



(11) **EP 4 437 905 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.10.2024 Bulletin 2024/40

(51) International Patent Classification (IPC):
A46B 9/04 (2006.01)

(21) Application number: **24166447.3**

(52) Cooperative Patent Classification (CPC):
A46B 9/04; A46B 2200/1066

(22) Date of filing: **26.03.2024**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(71) Applicant: **Pianetti, Francesco**
20013 Magenta (IT)

(72) Inventor: **Pianetti, Francesco**
20013 Magenta (IT)

(74) Representative: **Pizzoli, Antonio Mario et al**
Notarbartolo & Gervasi S.p.A.
Viale Achille Papa, 30
20149 Milano (IT)

(30) Priority: **27.03.2023 IT 202300005769**

(54) **TOOTHBRUSH AND METHOD FOR ITS USE**

(57) Toothbrush comprising a head (1), a handle (3) and a neck (4) which is arranged between the head (1) and the handle (3), wherein an upper surface of the head (1) is provided with one or more tufts (2) of bristles, wherein in the head (1), the handle (3) and the neck (4) are arranged along a longitudinal axis (A), wherein the minimum width (W4) of the neck (4) is shorter than the maximum width (W1) of the head (1) and shorter than the maximum width (W3) of the handle (3), wherein two recesses (5) are arranged adjacent to the head (1) on the two sides of the neck (4), wherein the maximum length (L4) of the neck (4) is shorter than the maximum length (L3) of the handle (3), wherein the maximum widths (W5) of the recesses (5) with respect to the head (1) are 6-9 mm, in particular 7.5-8.5 mm, and the maximum length (L1) of the head (1) is 80-130%, in particular 90-110%, of the maximum width (W1) of the head (1).

The present description also relates to a non-therapeutic method of using this toothbrush.

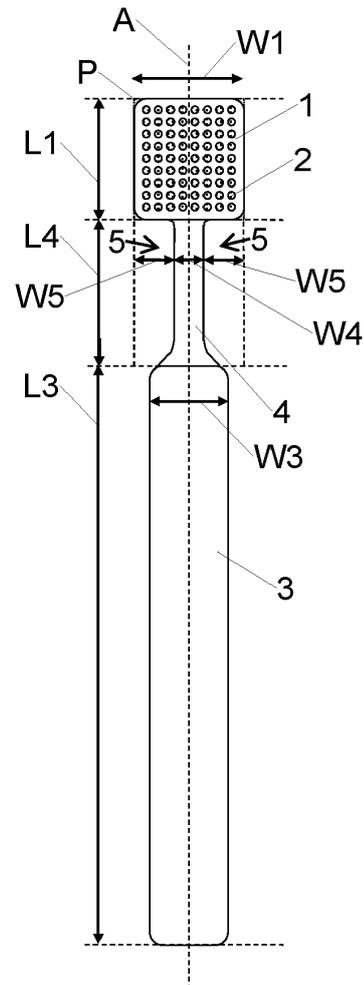


Fig. 1

EP 4 437 905 A1

Description

Technical field

[0001] The present description relates to a toothbrush, in particular a toothbrush which can be used for the correct cleaning of a person's teeth and gums. The present description also relates to a non-therapeutic method for using this toothbrush.

Background of the description

[0002] Known toothbrushes comprise a head, a handle, and a neck. Documents KR 10-2183121 B1 and WO 2022/138024 A1 describe toothbrushes according to the preamble of claim 1.

[0003] Correct cleaning of the teeth requires that the inner and outer surfaces of the teeth, i.e. the substantially vertical ones, are brushed in the direction from the gums to the teeth with an alternating movement that is substantially vertical, with the bristles arranged in a substantially horizontal manner and substantially perpendicular to the surfaces inner and outer teeth of both dental arches. Such movement is difficult to obtain with known toothbrushes, so the user often uses incorrect movements to clean the teeth.

