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(54) PROTECTIVE HELMET WITH EARPIECES

(57) The present invention discloses a case of protection for drivers of uncovered vehicles, comprising an external element in the shape of an ear and an internal cone joined to an ear pad, in each of the ends in which the ears of the user are located . The helmet of the invention can also comprise a filter and a piece of fabric to reduce turbulence and together with the external structure and the internal structure, recreate the acoustics of the human ear. This protective helmet increases the spatial perception of location and distance of the environment, reducing the risk of vehicular accidents.

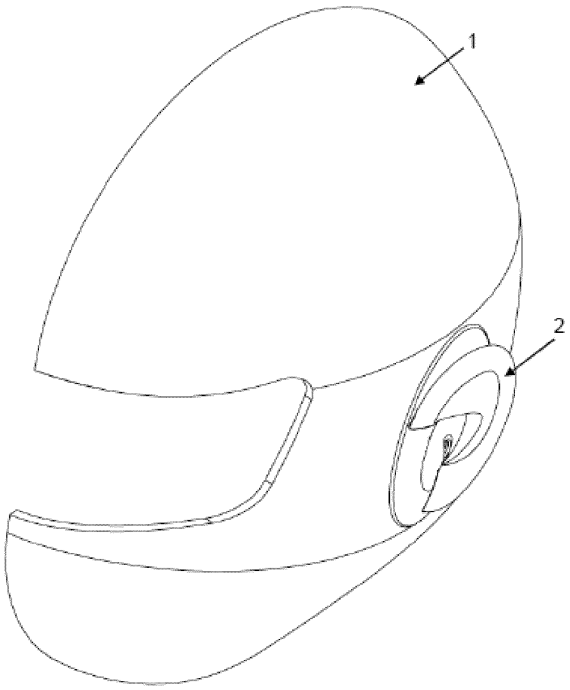

FIG. 1

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Description

FIELD OF INVENTION

[0001] The present invention is related to protective helmets for vehicle drivers, which improve the user's spatial perception.

BACKGROUND

[0002] US Patent US6347412 discloses an apparatus for diverting sound from a generally backward direction of a user to the user's ears. The apparatus includes a sound reflector that can be used by the user directly or can be connected to a separate support such as a helmet. The connection between the sound reflector and the helmet can be fixed or adjustable. When a helmet support is used, the apparatus may include a spacer located between two sound reflectors. The separator directs the sound to each of the two reflectors. The addition of dampening cushions helps sound reflectors divert air around the user's ears to reduce the sound of the wind and increase the user's ability to hear sounds originating from a backward direction.

[0003] Japan's Patent JP2010047886 refers to a helmet that includes holes to cancel its sealed state, a wind noise suppressor that covers the corresponding holes to prevent the formation of turbulent flow and auditory normalization means to prevent the generation of associated noise with the wind.

[0004] US Patent US3797040 discloses a protective helmet for use by a motorcyclist and comprises a pair of manually controlled ear lids or flaps, which are installed for coercion with hearing ports located in line with the ear of the user. When the tabs are completely open, they remain in this position until they are intentionally closed by the user. Each door or flaps comprises a rubber gasket to provide a hermetic seal while the motorcycle is in motion.

[0005] US Patent US3021526 mentions a helmet comprising ear covers, means mounted thereon for supporting ear cushions on each cover, wherein each of the means includes a series of substantially rigid telescopic rings arranged concentrically, of a rectangular cross section, and of progressively decreasing diameter. Each successor ring is dimensioned to allow substantial lateral movement relative to the next larger adjacent ring when said ring is fully telescopic within the larger ring. Additionally, the hull comprises diaphragms connecting the successive rings and being attached to the inner edge of a ring and to the outer edge of the next adjacent ring, and means for securing the ear cushion to the innermost ring.

[0006] China's Patent CN2172578, mentions a prismatic helmet with sense of hearing, which comprises convex edges, hearing orifices, and a hearing cover. The prismatic helmet has a high durability and ensures safe driving; It can be used by motorcyclists and by drivers of several uncovered motor vehicles.

SUMMARY OF THE INVENTION

[0007] The inventor has identified the need in the technical field for a helmet for drivers of uncovered vehicles that increases the driver's spatial perception of location and distance of the environment, reducing the risk of vehicular accidents.

