Innovation, Sciences et Développement économique Canada
Office de la Propriété Intellectuelle du Canada

Innovation, Science and Economic Development Canada
Canadian Intellectual Property Office

CA 3090973 C 2021/01/12

(11)(21) 3 090 973

(12) BREVET CANADIEN
CANADIAN PATENT

(13) C

(22) Date de dépôt/Filing Date: 2020/08/24

(41) Mise à la disp. pub./Open to Public Insp.: 2020/10/24

(45) Date de délivrance/Issue Date: 2021/01/12

(51) Cl.Int./Int.Cl. *A61L 2/10* (2006.01)

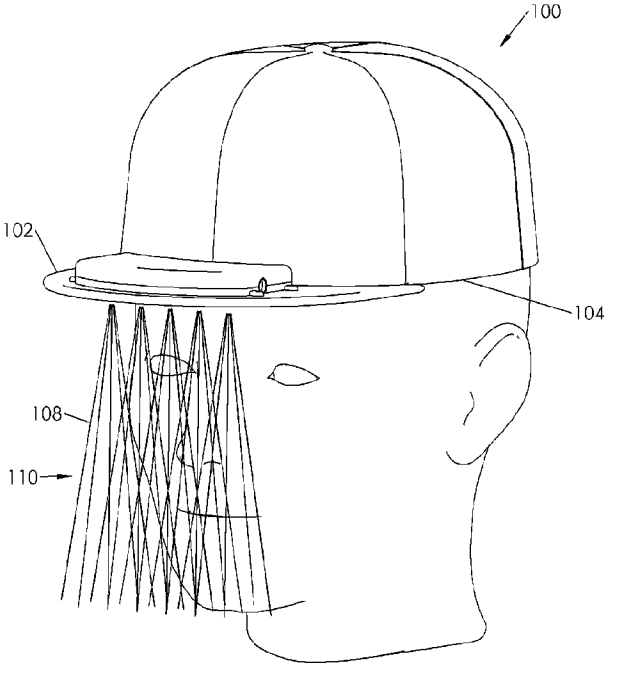
(72) Inventeurs/Inventors:
PERRY, TROY, CA;
SHAW, JEFF, CA

(73) Propriétaires/Owners:
PERRY, TROY, CA;
SHAW, JEFF, CA

(74) Agent: THOMPSON COOPER LLP

(54) Titre : PROCEDE ET APPAREIL POUR REDUIRE L'EXPOSITION DU VISAGE AUX GERMES EN SUSPENSION DANS L'AIR

(54) Title: METHOD AND APPARATUS FOR REDUCING FACIAL EXPOSURE TO AIRBORNE GERMS



(57) Abrégé/Abstract:
A method for reducing facial exposure to airborne germs involves affixing at least one UV-C light generator to a person, and focusing the at least one UV-C light generator to continuously bathe a face of the person with ultra-violet C light in a range of 100-280 nm. When the face is bathed in ultra-violet C light, airborne germs approaching eyes, nose and mouth of the person are to a large extent neutralized by UV-C light. Three embodiments for mounting the UV-C light generator in accordance with the teachings of the method are also disclosed.

ABSTRACT OF THE DISCLOSURE

A method for reducing facial exposure to airborne germs involves affixing at least one UV-C light generator to a person, and focusing the at least one UV-C light generator to continuously bathe a face of the person with ultra-violet C light in a range of 100-280 nm. When the face is bathed in ultra-violet C light, airborne germs approaching eyes, nose and mouth of the person are to a large extent neutralized by UV-C light. Three embodiments for mounting the UV-C light generator in accordance with the teachings of the method are also disclosed.

Date Reçue/Date Received 2020-08-24

TITLE

[0001] Method and apparatus for reducing facial exposure to airborne germs

FIELD

[0002] The present invention relates to a method for reducing facial exposure to airborne germs and an apparatus that has been developed in accordance with the teachings of the method.

BACKGROUND

[0003] As the global population continues to grow and communities become increasingly urbanized, the global population continues to congregate to create denser living environments. With denser communities and increasing interactions between individuals comes the risk of increasing rates of human-transmissible infections and disease. In the past decade, outbreaks of virus and bacterial infections has caused the deaths of many. The SARS epidemic and the COVID-19 pandemic are examples among many. Whilst finding a treatment for these infections is important, finding ways to prevent infection is equally significant.

