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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

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(54) Title: TOOTHPICK WITH BRUSH MEMBER

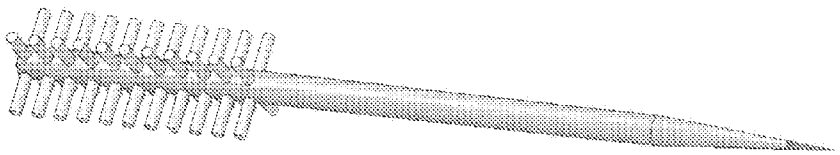

Fig.1

(57) Abstract: The present invention relates to oral hygiene means and is intended for cleaning teeth and interdental spaces. Depending on the variant, a body of the dental stick may be shaped as an elongated cylindrical body or an elongated prism. One end of the dental stick is either pointed or provided with a tip. The second end accommodates cleaning elements in the form of bristles arranged either in lines or spirally and made of a resilient material. The technical result of the invention is the efficient removal of dental plaque and food debris from teeth and interdental spaces of a mouth cavity both on the outside and inside of the teeth.

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TOOTHPICK WITH BRUSH MEMBER

The present invention relates to the hygiene means and is intended for cleaning teeth and interdental spaces.

RU Patent No. 2420248 (priority date 16.03.2010) discloses a dental stick consisting of a rod-like base, at the opposite end of which massaging and cleaning elements are arranged. Both sides of the elongated oval shaped rod-like base are provided with a system of recesses uniformly made over the entire length thereof. One of the ends is provided with a wedge-shaped massaging element having a ridged surface. An opposite end accommodates a cleaning element having a smaller oval cross-section compared to that of the base and provided with protrusions, being perpendicular to the base symmetry axis, and with spherical radii. The cleaning element and protrusions are made elastic and flexible.

Disadvantages of the prior art solutions are as follows:

- lack of a pointed tip resulting in lower cleaning efficiency;
- small number of protrusions also resulting in lower cleaning efficiency.

The published PCT US20080251098 also discloses a dental stick consisting of a rod, bristles and a coating.

Disadvantages of the prior art solutions are as follows:

- lack of a pointed tip at the dental stick end resulting in lower cleaning efficiency;
- random arrangement of bristles resulting in lower cleaning efficiency;
- only one end of the dental stick is usable;
- only one type of cleaning is possible resulting in lower cleaning efficiency.

The technical results to be accomplished based on the asserted invention are as follows:

- a more efficient removal of dental plaque and food debris from teeth and interdental spaces of a mouth cavity both on the outside and inside of the teeth;
- an efficient use of both ends of the dental stick;
- the dental stick is shaped as an elongated prism to allow a firm grip thereof by a hand;
- the bristles are made from a plurality of thin cylindrical fibers which contributes to the higher strength thereof and longer service life of the dental stick;

- the bristles are made in lines, thereby increasing cleaning efficiency;

- the bristles are arranged spirally, thereby allowing the cleaning process to be made continuous.

The essence of the asserted technical solution expressed by a combination of essential features thereof resides in the fact that the technical result to be accomplished is to be realized using the variants of the provided dental stick comprising an elongated body, one end of which is made pointed, while cleaning elements shaped as bristles are arranged at the second end.

Characteristic essential features of the invention allowing the above result to be accomplished consist in that one end of the dental stick is provided with a tip, the bristles are arranged orderly, perpendicular to the body of the dental stick and are equally spaced from each other and between the bristle lines, the number of bristles exceeds four improving thereby the cleaning process. Making the dental stick shaped as an elongated prism according to some variants allows the dental stick to be firmly gripped by hand. Arranging the bristles spirally according to one of the variants allows for a continuous cleaning process. The bristles are made from a plurality of thin cylindrical fibers which contributes to the higher strength thereof and longer service life of the dental stick. The body of the dental stick and bristles are made from a resilient material. The dental stick tip is also made from a resilient material, such as rubber.

The provided variants of the device are related to each other by a single inventive concept in terms of accomplishment of technical results, given that the design unambiguously defines a combination of operations to realize it.

The first variant of the device is characterized by a combination of components: a body and a tip (Fig. 1, 2). The body of the dental stick is shaped as an elongated cylindrical body which takes a form of a truncated cone at one side. A pointed tip is attached to the end of the truncated cone. Four lines of bristles are arranged on the opposite side of the body of the dental stick. The bristles are made in the form of an elongated cylinder. The bristle lines and bristles themselves are equally spaced from each other.