[0008] The inventor provides a protective helmet comprising an internal structure and an external structure, which recreate the acoustic shape of human ears, avoiding the reduction of perception while driving a vehicle. These structures are arranged perpendicular to the auditory canal of each of the ears of the user, allowing the driver's awareness in audible frequencies of the environment. Additionally, the inventive protective helmet can utilize a noise filter and a fabric, which reduce turbulence, recreating the acoustics of human ears.

BRIEF SUMMARY OF DRAWINGS

[0009]

FIG. 1 shows a helmet cut assembled with the internal structure and external structure in a preferred embodiment of the helmet of the present invention.

FIG. 2 shows an explosion diagram of a preferred embodiment of the helmet of the present invention.

FIG. 3 shows a perspective view of one of the faces of the cone that is part of the internal structure of the helmet of the present invention.

FIG. 4 shows a perspective view of the other face of the cone that is part of the internal structure of the helmet of the present invention.

FIG. 5 shows a side view of the cone that is part of the internal structure of the helmet of the present invention.

FIG. 6 shows a perspective view of the external face of the ear element that is part of the external structure of the helmet of the present invention.

FIG. 7 shows a perspective view of the inner face of the ear element that is part of the external structure of the helmet of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The helmet of the present invention comprises a shell (1) and on each of its sides, where the ears of the user are usually located, an internal structure (3) and an external structure (2). These structures recreate the acoustic form of human ears. The helmet also comprises

a viewing hole in the shell (1).

[0011] The internal structure (3) is arranged inside the helmet, while the external structure (2) is disposed on the outside thereof and the two are coupled with the shell (1). Both internal and external structures (2 and 3) comprise hearing holes, which are aligned with a hearing hole of the shell (1), when said structures are coupled to the shell (1), allowing the entry of sound from the outside.

[0012] Particularly, the internal structure (3) may comprise an ear pad (4) and a cone (5).

[0013] The external structure (2) may comprise an ear-shaped element (8) and optionally a liner (9).

[0014] The cone (5) may comprise a coupling trumpet (10) to the ear pad (4). The ear pad (4), the trumpet coupling to the ear pad (10) and the cone (5) each comprise a hearing hole. The hearing holes are aligned when the internal structure (3) and the external structure (2) are assembled to the shell (1).

[0015] Particularly, the trumpet (10) is inserted in the hearing hole (13) of the ear pad (4), to couple said pad (4) to the cone (5).

[0016] In a preferred embodiment of the invention, the cone (5) and the trumpet (10) are made of a ductile material, which makes it possible to deform the trumpet (10) to insert it into the hearing hole (13) of the ear pad (4). Preferably, the ductile material may be silicone.

[0017] The ear-shaped element (8) comprises a hearing hole, which is aligned with the hearing ports of the ear pad (4), of the coupling trumpet (10) to the ear pad (4), of the cone (5) and the shell (1), when joining with the latter.

[0018] The ear-shaped element (8) can comprise holding structures (11) on its internal face. The cone (5) may comprise connecting holes (15) for receiving the fastening structures (11). Likewise, the shell (1) can comprise coupling holes (12) through which the fastening structures (11) of the ear-shaped element (8) pass, thus coupling both the cone (5) and the element in shape of ear (8) to the shell (1).

[0019] In a preferred embodiment of the invention, a filter (6) can be disposed within the hearing hole (16) of the cone (5).

[0020] Additionally, a piece of fabric (7) can be inserted into the hearing hole (14) of the shell (1) and into the hearing hole (17) of the ear-shaped element (8), said piece of fabric being also adhered to the hearing hole (16) of the cone (5). Optionally, the piece of fabric adheres to the cone (5), on top of the filter (6).

[0021] The external structure (2) may comprise a lining (9) on the ear-shaped element (8), to protect it from rain and foreign elements. The liner (9) can be fastened to the wall of the internal part of the ear-shaped element (8), for example by means of an adhesive.

[0022] All of the hearing holes (13, 14, 16, and 17) are aligned, and are arranged perpendicularly to the user's ear canal.

[0023] The sound signal enters through the external structure (2) and transduces acoustically to the cone (5). Subsequently, the trumpet (10) transmits the sounds to the user's ear, generating also a closure of the signal. Therefore, the ear accommodates the perception by psychoacoustics and perceives the relative location and distance of the sound sources. Thanks to the size of the cone that is attached to the ear of the user, it is possible to increase the perception of the audible and directional frequencies, which generate the perception of location and distance more easily for the user.

