

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 20201161	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/ES2020/070744	International filing date (day/month/year) 27.11.2020	Priority date (day/month/year) 28.11.2019	
International Patent Classification (IPC) or national classification and IPC INV. F24F3/16			
Applicant BIOWAIR TOTAL SYSTEMS, S.L.			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (sent to the applicant and to the International Bureau) a total of <u>10</u> sheets, as follows: ☐ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☒ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☐ Box No. VII Certain defects in the international application ☐ Box No. VIII Certain observations on the international application			
Date of submission of the demand 27.09.2021		Date of completion of this report 11.02.2022	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465		Authorized officer Blanc, Sébastien Telephone No. +49 89 2399-4017	



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/ES2020/070744

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-23 as originally filed

Claims, Numbers

1-10 filed in electronic form on 27-09-2021

Drawings, Sheets

1/7-7/7 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☒ the claims, Nos. 1-10
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/ES2020/070744

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 31.01.2022 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-10</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-10</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-10</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

1 **Re Item I**

Basis of the report

The amendment filed on 10.12.2021 in claim 1 with the International Bureau under Article 19(1) introduces subject-matter which extends beyond the content of the application as filed, contrary to Article 19(2) PCT. The amendment concerned is the following:

- " a device that applies an electrical charge to the multifilament diffuser."

In the original application, see page 19, line 32 of the description, this feature is disclosed together with the features:

- "made of stainless steel placed at the air outlet, so that it acts as a resistive unit at 300°C".

The features "multifilament diffuser" and "temperature at 300°C" are inextricably linked because the function, the structure (multifilament) and the temperature are technically linked since the function of sterilizing is achieved with the temperature.

The isolation of the feature (Intermediate Generalization) results in a subject-matter that was not originally disclosed. For example, the original application does not disclose a device that applies an electrical charge to the multifilament diffuser so that it acts as a resistive unit at 100°C.

The feature "made of stainless steel placed at the air outlet" is not considered as inextricably linked to the feature "multifilament diffuser", because the function of sterilizing could also be achieved with another material, and at a different location.

Claim 1 filed on 10.12.2021 can therefor not be taken into account for this report. Instead, the set of claims filed on 27.09.2021 will be the basis for this report.

2 Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

D2 (CN105571009A) is regarded as being the prior art closest to the subject-matter of claim 1, and discloses (see in particular Fig. 1 and 3 and claim 1):

a respiratory treatment device for therapeutic use, the device comprises a motorized air recirculation system, a set of filters for air purification (1, 2, 3, 4), an ultraviolet ray sterilizer (8) and a plasma electrostimulator (6),

wherein the device comprises:

- means for the ejection of air in laminar flow (12);
- means for redirecting laminar flow (blades);
- a stabilizer (housing 10);
- ~~a multifilament diffuser,~~
- one or more UV-C LEDs (8),

wherein the motorized air recirculation system comprises a motor that works between 550-1200 rpm, the motor driving a system of tubular blades and a tubular steel integral recirculation system (best to be seen on Fig. 1), and

- ~~a device that applies an electrical charge to the multifilament diffuser (7) configured to function as a resistive thermal sterilizing unit providing heat at 300°C.~~

The subject-matter of claim 1 therefore differs from this known respiratory treatment device in that it comprises a multifilament diffuser and in that the multifilament diffuser is configured to function as a resistive thermal sterilizing unit providing heat at 300°C,

and is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may therefore be regarded as to improve the sterilisation function.

The solution proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) because the combination of a multifilament diffuser and thermal sterilisation at a temperature of 300°C is not a standard measure in such respiratory treatment devices. It is also not motivated by common sense and not suggested in the cited documents.

As argued by the applicant in the letter dated of 10.12.2021, it does not seem fair to see in the negative ion generating device (reference 7) of D2 a multifilament diffuser, since ion generating devices are based on discharge electrodes and not on filaments.

- 3 Dependent claims 2-10 are due to their dependency with claim 1 also new and inventive.



EUROPEAN PATENT OFFICE
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GERMANY

Our ref.: 20201161

Madrid, September 27, 2021

International Patent Application: PCT/ES2020/070744
Applicant: BIOWAIR TOTAL SYSTEMS, S.L.

Dear Sirs,

This communication is in reply to the International Search Report and the Written Search Opinion dated 26 March 2021, and it includes amended claims (according to Article 34 PCT), and it is to be included accompanying the demand for International Preliminary Examination.

We enclose:

- An amended set of claims intended to replace the original set of claims.
- The amended set of claims with highlighted amendments (over the original set of claims).

The following amendments have been made (as the application is published in Spanish, references in brackets are referred to the English translation of said application that was sent to the EPO as International Searching Authority):

Claim 1 now specifies a **respiratory** treatment device (100). Basis for this amendment can be found in page 17, line 13 of the application.

