gap (12; 18, 19) between the extension or tongue (11, 15) and the main body of the sheet (1), where the through openings (7, 8) are positioned such that said strap or band (20, 21; 22, 23) can pass from the -through opening (7, 8) and through the gap (12; 19, 19), whereby the sheet (1) of the face shield can be locked in a tilted position characterized by a tilt angle (α) relative to the forehead of a user of the face shield.

2. A sheet according to claim 1, wherein said tilt angle can vary between approximately 0 degrees and approximately 90 degrees relative to the forehead of the user.

3. A sheet according to claim 1 or 2, wherein said corner portions (9, 10) comprise more than one of said gaps.

4. A sheet according to claim 1, 2 or 3, wherein the sheet is constructed from a standard transparent sheet (2), such as an A4 (210 x 297 mm) or Letter (216 x 279 mm) size sheet.

5. A sheet according to any of the preceding claims, wherein the thickness of the sheet rages from 0.2 mm to 0.5 mm.

6. A sheet according to any of the preceding claims, wherein the sheet is of a suitable transparent plastic material such as PVC, PET, PETG, PLA.

7. A sheet according to any of the preceding claims, wherein the sheet comprises said main body (1) and two side portions (1').

8. A face shield comprising a flexible and transparent sheet according to any of the preceding claims 1 to 7 and provided with a strap or band (20, 21; 22, 23) configured to secure the sheet to the head of a user, wherein the strap or band (20, 21; 22, 23) is attached to the sheet (1) by passing through said through-openings (7, 8) and where the strap or band (20, 21; 22, 23) is configured to be able to fit into said gap (12; 18, 19) formed between the extension or tongue (11, 15) and the main body of the sheet (1).

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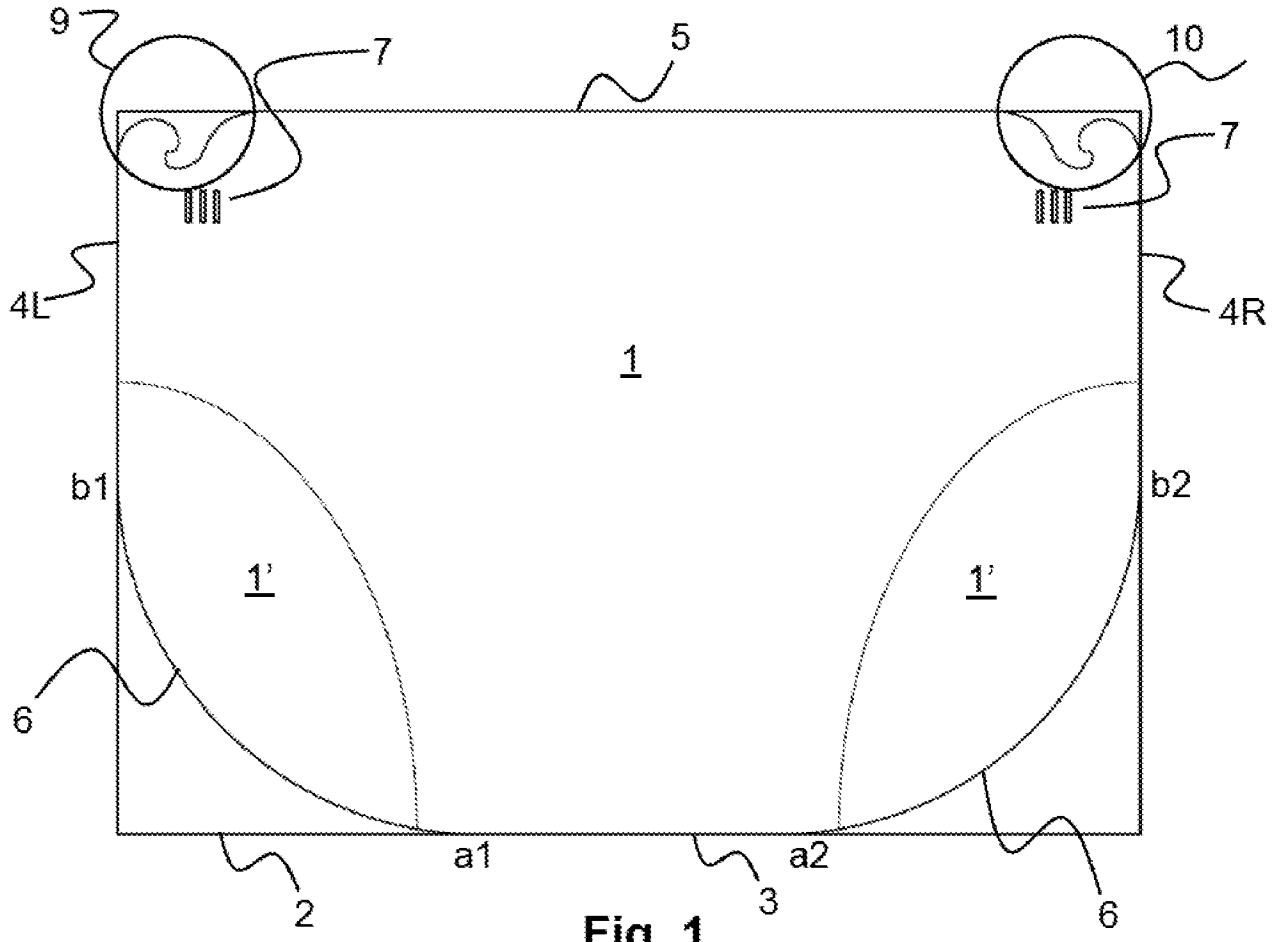