[0004] Document WO 97/01297 A1 describes a toothbrush having a single recess adjacent to the head and to one of the two sides of the neck, as well as a head with a relatively elongated shape. The maximum width of the recess compared to the head is greater than 9 mm. This toothbrush allows only partial correct cleaning of the teeth, and even less of the adjacent gums, due to the shape, proportions and dimensions of the neck, head and recess.

[0005] Document EP 3097821 A1 describes a toothbrush having two recesses on the two sides of the neck between the head and the handle, which recesses are however arranged in staggered positions along the longitudinal axis of the neck. The maximum width of the recess adjacent to the head is greater than 9 mm. The second recess is not very effective, since it is not adjacent to the head, so that the head can reach all the inner surfaces of both dental arches, so even this toothbrush only allows a partial correct cleaning of the adjacent teeth and gums, again due to the shape, proportions and dimensions of the neck, head and socket.

[0006] Therefore, said known toothbrushes allow for correct cleaning of the outer surface of the teeth but present problems for correctly cleaning all the inner surfaces of the teeth of both dental arches, due to the shape, proportions and dimensions of these toothbrushes.

[0007] Document JP 6734493 B1 describes a toothbrush without a handle, with a very large head provided with bristles on both surfaces and with a long and elastic neck, so that it can be chewed by the user to clean the teeth but cannot be held with one hand and used like traditional toothbrushes.

Description summary

[0008] Object of the present description is therefore to provide a toothbrush which is free from said problems. Said object is achieved with a toothbrush and a method for its use, the main features of which are specified in the attached claims, to be considered an integral part of the present description.

[0009] Thanks to particular arrangements, proportions and dimensions of the recesses which are obtained beside the neck and are adjacent to the head, the toothbrush according to the present description favors the correct cleaning not only of the outer surfaces but also of the inner surfaces of the teeth of both dental arches, especially if the method according to this description is used, so as to also avoid the penetration of the bristles up to the dental edge where microscopic connective, arterial-venous vascular and terminal nervous structures reside and which must not be damaged so as not to encourage tooth decay short- and medium-term, especially on molar teeth which statistically are the first to suffer decay.

[0010] In particular, the head and neck are substantially symmetrical with respect to one or two planes which preferably pass through the longitudinal axis of the toothbrush, so that cleaning is effective and correct on the inner surfaces of both dental arches when the toothbrush is held not only with the right hand but also with the left hand.

[0011] Preferably, the head has particular dimensions and is relatively wider than known heads, so as to be able to correctly clean both the teeth and the adjacent gums with a single rotary movement around the longitudinal axis of the toothbrush.

[0012] Furthermore, thanks to further particular shapes, arrangements, proportions and/or dimensions of the head, bristles, neck and/or handle, the toothbrush allows you to clean the teeth not only correctly but also easily and quickly.

Brief description of the drawings

[0013] Further advantages and features of the toothbrush and of the method according to the present description will be evident to those skilled in the art from the following detailed description of some of their embodiments, to be considered non-limiting examples of the claims, with reference to the attached drawings in which:

- figure 1 is a top view of one embodiment of the toothbrush;
- figure 2 is a side view of the toothbrush of figure 1;
- figure 3 is an enlarged top view of a portion of the head of the toothbrush of figure 1;
- figure 4 is a schematic top view of the toothbrush of figure 1 during use.

Exemplary embodiments

[0014] Figures 1 and 2 show a first embodiment of the toothbrush, which comprises a head 1 with an upper surface provided with one or more tufts 2 of bristles, a handle 3 of elongated shape and a neck 4 which is arranged between the head 1 and the handle 3. In the present embodiment the tufts 2 are arranged only on an upper surface of the head 1. The head 1, the handle 3 and the neck 4 are preferably made in a single substantially rigid piece, in particular made of plastic, so that during use the toothbrush can flex within an angle no greater than 10°. The head 1, the handle 3 and the neck 4 are arranged along a preferably straight longitudinal axis A. In other embodiments the longitudinal axis A can also be curved, polygonal or mixed. A metal bar substantially parallel to the longitudinal axis A is preferably arranged inside the neck 4 and protrudes into the head 1 and the handle 3.