The wording "wherein a first flow (A) comprising a first flow rate of 70-85% of all the air inside the breathing treatment device (100) and comprising PM "particulate matter" particles larger than 1 µm is circulated through the multifilament diffuser (2) and the means for ejecting air in laminar flow (6) and it is ejected to the outside of the breathing treatment device (100) in laminar flow" has been deleted **to clarify claim 1**.

The wording "wherein a second flow (B) comprising a second flow of 15-30% of all the air inside the breathing treatment device (100) and comprising PM particles smaller than 1 µm is recirculated inside the breathing treatment equipment system (100) and exposed to one or more UV-C LEDs (11), has been deleted **to clarify claim 1**.

The wording "with noise emission between 0 and 5 dB" has been deleted **to clarify claim 1**.

The wording "towards the head of the patient" has been deleted **to clarify claim 1**.

Claim 1 has been amended to specify that the motor drives a system of tubular blades and a tubular steel integral recirculation system **to clarify claim 1**. Basis for this amendment can be obtained from page 5, 3rd paragraph.

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Furthermore, claim 1 has been amended to specify a device that applies an electrical charge to the multifilament diffuser (2) configured to function as a resistive thermal sterilizing unit providing heat at 300°C. Basis for this amendment can be found in page 19, last paragraph.

Claim 2 has been deleted.

The wording “toward the patient’s face” has been deleted from claim 3 **to clarify this claim.**

Claim 5 now specifies wireless transmission means **to clarify this claim.**

Novelty and inventive step of amended claims (Art. 33(1)(2)(3) PCT)

Claim 1 states a respiratory treatment device (100) that comprises a device that applies an electrical charge to the multifilament diffuser (2) configured to function as a resistive thermal sterilizing unit providing heat at 300°C.

D1 does not disclose a respiratory treatment device that comprises a device configured to function as a resistive thermal sterilizing unit. Hence, claim 1 is new in view of D1.

D2 to D6 do not disclose a respiratory treatment device that comprises a device configured to function as a resistive thermal sterilizing unit. Hence, claim 1 is new in view of D2 to D6. Consequently, the subject-matter of amended claim 1 is therefore new (Article 33(1)(2) PCT) over the disclosure of D1 to D6.

The applicant submits that the technical effect achieved by a device that applies an electrical charge to the multifilament diffuser (2) configured to function as a resistive thermal sterilizing unit providing heat at 300°C is that the breath of heated air causes the musculature of the bronchi of the patient to be reduced, and therefore, the risk of the closing of the bronchi is also reduced. **This fact permits patients with respiratory diseases as e.g. Asma to breath better.**

Hence, the combination of a **purified and sterilized air** which is also **heated** with the claimed device functioning as a resistive thermal sterilizing unit and ejected in a **laminar flow** provided by the proposed respiratory treatment device for therapeutic use according to claim 1 is not disclosed or suggested by any of the cited prior art.

Consequently, the subject-matter of amended claim 1 therefore involves an inventive step as required by Article 33(1)(3) PCT.

The rest of the claims are dependent claims of claim 1 and as such, they also meet the requirements of novelty and inventive step (Article 33(1)(2)(3) PCT).

We expect that the application is now in condition for acceptance. We respectfully request the IPEA to issue a positive International Preliminary Examination Report (IPER). Nevertheless, should the IPEA not agree with the applicant, we respectfully request the IPEA to provide **a Written Opinion before emitting any negative IPER.**

Yours faithfully,



H & A

Association of Professional representatives n° 709
Encl.



CLAIMS

1. Respiratory treatment device (100) for therapeutic use, the device comprises a motorized air recirculation system, a set of filters for air purification (10a, 10b, 10c, 10d), an ultraviolet ray sterilizer and a plasma electrostimulator, the device **characterized in that** it comprises:

- means for the ejection of air in laminar flow (6);
 - means for redirecting laminar flow;
 - a stabilizer (1);
 - a multifilament diffuser (2),
 - one or more UV-C LEDs (11),
- wherein the motorized air recirculation system comprises a motor that works between 550-1200 rpm, the motor driving a system of tubular blades and a tubular steel integral recirculation system, and
- a device that applies an electrical charge to the multifilament diffuser (2) configured to function as a resistive thermal sterilizing unit providing heat at 300°C.

2. Respiratory treatment device (100) according to the preceding claims, wherein the means for redirecting the laminar flow comprise an aluminum deflector (5).

3. Respiratory treatment device (100) according to the preceding claims, which also comprises a support system (14), preferably with wheels.

4. Respiratory treatment device (100) according to the preceding claims, which also comprises means of wireless transmission means, preferably WI-FI and/or Bluetooth.

5. Respiratory treatment device (100) according to the preceding claims, further comprising an LED display (16).

6. Respiratory treatment device (100) according to the preceding claims, wherein the set of filters for air purification comprises a pre-filter (10a), a blue antibacterial filter (10b), a HEPA 13 filter (High Efficiency Particulate Air) (10c), a catalytic platinum activated carbon filter (10d).