Fig. 1

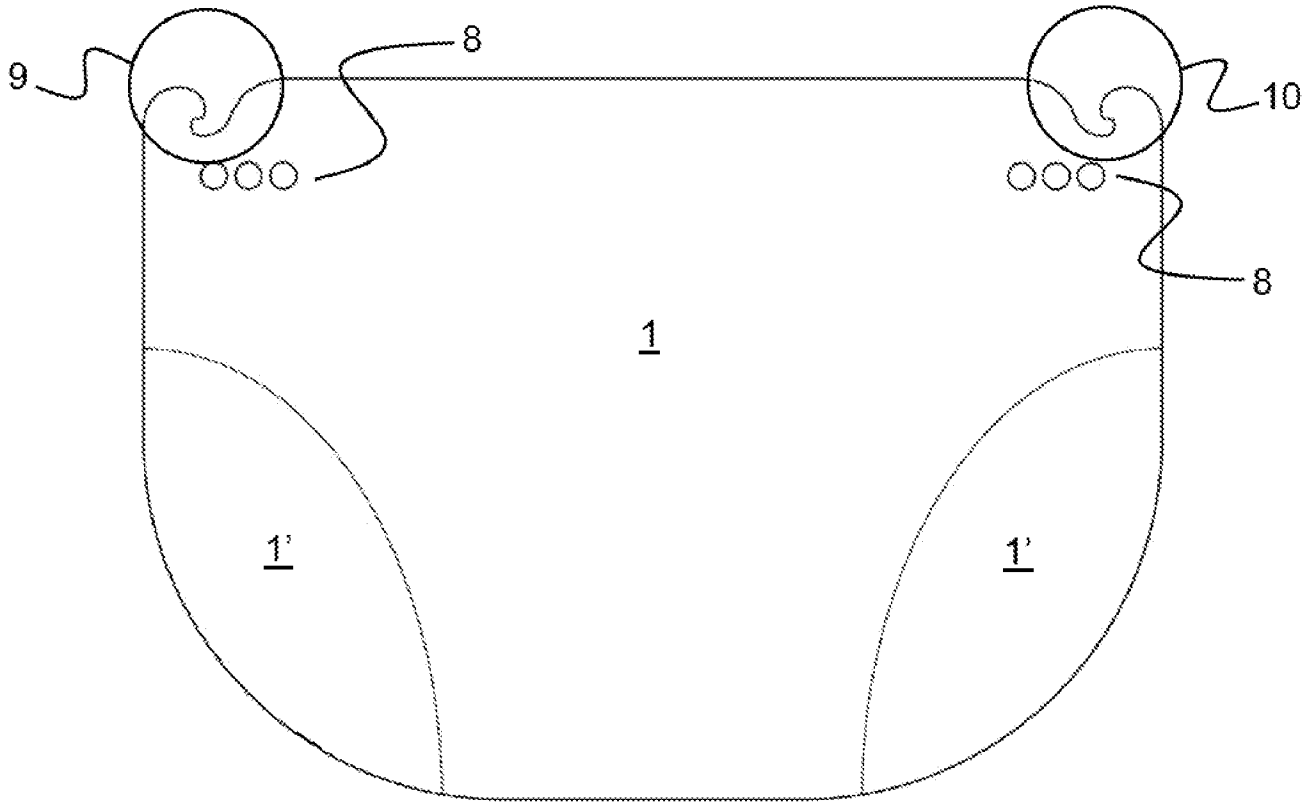

Fig. 2

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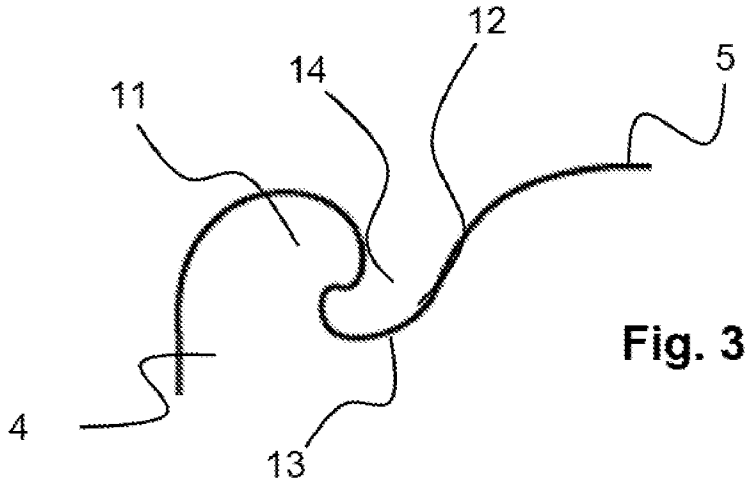