[0015] The minimum width W4 of the neck 4 is shorter than the maximum width W1 of the head 1 and shorter than the maximum width W3 of the handle 3, so as to form two recesses 5 on the two sides of the neck 4 which are adjacent to the head 1.

[0016] Preferably, the head 1 (tufts 2 excluded) and the neck 4 are substantially symmetrical with respect to a vertical plane, i.e. to a plane substantially parallel to the tufts 2, or to two planes perpendicular to each other, for example a horizontal plane and a vertical plane, in particular one or two planes passing through the longitudinal axis A.

[0017] Preferably, the minimum height H4 of the neck 4 is substantially equal to the maximum height H1 of the head 1 and/or to the maximum height H3 of the handle 3 and/or the height H2 of the bristles of the tufts 2 is 12-14 mm, so that also the third molars of a dental arch can be reached.

[0018] Preferably, the head 1 has a substantially parallelepiped shape with rounded corners and/or the volume of the head 1 is at least 95% of the volume of the smaller parallelepiped P, shown with dashed lines, which entirely contains the head 1 and/or the maximum length L1 of head 1 is 80-130%, in particular 90-110% to obtain optimal performance, of the maximum width W1 of head 1.

[0019] The maximum width W1 of the head 1 is 200-400%, in particular 250-350% to obtain optimal performance, of the maximum widths W5 of the recesses 5 with respect to the head 1, namely the maximum width of a recess 5 with respect to the maximum extension of the head 1 on the side of this recess 5, as better shown in figure 1. In particular, the sum of the maximum widths W5 of the recesses 5 substantially corresponds to the difference between the maximum width W1 of the head 1 and the minimum width W4 of the neck 4. The maximum widths W5 of the recesses 5 with respect to the head 1 are 7-9 mm, in particular 7.5-8.5 mm to obtain optimal performance. The adjacent sides of the head 1 and of a recess 5 are substantially perpendicular to each other.

[0020] Preferably, the maximum length L1 of the head 1 is 18-22 mm and/or the maximum width W1 of the head 1 is 18-22 mm and/or the maximum length L4 of the neck 4 and/or the recesses 5 is 15-30 mm. The maximum length L4 of the neck 4 is shorter than the maximum length L3 of the handle 3. Preferably, the total length L of the toothbrush is greater than 120 mm, in particular greater than 130 mm, more particularly greater than 150 mm.

[0021] Figure 3 shows that the minimum distance d at the base of the bristles between a first tuft 2 and the adjacent tufts is at least 30%, in particular at least 50% to obtain optimal performance, of the maximum dimension D, in particular of the diameter, of the surface of the head 1 occupied by the first tuft 2.

[0022] The dimensions and proportions mentioned above may vary whether the toothbrush is intended to be used by a child or an adult.

[0023] Preferably, the bristles of the tufts 2 have rounded tips and are soft, wherein the meaning of soft bristle is well recognized in the toothbrush industry.

[0024] Preferably, the longitudinal axes of the head 1, the handle 3 and the neck 4 are substantially aligned with the longitudinal axis A of the toothbrush, so that the head 1, the handle 3 and the neck 4 do not form angles with each other if seen from the side, as in figure 2.

[0025] Figure 4 shows that, in the method of using the toothbrush, in particular for a non-therapeutic use such as daily cosmetic cleaning of the teeth, the head 1 is placed by a user inside a dental arch 6 of a person, for example the lower dental arch of the mouth of the same user, wherein the neck 4 of the toothbrush is arranged astride the dental arch 6 and the head 1 of the toothbrush is substantially parallel to an inner surface of the teeth 7 which are adjacent to the head 1, namely with the bristles of the tufts 2 substantially perpendicular to this inner surface, after which the user rotates the handle 3 around the longitudinal axis A of the toothbrush, namely in the direction shown by the arrow, to brush with the bristles of the tufts 2 of the head 1 the inner surface of the teeth 7 and a surface of a portion of the gums 8 which is adjacent to these teeth 7, with an alternating rotary movement of the head 1 which is substantially tangential to the inner surface of the teeth 7. At the same time, the user can also translate the handle 3 from and towards the gums 8, so that the alternating movement of the head 1 becomes roto-translational. The same movement can also be performed for the other teeth, both inside and outside the dental arch 6.