[0004] Currently, measures taken to prevent the spread of viral infections include frequent sanitation with chemical and physical agents, limiting physical interactions between individuals, erecting physical barriers to prevent spread of airborne particulates, and use of personal protective equipment. Personal Protective Equipment (PPE) includes masks, gloves, gowns, head gear with face shields and similar protective gear.

[0005] US Patent Number 6,843,964 (Yeh) titled: "Air Purifying Cap", discloses a cap that generates anions to purify the air around a user's face.

SUMMARY

[0006] According to one aspect, there is provided a method for reducing facial exposure to airborne germs. The method involves affixing at least one UV-C light generator to a person, and focusing the at least one UV-C light generator to bathe a face of the person with ultra-violet C light, thereby reducing facial exposure to airborne germs approaching eyes,

Date Reçue/Date Received 2020-08-24

nose and mouth of the person.

[0007] According to another aspect, there is provided an apparatus for reducing facial exposure to airborne germs. The apparatus includes a support and a mounting for mounting the support to a human body in a substantially horizontal orientation. At least one UV-C light generator is supported by the support. The at least one UV-C light generator is oriented to direct UV-C light in a substantially vertical orientation.

[0008] It is envisaged that more than one UV-C light generator will be used to create a light curtain. That will extend down the face from above, extend up the face from below or extend across the face from one of the sides. It is envisaged that the UV-C light generators will operate continuously, but there may be instances where intermittent operation would provide adequate protection.

[0009] In order to facilitate the desired positioning, it is envisaged that the support for the at least one UV-C light generator will be mounted to a head or shoulders of a person. The mounting could be some form of headgear that rests on the head of the person. It will be appreciated that there are numerous configurations of headgear that could be used, such as: a hat, a cap, a helmet, a face shield, a visor, to name just a few. The mounting could also be a form of collar that rests on the shoulders of the person, with the UV-C light generators projecting a light curtain vertically upward. It will also be appreciated that the UV-C light generators could project the light curtain across the face from left to right or from right to left. There will hereinafter be illustrated and described of each of these embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] These and other features will become more apparent from the following description in which reference is made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to be in any way limiting, wherein:

[0011] FIG. 1 is a perspective view of a first embodiment of apparatus for reducing facial exposure to airborne germs in accordance with the teachings of the method.

Date Reçue/Date Received 2020-08-24

[0012] FIG. 2 is an exploded perspective view of the first embodiment illustrated in FIG. 1.

[0013] FIG. 3 is a perspective view of a second embodiment of apparatus for reducing facial exposure to airborne germs in accordance with the teachings of the method.

[0014] FIG. 4 is a perspective view of a third embodiment of apparatus for reducing facial exposure to airborne germs in accordance with the teachings of the method.

DETAILED DESCRIPTION

[0015] A first embodiment of apparatus for reducing facial exposure to airborne germs generally identified by reference numeral 100, will now be described with reference to FIG. 1 and FIG. 2. A second embodiment of apparatus for reducing facial exposure to airborne germs generally identified by reference numeral 200, will hereinafter be described with reference to FIG. 3. A third embodiment of apparatus for reducing facial exposure to airborne germs generally identified by reference numeral 300, will hereinafter be described with reference to FIG. 3.

[0016] First embodiment 100, second embodiment 200 and third embodiment 300 are examples of apparatus that have been developed to implement the teachings of the method. In broad terms that method involves affixing one or more UV-C light generator to a person, and focusing the one or more UV-C light generator to continuously bathe a face of the person with ultra-violet C light in a range of 100-280 nm. When the face is bathed in UV-C light, airborne germs approaching eyes, nose and mouth of the person are to a large extent neutralized.

[0017] It is envisaged that first embodiment 100 will be worn by a sports fan when attending sporting events. It is envisaged that second embodiment 200 will be worn by an entertainer when performing at a music concert or by a person attending a music concert where the wearing of hats would not be welcome. There are various environments in which public figures wish to remain safe, but wearing personal protective equipment is not

Date Reçue/Date Received 2020-08-24

practical. This includes theatrical actors on stage and politicians at political rallies. It is envisaged that third embodiment 300 will provide an extra measure of protection for health professionals.

Structure and Relationship of Parts of First Embodiment 100:

[0018] Referring to FIG. 1, first embodiment 100 includes a support 102, a mounting 104 for mounting support 102 to a human body in a substantially horizontal orientation, and at least one UV-C light generator 106 supported by support 102. The at least one UV-C light generator 106 is oriented to continuously bathe a face of the person with ultra-violet C light 108. Ultra-violet C light 108 is in the range of 100-280 nm. Universities have been experimenting with Ultra-violet C light in the range of 200-280 nm. For this reason, 200-280 nm is the preferred range.