Fig. 3

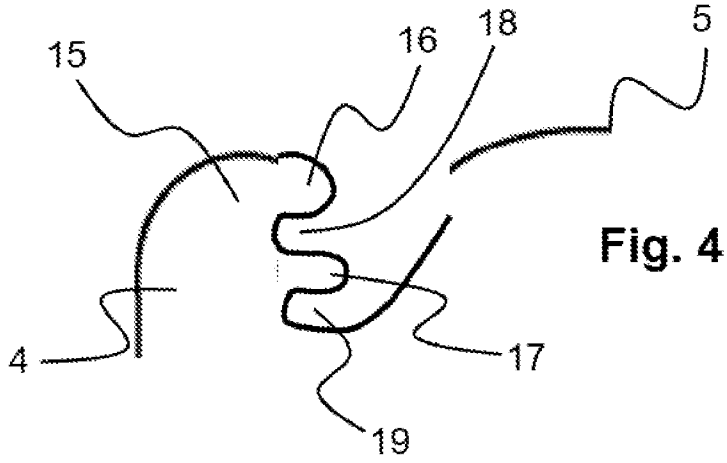

Fig. 4

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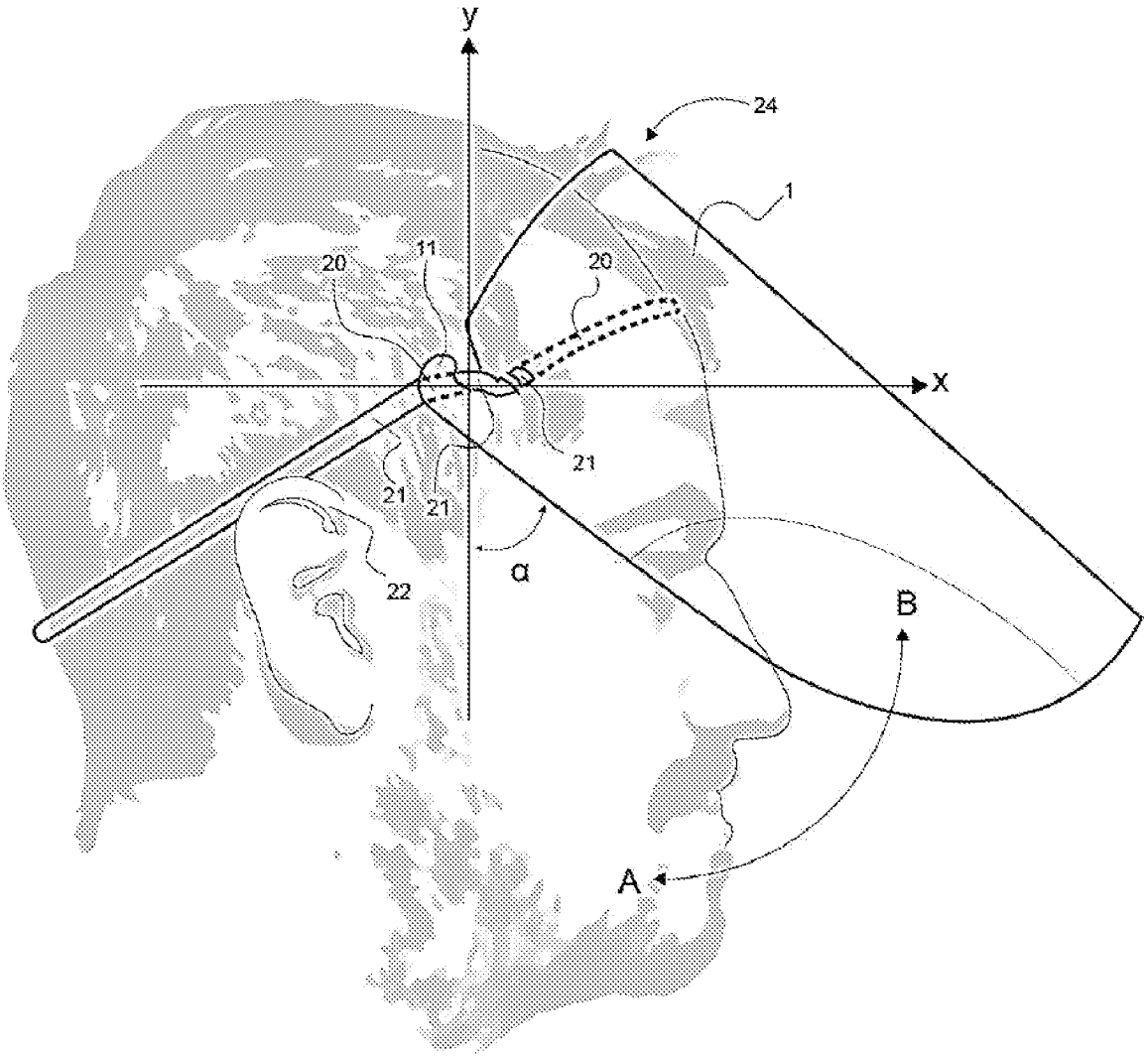

Fig. 5

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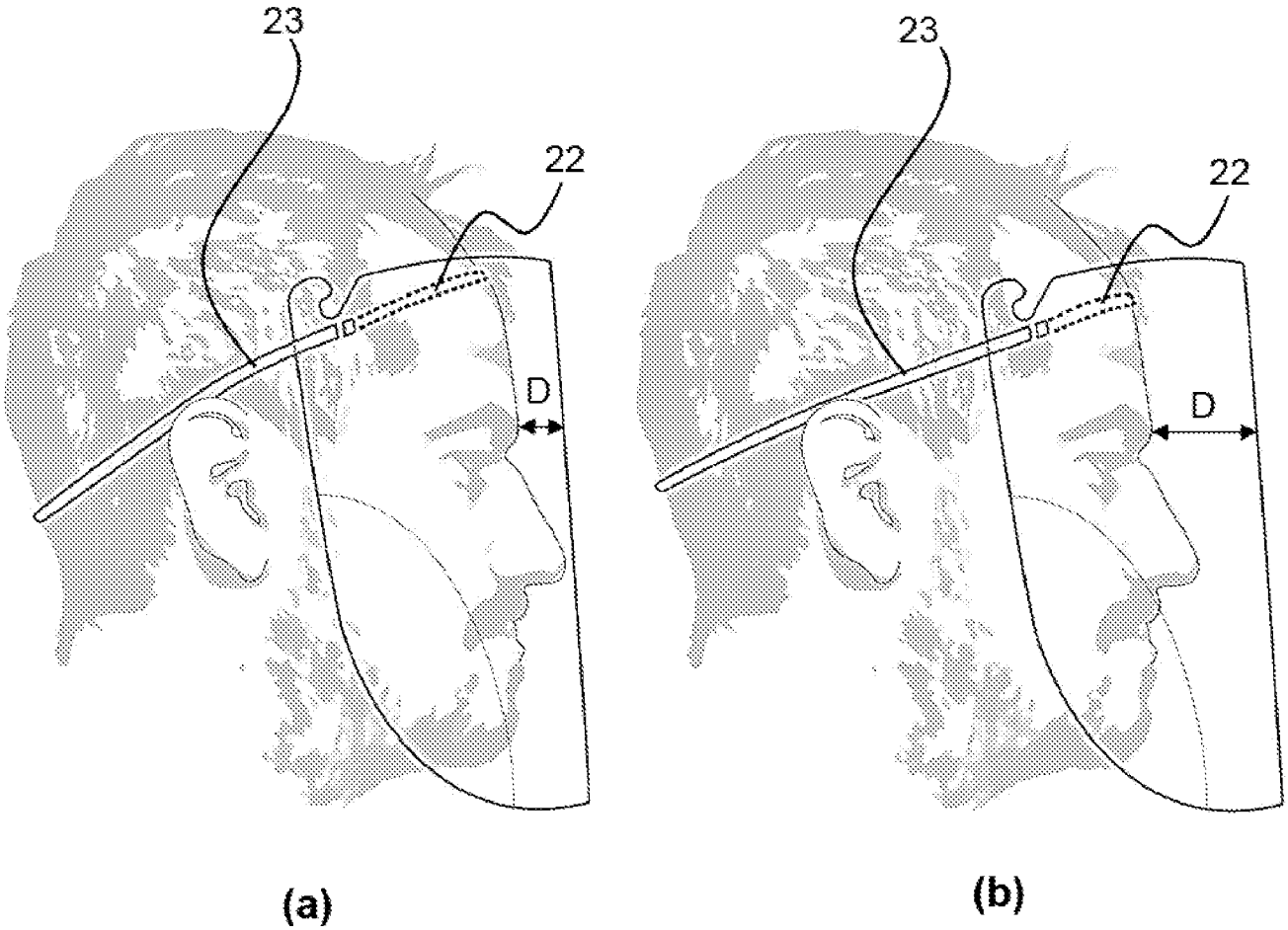