[0026] Variants or additions can be made by those skilled in the art to the embodiments described and illustrated herein while remaining within the scope of the following claims. In particular, further embodiments may comprise the technical features of one of the following claims with the addition of one or more technical features described in the text or illustrated in the drawings, taken individually or in any reciprocal combination and including their equivalent features.

[0027] Furthermore, the terms "one/one", "two", etc. in the description and claims respectively mean "at least one", "at least two", etc., unless otherwise specified. Similarly, angles, proportions and values mentioned in the text and/or shown in the drawings comprise a 5% tolerance.

Claims

1. Toothbrush comprising a head (1), a handle (3) and a neck (4) which is arranged between the head (1) and the handle (3), wherein an upper surface of the head (1) is provided with one or more tufts (2) of bristles, wherein the head (1), the handle (3) and the neck (4) are arranged along a longitudinal axis (A), wherein the minimum width (W4) of the neck (4) is smaller than the maximum width (W1) of the head (1) and smaller than the maximum width (W3) of the handle (3), wherein two recesses (5) are arranged adjacent to the head (1) on both sides of the neck (4), wherein the maximum length (L4) of the neck (4) is smaller than the maximum length (L3) of the handle (3), **characterized in that** the maximum widths (W5) of the recesses (5) with respect to the head (1) are 6-9 mm, in particular 7.5-8.5 mm, and the maximum length (L1) of the head (1) is 80-130%, in particular 90-110%, of the maximum width (W1) of the head (1).
2. Toothbrush according to the preceding claim, wherein the sum of the maximum widths (W5) of the recesses (5) substantially corresponds to the difference between the maximum width (W1) of the head (1) and the minimum width (W4) of the neck (4).
3. Toothbrush according to one of the preceding claims, wherein the head (1) and the neck (4) are substantially symmetrical with respect to:
 - a vertical plane, and/or,
 - two planes perpendicular to each other, and/or
 - one or two planes passing through the longitudinal axis (A).
4. Toothbrush according to one of the preceding claims, wherein the head (1) has a substantially parallelepiped shape.
5. Toothbrush according to one of the preceding claims, wherein the volume of the head (1) is at least 95% of the volume of the smallest parallelepiped (P) which entirely contains the head (1).
6. Toothbrush according to one of the preceding claims, wherein a metal bar substantially parallel to the longitudinal axis (A) is arranged inside the neck (4) and protrudes into the head (1) and the handle (3).
7. Toothbrush according to one of the preceding claims, wherein the maximum width (W1) of the head (1) is 200-400%, in particular 250-350%, of the maximum widths (W5) of the recesses (5) with respect to the head (1).
8. Toothbrush according to one of the preceding claims, wherein the maximum length (L1) of the head (1) is 18-22 mm and/or the maximum width (W1) of the head (1) is 18-22 mm and/or the maximum length (L4) of the neck (4) and/or the recesses (5) is 15-30 mm.
9. Toothbrush according to one of the preceding claims, wherein the minimum distance (d) at the base of the bristles between a first tuft (2) and the adjacent tufts (2) is at least 30%, in particular at least 50%, of the maximum size (D) of the surface of the head (1) occupied by the first tuft (2).
10. Toothbrush according to one of the preceding claims, wherein the total length (L) of the toothbrush is greater than 120 mm, in particular greater than 130 mm, more particularly greater than 150 mm.
11. Toothbrush according to one of the preceding claims, wherein the height (H2) of the bristles of the tufts (2) is 12-14 mm.
12. Toothbrush according to one of the preceding claims, wherein the minimum height (H4) of the neck (4) is substantially equal to the maximum height (H1) of the head (1) and/or the maximum height (H3) of the handle (3).
13. Toothbrush according to one of the preceding claims, wherein the head (1), the handle (3) and the neck (4) are made in a single substantially rigid piece.
14. Toothbrush according to one of the preceding claims, wherein the adjacent sides of the head (1) and of a recess (5) are substantially perpendicular to each other.
15. Method for non-therapeutic use of a toothbrush according to one of the preceding claims, wherein the head (1) is arranged by a user within a dental arch (6) of a person, wherein the neck (4) of the toothbrush is arranged astride the dental arch (6) and the head (1) of the toothbrush is substantially parallel to an inner surface of the teeth (7) of the dental arch (6) which are adjacent to the head (1), after which the user rotates the handle (3) around the longitudinal axis (A) of the toothbrush to brush with the bristles of the tufts (2) of the head (1) the inner surface of the teeth (7) and a surface of a portion of the gums (8) which is adjacent to these teeth (7), with an alternating rotational movement of the head (1) which