[0019] As illustrated in FIG. 1, in first embodiment 100, there are five UV-C light generators 106 creating a light curtain 110. However, it will be appreciated that there could be any number of UV-C light generators 106 used. The five UV-C light generators 106 are secured to the head of the person. Mounting 104 is a headgear and support 102 is a visor that projects substantially horizontally from the headgear. It will be appreciated that there are numerous configurations of headgear that could be used, such as: a hat, a cap, a helmet, etc. First embodiment 100 also includes a switch 112 that switches the five UV-C light generators 106 on and off.

[0020] As illustrated in FIG. 2, first embodiment 100 also includes a battery pack 114 that supplies power to the five UV-C light generators 106.

Operation of First Embodiment 100:

[0021] Referring to FIG. 1, a user starts by placing first embodiment 100 on their head, such that support 102 is oriented towards the front of the user's face. The user then turns on the five UV-C light generators 106 using switch 112. The user then makes positional adjustments as needed, such that the five UV-C light generators 106 are creating light curtain 110 directly in front of and slightly on to the user's face. The user may then proceed to go

Date Reçue/Date Received 2020-08-24

about their usual daily activities. Over time, light curtain 110 created by the five UV-C light generators 106 will neutralize many of the harmful germs that would otherwise come in contact with the user's face.

[0022] It is envisaged that first embodiment 100 will be worn by a sports fan when attending sporting events. The casual nature and design of first embodiment 100 (being headgear in a cap or hat form) enables a user to wear first embodiment 100 to many casual outings and events, as well as when a user is out and about in their usual daily activities.

Structure and Relationship of Parts of Second Embodiment 200:

[0023] Referring to FIG. 3, second embodiment 200 includes a support 202, a mounting 204 for mounting support 202 to a human body in a substantially horizontal orientation, and at least one UV-C light generator 206 supported by support 202. The at least one UV-C light generator 206 is oriented to continuously bathe a face of the person with ultra-violet C light 208. Ultra-violet C light 208 is in the range of 100-280 nm. Universities have been experimenting with Ultra-violet C light in the range of 200-280 nm. For this reason, 200-280 nm is the preferred range.

[0024] As illustrated in FIG. 3, in second embodiment 200, there are four UV-C light generators 206 creating a light curtain 210. However, it will be appreciated that there could be any number of UV-C light generators 206 used. Mounting 204 is a collar and support 202 is supported by the collar. It will be appreciated that, for women, mounting could be in the form of a necklace.

Operation of Second Embodiment 200:

[0025] Referring to FIG. 3, a user starts by placing second embodiment 200 around their neck, such that support 202 is oriented towards the front of the user's face. The user then turns on the four UV-C light generators 206 and makes positional adjustments as needed, such that the four UV-C light generators 206 are creating light curtain 210 directly in front of and slightly on to the user's face. The user may then proceed to go about their usual daily

Date Reçue/Date Received 2020-08-24

activities. Over time, light curtain 210, created by the four UV-C light generators 206, will neutralize many of the harmful germs that would otherwise come in contact with the user's face.

[0026] It is envisaged that second embodiment 200 will be worn by an entertainer when performing at a music concert or by a politician, where the audience has paid to view the personality. The nature and design of second embodiment 200 (being a device that is worn around the neck, such as a collar or necklace) enables a user to have unobstructed vision while still benefiting from the neutralizing effects of light curtain 210, with airborne germs approaching eyes, nose and mouth of the person being to a large extent neutralized by UV-C light. Second embodiment 200 would also be appropriate in and well-suited to situations where headgear is not appropriate or permitted (e.g., in some school settings or at more formal events).

Structure and Relationship of Parts of Third Embodiment 300:

[0027] Referring to FIG. 4, third embodiment 300 includes a support 302, a mounting 304 for mounting support 302 to a human body, and at least one UV-C light generator 306 supported by support 302. The at least one UV-C light generator 306 is oriented to continuously bathe a face of the person with ultra-violet C light 308. Ultra-violet C light 308 is in the range of 200-280 nm.