7. Respiratory treatment device (100) according to the preceding claims, further comprising a stainless steel filter (10e).

5 8. Respiratory treatment device (100) according to the preceding claims, wherein the stabilizer (1) comprises silicon and/or steel.

9. Respiratory treatment device (100) according to the preceding claims, which also includes an audible alarm.

10 10. Respiratory treatment device (100) according to the preceding claims, which also comprises a multilevel nanoparticle laser meter.



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GERMANY

Our ref.: 20201161

Madrid, December 10th, 2021

International Patent Application: PCT/ES2020/070744

Applicant: BIOWAIR TOTAL SYSTEMS, S.L.

Response to the Written Opinion of the International Preliminary Examining Authority

Dear Sirs:

In response to the Written Opinion of the International Preliminary Examining Authority, I enclose a set of amended claims in clean and marked-up version to assist the International Preliminary Examining Authority. I request that this claim set replaces the set currently on file.

Claim Amendments

Claim 1 has been amended to specify a device that applies an electrical charge to the multifilament diffuser (2). Basis for this amendment can be derived from page 19 line 32 of the description.

Patentability

The applicant wishes to submit the following arguments in favour of the inventive activity of the present PCT application:

The claimed device that applies an electrical charge to the multifilament diffuser (2) can heat the air e.g. up to 300 degrees (see page 19 line 32 of the description) before ejecting the air

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through the means for the ejection of air in laminar flow (6) of the respiratory treatment device (100). The applicant submits that the air is ejected at a suitable temperature for humans, e.g. at room temperature (i.e. 25 degrees) (e.g. see page 3, line 23 of the description: *To prevent insomnia, the thermal sensation must be kept between 18 and 24 °C*).

Heating the air by means of the claimed device achieves the following inevitable effects in the air:

- Reducing the air density and air humidity;
- Sterilized the air by eliminating germs and pathogens;
- Make the anions biodisponibles, respirables para una persona que en un espacio próximo.
-
- Increasing the amount of reactive oxygen species (ROS or ROS for reactive oxygen) as e.g. oxygen ions, free radicals, and both inorganic and organic peroxides.

Hence, it is submitted that the claimed device not only sterilizes the air, but also obtains a more breathable air for patients with respiratory diseases as the density and humidity of the air is considerably reduced, achieving a bronchodilator effect in patients, and increases the amount of reactive amount of reactive oxygen species.

In this regard, it is submitted that the “device 7” of D2 CN105571009 specified as “negative ion generating device 7, sterilization and sterilization” is a conventional ion generator used in purifiers. The applicant cannot relate the claimed **device that applies an electrical charge to the multifilament diffuser (2)** as claimed, that achieves the aforementioned technical effects with this conventional “device 7” specified in D2 that only emits a permanent flow of negative ions into the environment. The device specified in D2 sterilizes the air that passes through it, in contrast to the present application, that makes negatively charged ions to float through the air and become bioavailable and breathable.



Hence, the subject matter of claim 1 is new but also possesses inventive activity.

Yours sincerely

H&A

Association of professional representatives N°709



CLAIMS

1. Respiratory treatment device (100) for therapeutic use, the device comprises a motorized air recirculation system, a set of filters for air purification (10a, 10b, 10c, 10d), an ultraviolet ray sterilizer and a plasma electrostimulator, the device **characterized in that** it comprises:

- means for the ejection of air in laminar flow (6);
- means for redirecting laminar flow;
- a stabilizer (1);
- a multifilament diffuser (2),
- one or more UV-C LEDs (11),
 wherein the motorized air recirculation system comprises a motor that works between 550-1200 rpm, the motor driving a system of tubular blades and a tubular steel integral recirculation system, and
- a device that applies an electrical charge to the multifilament diffuser (2).

2. Respiratory treatment device (100) according to the preceding claims, wherein the means for redirecting the laminar flow comprise an aluminum deflector (5).

3. Respiratory treatment device (100) according to the preceding claims, which also comprises a support system (14), preferably with wheels.

4. Respiratory treatment device (100) according to the preceding claims, which also comprises means of wireless transmission means, preferably WI-FI and/or Bluetooth.

5. Respiratory treatment device (100) according to the preceding claims, further comprising an LED display (16).

6. Respiratory treatment device (100) according to the preceding claims, wherein the set of filters for air purification comprises a pre-filter (10a), a blue antibacterial filter (10b), a HEPA 13 filter (High Efficiency Particulate Air) (10c), a catalytic platinum activated carbon filter (10d).

7. Respiratory treatment device (100) according to the preceding claims, further comprising a stainless steel filter (10e).

5 8. Respiratory treatment device (100) according to the preceding claims, wherein the stabilizer (1) comprises silicon and/or steel.

9. Respiratory treatment device (100) according to the preceding claims, which also includes an audible alarm.

10 10. Respiratory treatment device (100) according to the preceding claims, which also comprises a multilevel nanoparticle laser meter.