The essence of the asserted device according to the second variant is represented by the same combination of features like in the first variant, except as is specified below. The body of the dental stick is shaped as an elongated prism (right parallelepiped), which takes the form of an equilateral pyramid on one side (Fig. 3, 4). Two lines of bristles are arranged on the opposite side of the body of the dental

stick, with the bristles lines being arranged along two front faces of the body of the dental stick and are parallel to each other.

The essence of the asserted device according to the third variant is represented by the same combination of features like in the first variant, except as is specified below. The body of the dental stick is shaped as an elongated prism (right parallelepiped), which takes the form of an equilateral pyramid on one side (Fig. 5, 6). A single line of bristles is arranged on the opposite side of the dental stick body, on an edge of two front faces thereof.

The essence of the asserted device according to the fourth variant is represented by the same combination of features like in the first variant, except as is specified below. The body of the dental stick is shaped as an elongated prism (right parallelepiped), which takes the form of an equilateral truncated pyramid on one side (Fig. 7, 8). A pointed tip is attached to the end of the pyramid. Two lines of bristles are arranged on the opposite side of the body of the dental stick, with the bristles lines being arranged along two front faces of the body of the dental stick and are parallel to each other.

The essence of the asserted device according to the fifth variant is represented by the same combination of features like in the first variant, except as is specified below. The body of the dental stick is shaped as an elongated prism (right parallelepiped), which takes the form of an equilateral truncated pyramid on one side (Fig. 9, 10). A pointed tip is attached to the end of the pyramid. A single line of bristles is arranged on the opposite side of the dental stick body, on an edge of two front faces thereof.

The essence of the asserted device according to the sixth variant is represented by the same combination of features like in the first variant, except as is specified below. A pointed tip is not attached to the end of the cone (Fig. 11, 12).

The essence of the asserted device according to the seventh variant is represented by the same combination of features like in the first variant, except as is specified below. The bristles are arranged spirally. Spiral turns are equally spaced from each other (Fig. 13, 14).

For further details of the invention, reference is made to the accompanying drawings in which:

Fig. 1 – a general view of the dental stick according to the first variant.

Fig. 2 – a top view of the dental stick according to the first variant.

Fig. 3 – a general view of the dental stick according to the second variant.

Fig. 4 – a top view the dental stick according to the second variant .

Fig. 5 – a general view of the dental stick according to the third variant.

Fig. 6 – a top view the dental stick according to the third variant.

Fig. 7 – a general view of the dental stick according to the fourth variant.

Fig. 8 – a top view the dental stick according to the fourth variant.

Fig. 9 – a general view of the dental stick according to the fifth variant.

Fig. 10 – a top view of the dental stick according to the fifth variant.

Fig. 11 – a general view of the dental stick according to the sixth variant.

Fig. 12 – a top view of the dental stick according to the sixth variant.

Fig. 13 – a side view of the dental stick according to the seventh variant.

Fig. 14 – a top view of the dental stick according to the seventh variant.

Fig. 15. – an enlarged view of a bristle.

The device provided according to the first variant comprises the following structural components: a body shaped as an elongated cylindrical body of the circular cross-section, one end of which is shaped as a truncated cone, while four lines of brisiles are arranged at the second end of the body, with the lines of bristles being arranged along the dental stick body. A pointed tip is attached to the end of the truncated cone, and lines of bristles are arranged parallel to each other and are equally spaced. The bristles in the line are equally spaced from each other (Fig. 1, 2).

The device provided according to the second variant comprises the following structural components: a body shaped as an elongated prism having a double-wedge section, one end of which is shaped as an equilateral pyramid, while two lines of bristles are arranged at the second end of the body, with the lines of bristles being arranged along the dental stick body. The lines of bristles are arranged parallel to each other and the bristles in the line are equally spaced from each other (Fig. 3, 4).

The device provided according to the third variant comprises the following structural components: a body shaped as an elongated prism having a double-wedge section, one end of which is shaped as an equilateral pyramid, while one line of bristles is arranged at the second end of the body, with the line of bristles being arranged along the dental stick body, and the bristles in the line are equally spaced from each other (Fig. 5, 6).