[0028] As illustrated in FIG. 4, in third embodiment 300, there are four UV-C light generators 306 creating a light curtain 310. However, it will be appreciated that there could be any number of UV-C light generators 306 used. Mounting 304 is a headgear and support 302 is a face shield that extends substantially vertically from the headgear.

Operation of Third Embodiment 300:

[0029] Referring to FIG. 4, a user starts by placing third embodiment 300 on their head, such that support 302 is oriented towards the front of the user's face. The user then turns on the four UV-C light generators 306 and makes positional adjustments as needed, such that

Date Reçue/Date Received 2020-08-24

the four UV-C light generators 306 are creating light curtain 310 directly in front of and slightly on to the user's face. The user may then proceed to go about their usual daily activities. Over time, light curtain 310 created by the five UV-C light generators 306 will neutralize many of the harmful germs that would otherwise come in contact with the user's face.

[0030] It is envisaged that third embodiment 300 will be worn by health professionals in settings where an extra measure of protection is desirable to supplement the use of a face shield.

[0031] In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

[0032] The scope of the claims should not be limited by the illustrated embodiments set forth as examples, but should be given the broadest interpretation consistent with a purposive construction of the claims in view of the description as a whole.

Date Reçue/Date Received 2020-08-24

What is Claimed is:

1. A method for reducing facial exposure to airborne germs, comprising:

affixing at least one UV-C light generator to a person, and focusing the at least one UV-C light generator to bathe a face of the person with ultra-violet C light.

2. The method of Claim 1, wherein there is more than one UV-C light generator creating a light curtain.

3. An apparatus for reducing facial exposure to airborne germs, comprising:

a support;

a mounting for mounting the support to a human body in a horizontal orientation; and

at least one UV-C light generator supported by the support, the at least one UV-C light generator being oriented to bathe a face of the person with ultra-violet C light.

4. The apparatus of Claim 3, wherein there is more than one UV-C light generator creating a light curtain.

5. The apparatus of Claim 3, wherein the at least one UV-C light generator is secured to a head of the person.

6. The apparatus of Claim 3, wherein the mounting is a headgear and the support is a visor that projects horizontally from the headgear.

7. The apparatus of Claim 3, wherein the mounting is a headgear and the support is a face shield that extends vertically from the headgear.