is substantially tangential to the inner surface of the teeth (7).

5

10

15

20

25

30

35

40

45

50

55

5

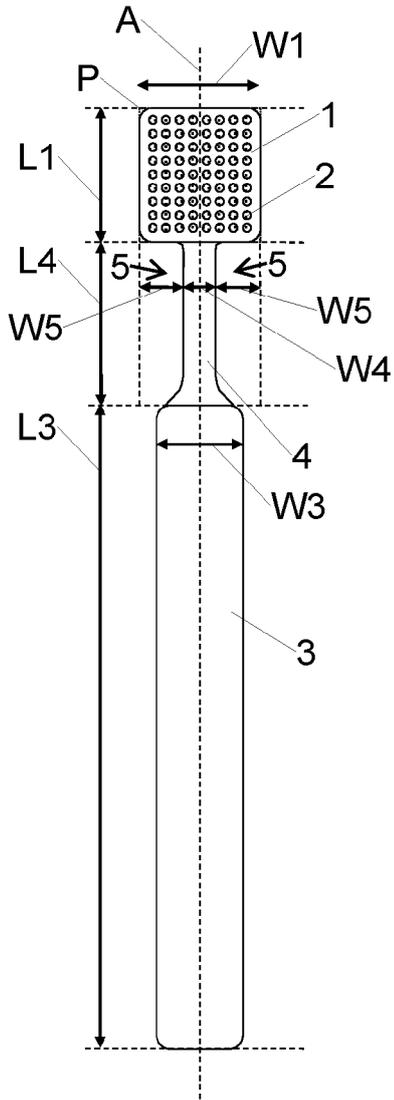


Fig. 1

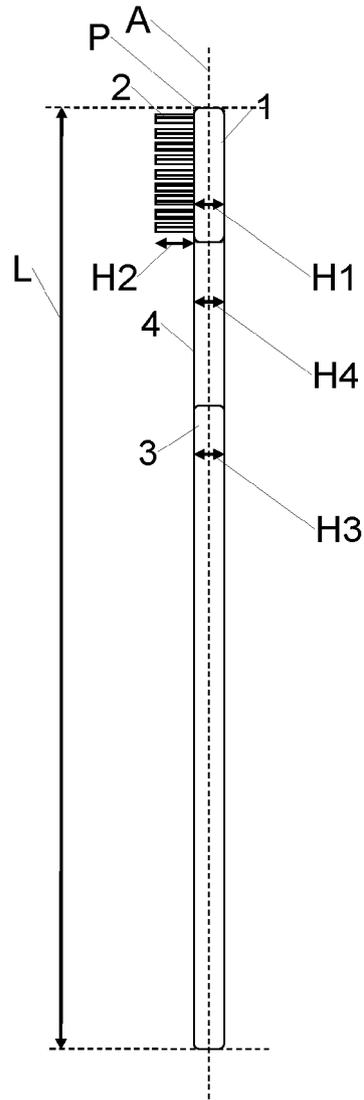


Fig. 2

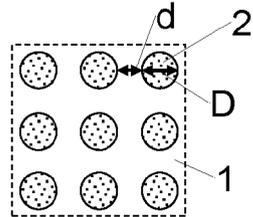


Fig. 3

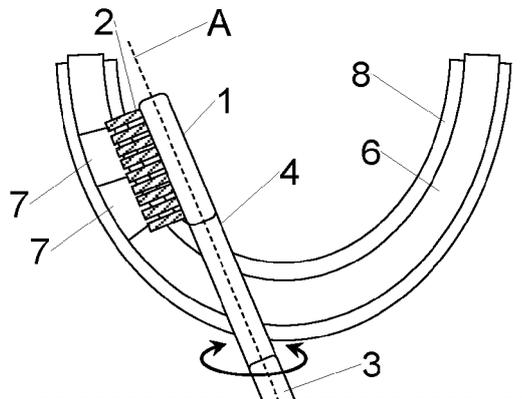


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 24 16 6447

5

DOCUMENTS CONSIDERED TO BE RELEVANT

10

15

20

25

30

35

40

45

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 102 183 121 B1 (LION CORP [JP]) 25 November 2020 (2020-11-25)	1-3,6,8, 10,11, 13,15	INV. A46B9/04
Y	* paragraphs [0042], [0049], [0052], [0066], [0068], [0074]; figure 1 * -----	9	
X	JP 6 734493 B1 (YAMAMOTO MASAYUKI) 5 August 2020 (2020-08-05) * paragraphs [0028], [0030], [0035]; figures 1-4 * -----	1-7,11, 12,14	
Y	US 2013/185881 A1 (SUZUKI TSUYOSHI [JP]) 25 July 2013 (2013-07-25) * paragraph [0064]; figure 2 * -----	9	
A	US 2011/271471 A1 (KIRSH MORDECHAI [IL]) 10 November 2011 (2011-11-10) * figures 26-27 * -----	1-14	
			TECHNICAL FIELDS SEARCHED (IPC)
			A46B

1

The present search report has been drawn up for all claims

50

Place of search The Hague	Date of completion of the search 1 July 2024	Examiner Rossini, Marco
-------------------------------------	--	-----------------------------------

55

EPO FORM 1503 03:82 (P04C01)

CATEGORY OF CITED DOCUMENTS
X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons
.....
& : member of the same patent family, corresponding document