The device provided according to the fourth variant comprises the following structural components: a body shaped as an elongated prism having a double-wedge section, one end of which is shaped as an equilateral truncated pyramid, while two lines of bristles are arranged at the second end of the body on edges thereof, with

two lines of bristles being arranged along the dental stick body, and the bristles in the line are equally spaced from each other. A pointed tip is attached to the end of the truncated cone (Fig. 7, 8).

The device provided according to the fifth variant comprises the following structural components: a body shaped as an elongated prism having a double-wedge section, one end of which is shaped as an equilateral truncated pyramid, while one line of bristles is arranged at the second end of the body on an edge thereof, with the line of bristles being arranged along the dental stick body, and the bristles in the line are equally spaced from each other. A pointed tip is attached to the end of the truncated cone (Fig. 9, 10).

The device provided according to the sixth variant comprises the following structural components: a body shaped as an elongated cylindrical body of the circular cross-section, one end of which is shaped as a cone, while four lines of bristles are arranged at the second end of the body, with the lines of bristles being arranged along the dental stick body. The lines of bristles are arranged parallel to each other and are equally spaced, and the bristles in the line are equally spaced from each other (Fig. 11, 12).

The device provided according to the seventh variant comprises the following structural components: the body is shaped as an elongated cylindrical body, one end of which is shaped as a truncated cone of the circular cross-section, and the bristles are spirally arranged at the second end of the body. A pointed tip is attached to the end of the truncated cone, and turns of bristles are arranged parallel to each other (Fig. 13, 14).

An enlarged view of a bristle comprising a plurality of thin cylindrical fibers is illustrated in Fig. 15.

The device provided according to the variants operates as is described below. The dental stick is held in the hand in the middle portion thereof. The teeth and interdental spaces are cleaned from dental plaquea and food debris both on the outside and inside of the teeth by moving the end of the dental stick with bristles or coil spring in a reciprocating and rotational manner. The second pointed end of the dental stick with a tip or without it is used to remove food debris from the most inaccessible areas.

The analysis of the state-of-the-art shows that such a dental stick is not known in the prior art which contains the features identical to the combination of all essential features of the given technical solution that implies the novelty thereof.

Such variants of combinations of essential features are also not obvious to those skilled in the art that indicates the inventive level of invention.

Implementing this invention actually realizes the provided subject that suggests the industrial applicability.

WHAT WE CLAIM IS:

1. A dental stick, consisting of an elongated body made of a resilient material, one end of which is made pointed, while the bristles are arranged at the other end perpendicular to the body, characterized in that bristles are arranged at least in a single line along the body, with the line having at least 4 bristles.

2. The dental stick according to claim 1, characterized in that each bristle consists of plurality of thin cylindrical fibers.

3. The dental stick according to claim 1, characterized in that the body thereof is shaped as an elongated cylindrical body of the circular cross-section, one end of which is shaped as a truncated cone.

4. The dental stick according to claim 2, characterized in that a pointed tip is attached to the end of the truncated cone.

5. The dental stick according to claim 3, characterized in that the tip is made of resilient material.

6. The dental stick according to claim 1, characterized in that the bristles are arranged along the body at least in 4 lines.

7. The dental stick according to claims 1 and 2, characterized in that bristle lines are arranged parallel to each other and are equally spaced.

8. The dental stick according to claim 1, characterized in that the bristles in the line are equally spaced from each other.

9. The dental stick according to claims 1 and 2, characterized in that the body thereof is shaped as an elongated prism having a double-wedge section, one end of which is shaped as an equilateral truncated pyramid.

10. The dental stick according to claim 9, characterized in that bristles are arranged in dual lines on adjacent faces of the body.

11. The dental stick according to claim 9, characterized in that the bristles are arranged in a single line on the body edge.

12. The dental stick according to claim 9, characterized in that the pointed tip is attached to the end of the truncated pyramid.

13. The dental stick according to claim 12, characterized in that the tip is made of resilient material.

14. The dental stick according to claims 1 and 2, characterized in that the body thereof is shaped as an elongated cylindrical body of the circular cross-section, one end of which is shaped as a cone.

15. The dental stick according to claim 1, characterized in that the body thereof is shaped as an elongated prism having a double-wedge section, one end of which is shaped as an equilateral pyramid.

16. The dental stick according to claim 15, characterized in that the bristles are arranged in dual lines on adjacent faces of the body.

17. The dental stick according to claim 15, characterized in that the bristles are arranged in a single line of the body edge.