8. The apparatus of Claim 3, wherein the mounting is a collar and the support is supported by the collar.

Date Reçue/Date Received 2020-11-06

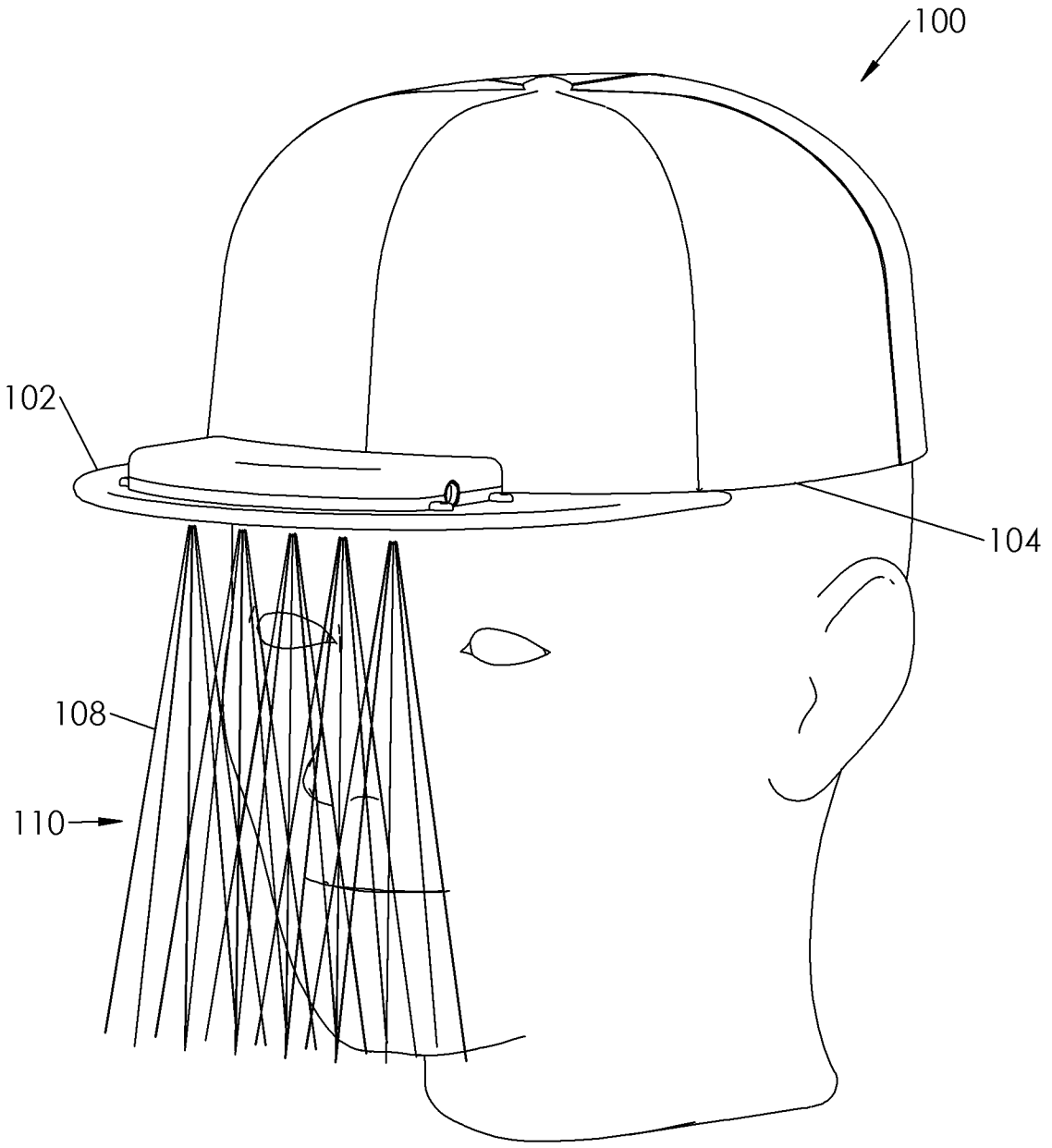


FIG. 1

Date Reçue/Date Received 2020-08-24

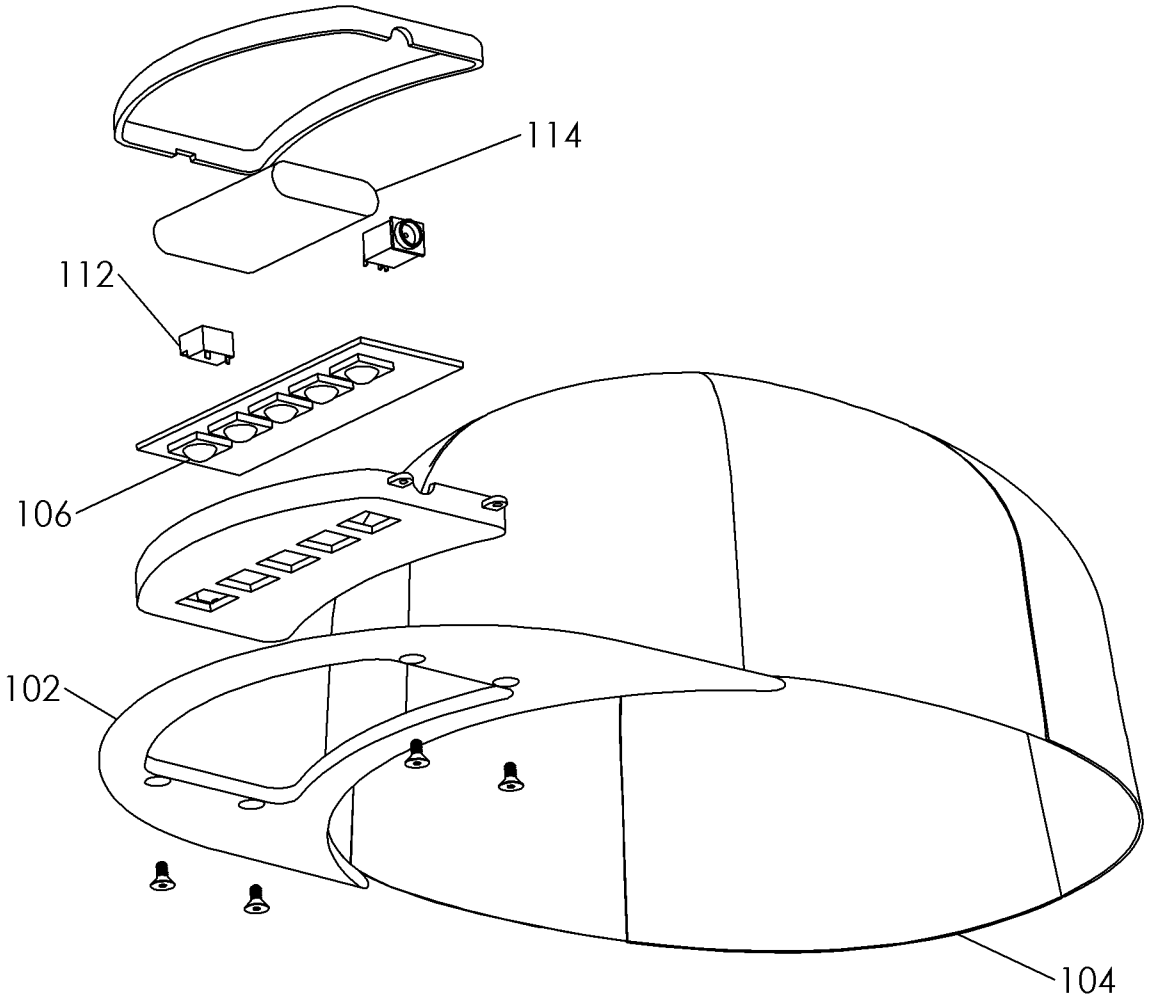