Fig. 6

DANISH PATENT AND TRADEMARK OFFICE

SEARCH REPORT - PATENT	Application No. PA 2020 00568

1. ☐ Certain claims were found unsearchable (See Box No. I).

2. ☐ Unity of invention is lacking prior to search (See Box No. II).

A. CLASSIFICATION OF SUBJECT MATTER

A41D 13/11 (2006.01); A62B 17/00 (2006.01)

According to International Patent Classification (IPC)

B. FIELDS SEARCHED

PCT-minimum documentation searched (classification system followed by classification symbols)

IPC & CPC: A41D, A42B, A62B

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

DK, NO, SE, FI: IPC-classes as above.

Electronic database consulted during the search (name of database and, where practicable, search terms used)

EPODOC, WPI, FULLTEXT (English), GOOGLE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant for claim No.
A	US 2012/0047614 A1 (CHOI) 2012.03.01 See in particular abstract and fig.	1-8
A	US 2016/0143378 A1 (HOWARD) 2016.05.26 See in particular abstract and fig.	1-8
T	JP 3227844U U (-) 2020.09.17 See in particular machine translation and fig.	1-8

☐ Further documents are listed in the continuation of Box C.

*	Special categories of cited documents:	"P"	Document published prior to the filing date but later than the priority date claimed.
"A"	Document defining the general state of the art which is not considered to be of particular relevance.	"T"	Document not in conflict with the application but cited to understand the principle or theory underlying the invention.
"D"	Document cited in the application.	"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.
"E"	Earlier application or patent but published on or after the filing date.	"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.
"L"	Document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified).	"&"	Document member of the same patent family.
"O"	Document referring to an oral disclosure, use, exhibition or other means.		

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Date of completion of the search report
29 September 2020

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SEARCH REPORT - PATENT		Application No. PA 2020 00568
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant for claim No.

SEARCH REPORT - PATENT	Application No. PA 2020 00568

Box No. I Observations where certain claims were found unsearchable

This search report has not been established in respect of certain claims for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched, namely:

2. ☐ Claims Nos.:
because they relate to parts of the patent application that do not comply with the prescribed requirements to such an extent that no meaningful search can be carried out, specifically:

3. ☐ Claims Nos.:
because of other matters.

Box No. II Observations where unity of invention is lacking prior to the search

The Danish Patent and Trademark Office found multiple inventions in this patent application, as follows:

SEARCH REPORT - PATENT	Application No. PA 2020 00568

SUPPLEMENTAL BOX

Continuation of Box [.]