[0024] In a preferred embodiment of the invention, the ear pad (4) can be made of imitation leather, the filter (6) can be of windproof foam, the piece of fabric (7) can be stuffed, the shell (1) can be made of polycarbonate, the ear-shaped element (8) can be made of silicone and the lining (9) can be made of a fabric that is resistant to heat and UV rays. However, this list is not limiting and similar materials may be employed.

Claims

1. A helmet comprising a shell (1) with a vision space, **characterized in that** it comprises, at each of the two ends where the ears of the user are disposed, a hearing hole (14) in the shell, an element in the form of an ear (8) coupled to the outside of the shell (1) and a cone (5) joined by a trumpet (10) to an ear pad (4), the cone being attached to the inside of the shell (1), wherein the ear-shaped element (8), the cone (5), the trumpet (10) and the ear pad (4), each comprises a hearing hole (17, 16, 13), the hearing holes being aligned between them and with the hearing hole (14) in the shell (1) and arranged perpendicular to the space in which the user's ear canal is located.

2. The helmet of claim 1, wherein the ear-shaped element (8) comprises fastening structures (11), which pass through coupling holes (12) in the shell (1) and which are joined to the connecting holes (15) of the cone (5).

3. The helmet of claim 1, wherein the trumpet (10) is inserted into the hearing hole (13) of the ear pad (4).

4. The helmet of claim 1, wherein the cone (5) comprises a filter (6) within its hearing hole (16).

5. The helmet of claim 1, further comprising a piece of fabric (7) passing through the hearing hole (14) of the shell (1) and the hearing hole (17) of the ear-shaped element (8).