FIG. 2

Date Reçue/Date Received 2020-08-24

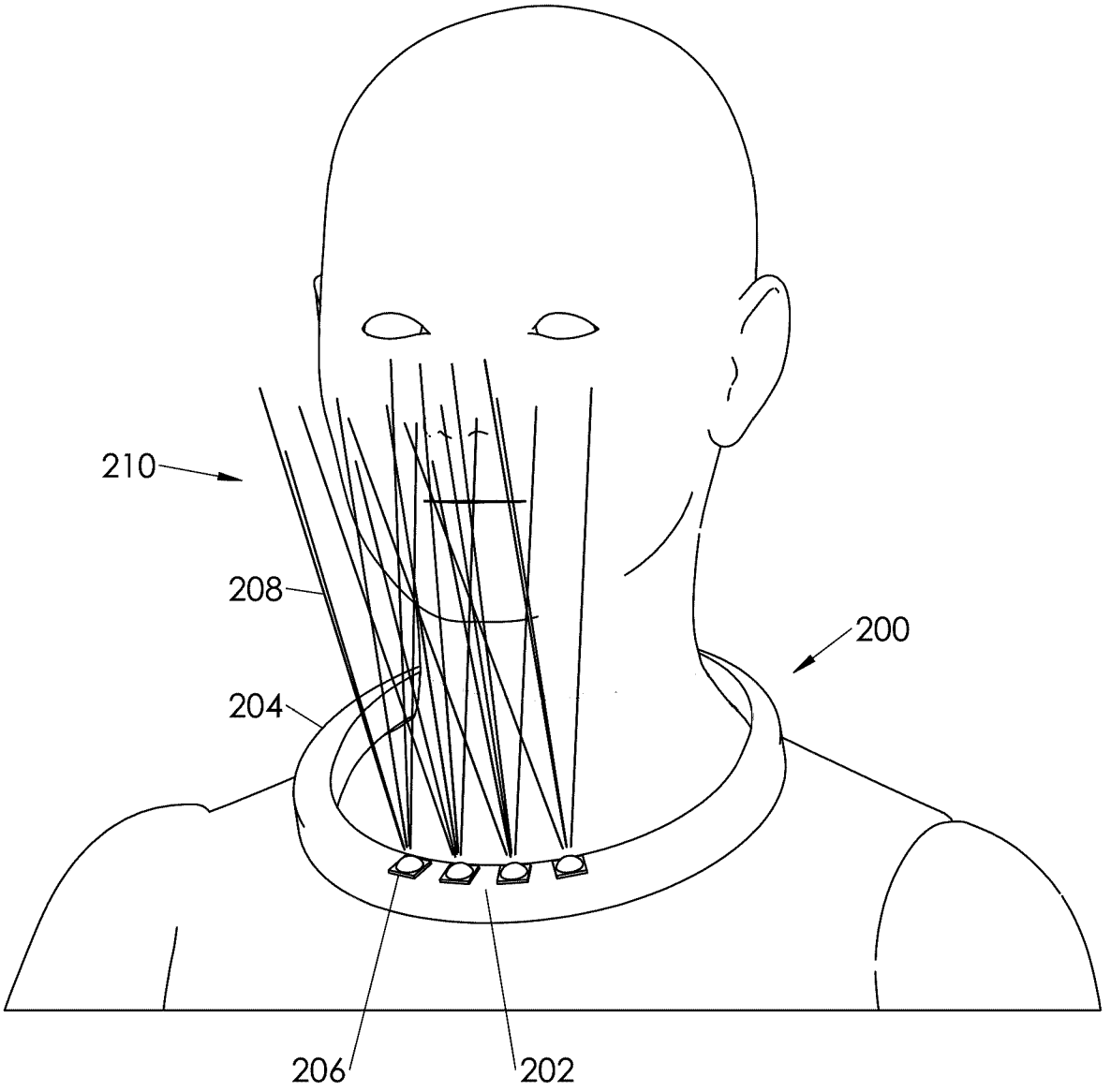


FIG. 3

Date Reçue/Date Received 2020-08-24