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 24 16 6447

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-07-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 102183121 B1	25-11-2020	CN 108778048 A	09-11-2018
		CN 110063567 A	30-07-2019
		CN 110169647 A	27-08-2019
		CN 110801097 A	18-02-2020
		JP 6341527 B2	13-06-2018
		JP 6385023 B2	05-09-2018
		JP 6385024 B2	05-09-2018
		JP 7149730 B2	07-10-2022
		JP 2018114362 A	26-07-2018
		JP 2018114423 A	26-07-2018
		JP 2018114424 A	26-07-2018
		JP WO2017155033 A1	07-06-2018
		KR 20180085041 A	25-07-2018
		KR 20180114550 A	18-10-2018
		KR 20190057424 A	28-05-2019
		KR 20190057425 A	28-05-2019
		KR 20190057427 A	28-05-2019
		MY 186920 A	26-08-2021
		SG 10202008762Y A	29-10-2020
SG 10202008764Q A	29-10-2020		
SG 11201807607X A	30-10-2018		
TW 201731419 A	16-09-2017		
TW 202130301 A	16-08-2021		
WO 2017155033 A1	14-09-2017		
-----	-----	-----	-----
JP 6734493 B1	05-08-2020	JP 6734493 B1	05-08-2020
		JP 2021122346 A	30-08-2021
-----	-----	-----	-----
US 2013185881 A1	25-07-2013	JP 5451712 B2	26-03-2014
		JP 2013085654 A	13-05-2013
		US 2013185881 A1	25-07-2013
-----	-----	-----	-----
US 2011271471 A1	10-11-2011	CA 2749801 A1	29-07-2010
		EP 2389088 A1	30-11-2011
		IL 196650 A	30-06-2015
		US 2011271471 A1	10-11-2011
		WO 2010084486 A1	29-07-2010
-----	-----	-----	-----

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 102183121 B1 [0002]
- WO 2022138024 A1 [0002]
- WO 9701297 A1 [0004]
- EP 3097821 A1 [0005]
- JP 6734493 B [0007]