6. The helmet of claim 1, wherein the ear-shaped element (8) is covered by a liner (9).

7. The helmet of claim 1, wherein the cone (5) and the trumpet (10) are made of silicone.

8. The helmet of claim 5, wherein the piece of fabric (7) is plush.

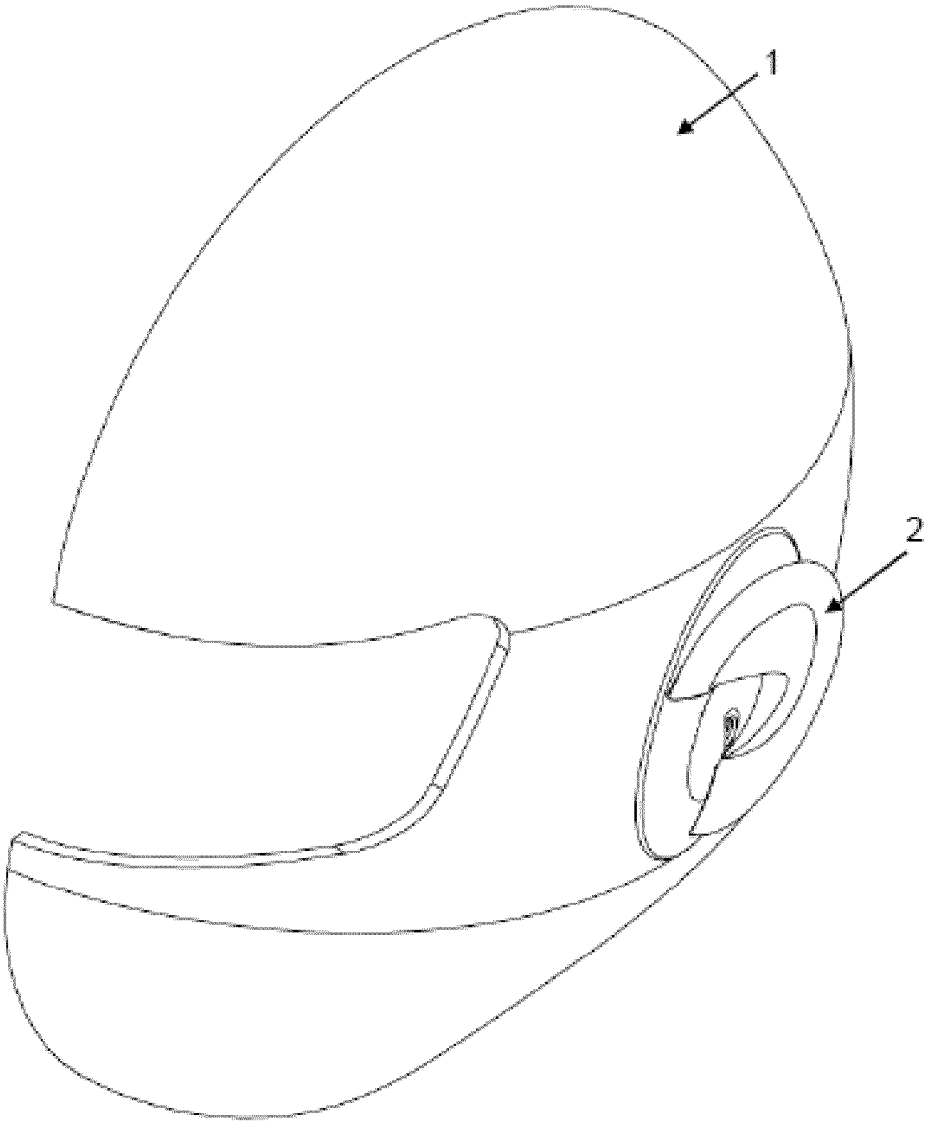

FIG. 1

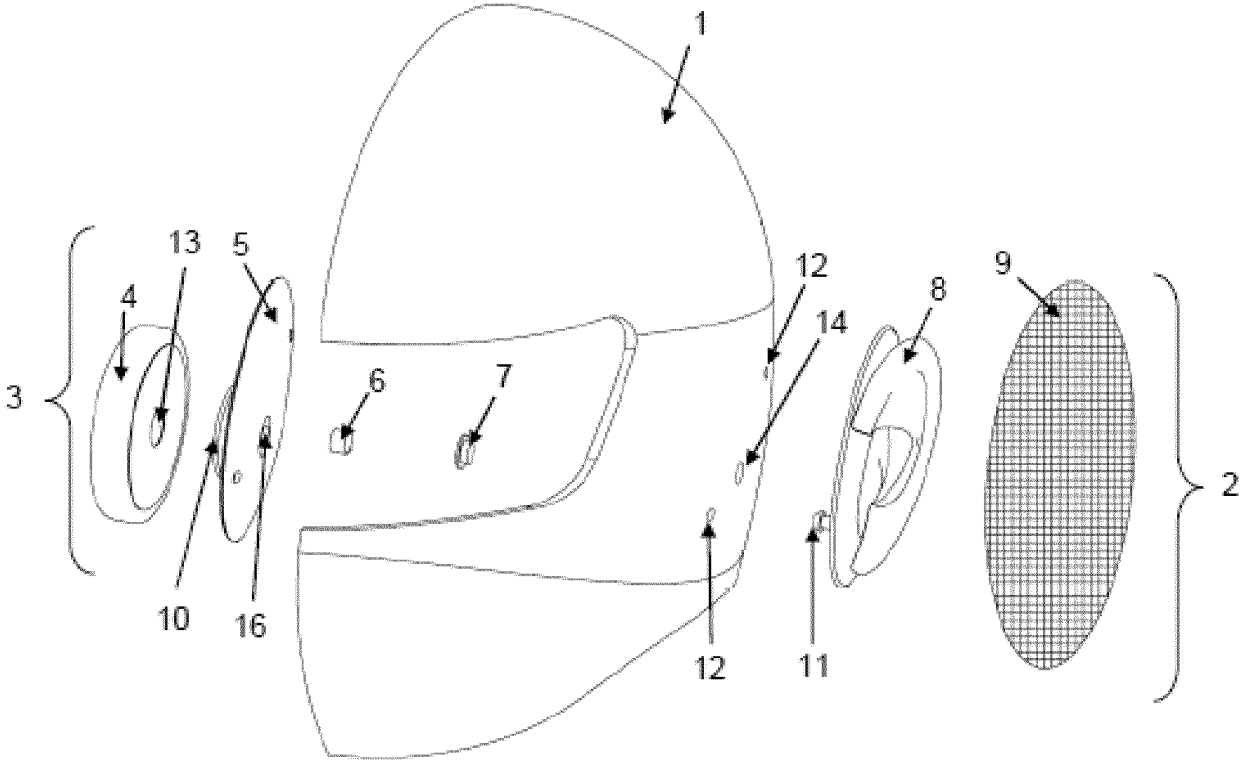

FIG. 2

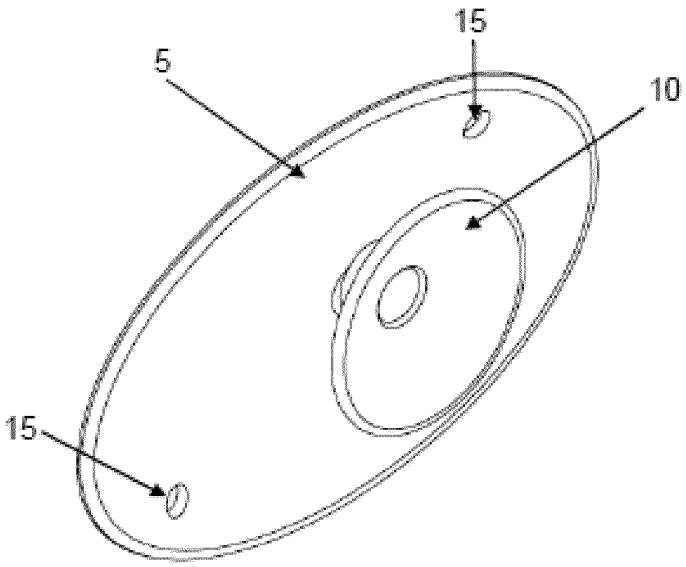

FIG. 3

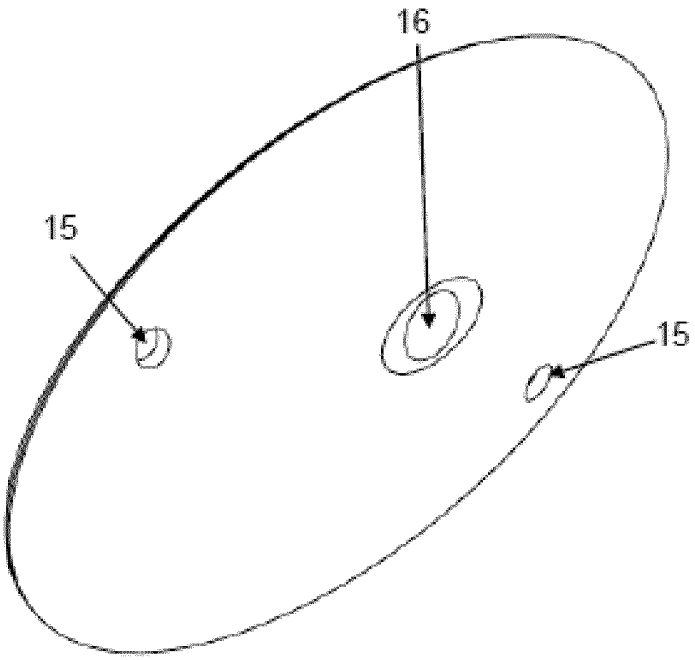

FIG. 4

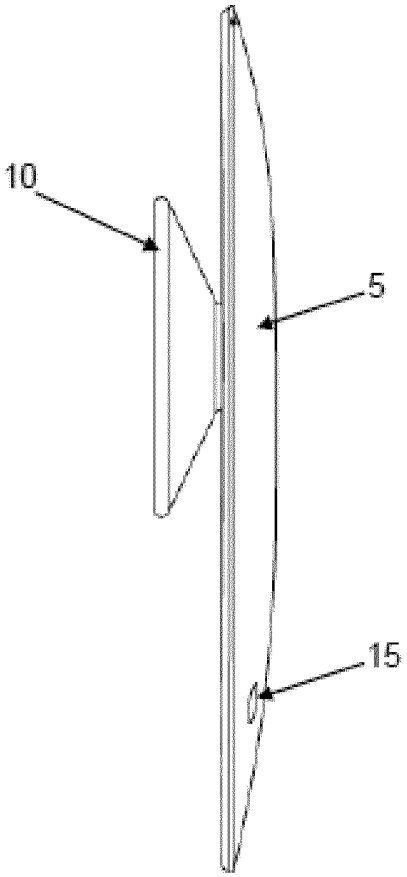

FIG. 5

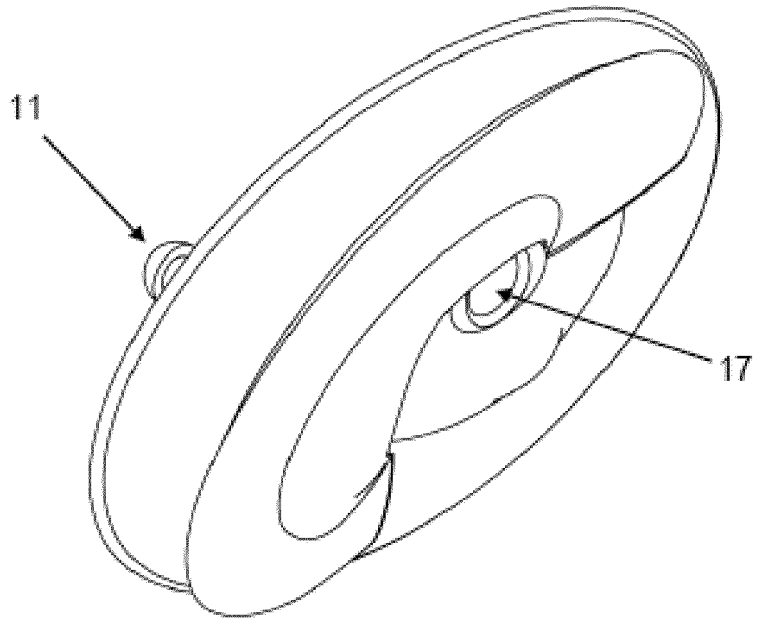

FIG. 6

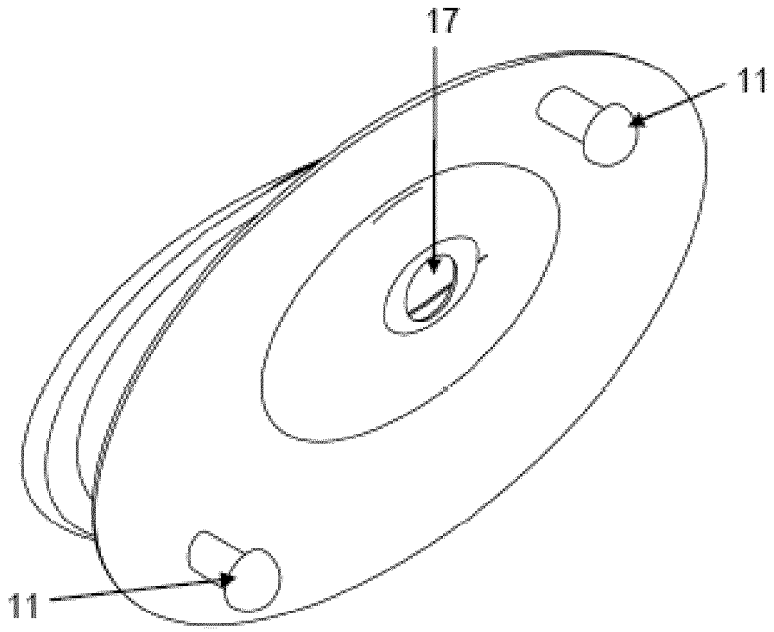

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2018/054161

A. CLASSIFICATION OF SUBJECT MATTER
INV. A42B3/16
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A42B A61F

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 632 048 A (MORTELL DAVID [US] ET AL) 27 May 1997 (1997-05-27) column 2, line 57 - column 4, line 31; figures 1,2 -----	1-8
A	US 5 696 356 A (DUDLEY JAMES P [US] ET AL) 9 December 1997 (1997-12-09) column 3, line 10 - column 5, line 5; figure 1 -----	1-8

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

☒ See patent family annex.

* Special categories of cited documents :

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"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	Date of mailing of the international search report
22 August 2018	03/09/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	D'Souza, Jennifer

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2018/054161

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5632048 A	27-05-1997	US 5632048 A	27-05-1997
		WO 9710732 A1	27-03-1997
US 5696356 A	09-12-1997	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6347412 B **[0002]**
- JP 2010047886 B **[0003]**
- US 3797040 A **[0004]**
- US 3021526 A **[0005]**
- CN 2172578 **[0006]**