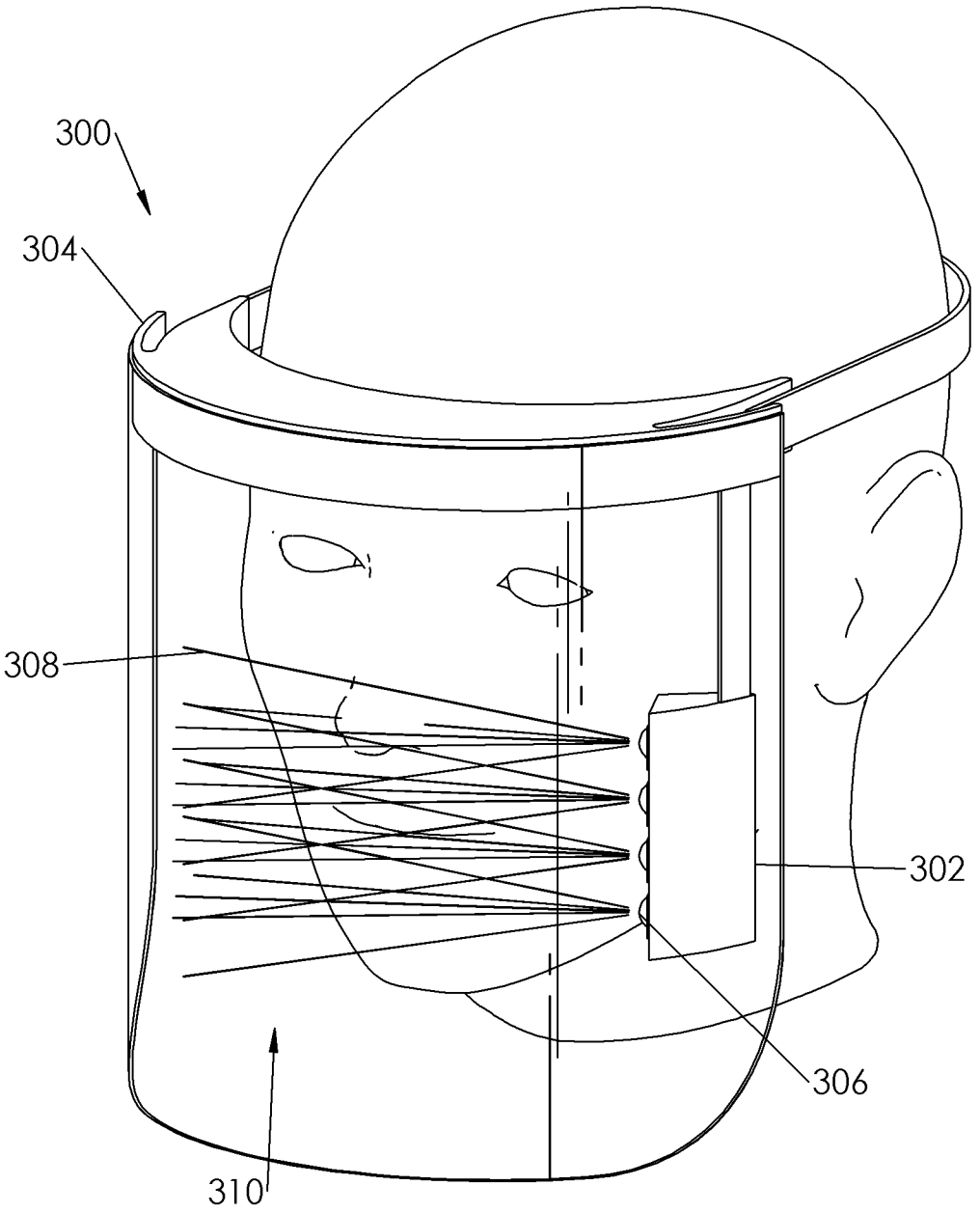
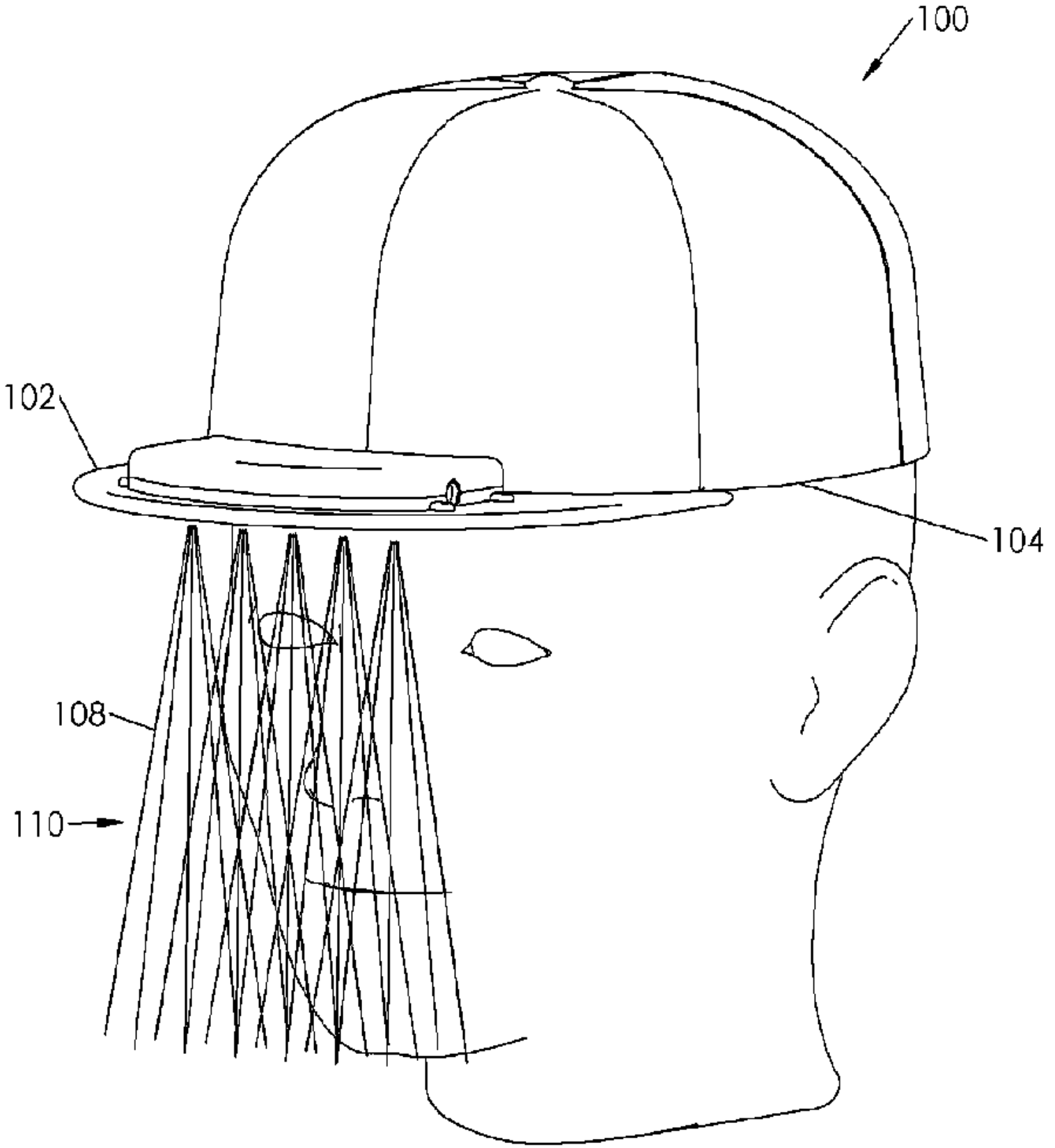


FIG. 4

Date Reçue/Date Received 2020-08-24


100
102
104
108
110