18. The dental stick consisting of an elongated body made of the resilient material, one end of which is made pointed, while bristles are arranged at the other end perpendicular to the body, characterized in that bristles are arranged spirally along the body.

19. The dental stick according to claim 18, characterized in that the bristle turns are arranged parallel to each other.

20. The dental stick according to claim 18, characterized in that the bristles are comprised of plurality of thin cylindrical fibers.

21. The dental stick according to claim 18, characterized in that the pointed tip is attached to the end of the truncated cone.

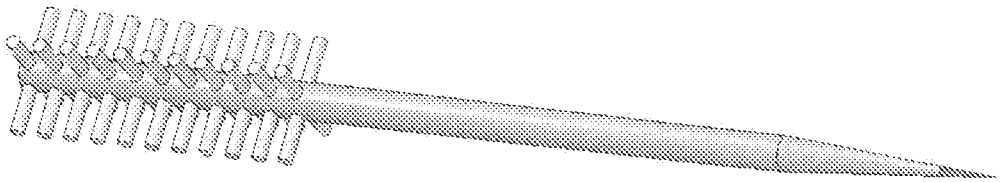

Fig.1

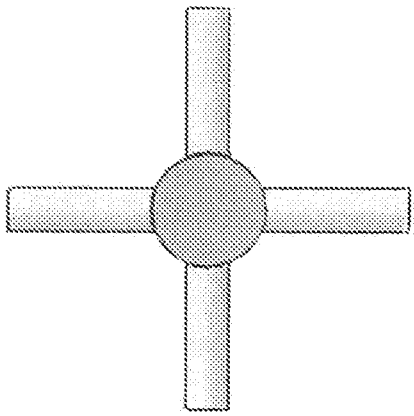

Fig. 2

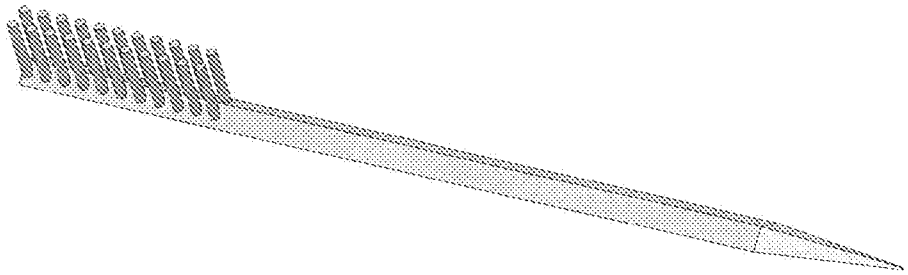

Fig.3

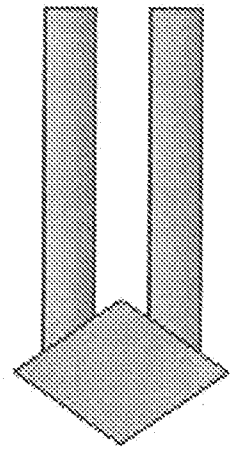

Fig.4

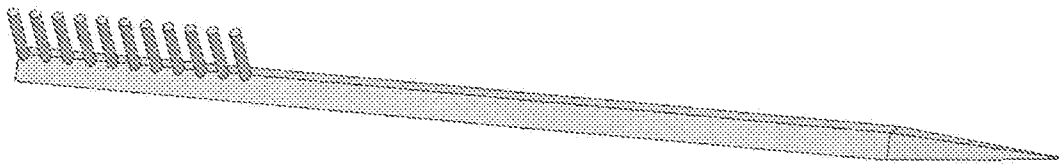

Fig.5

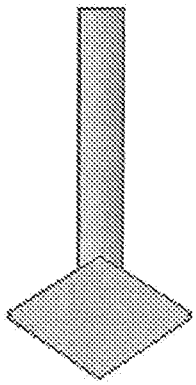

Fig.6

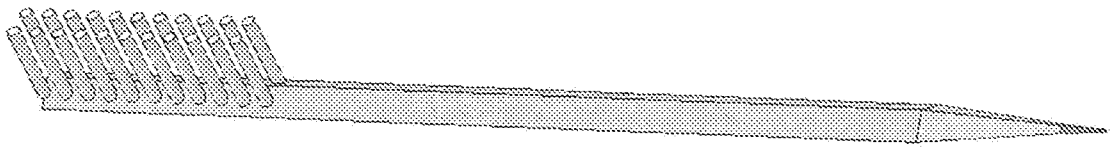

Fig.7

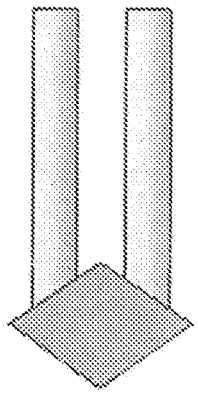

Fig.8

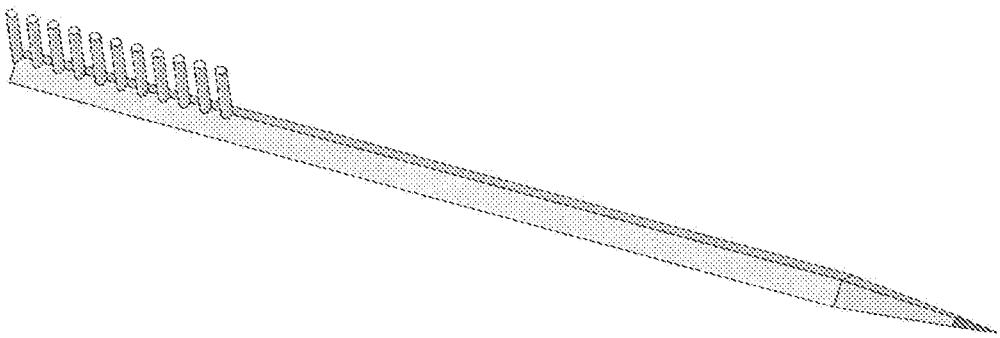

Fig. 9

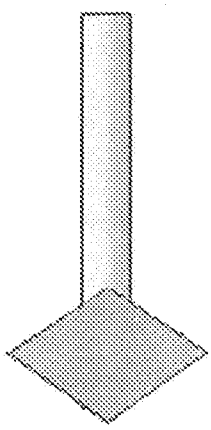

Fig.10

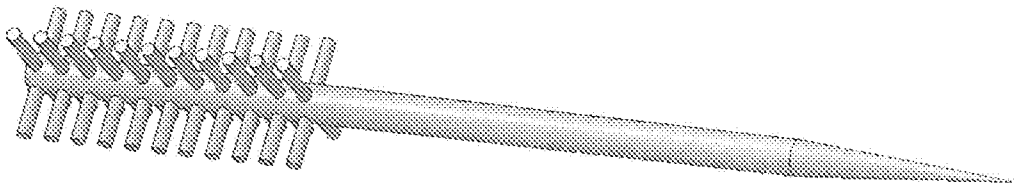

Fig.11

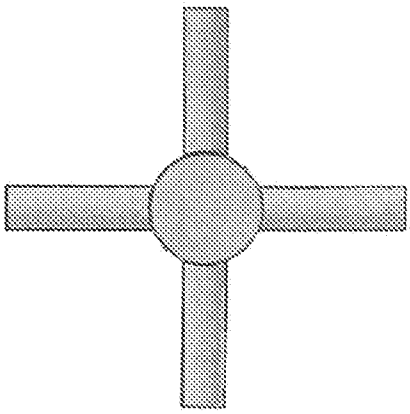

Fig.12

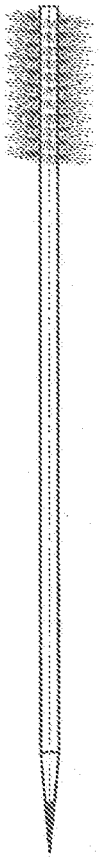

Fig.13

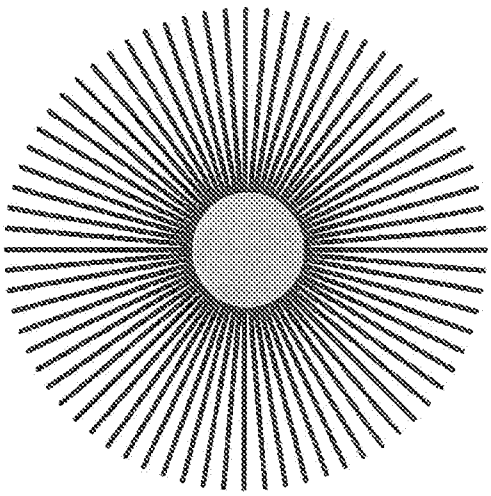

Fig.14

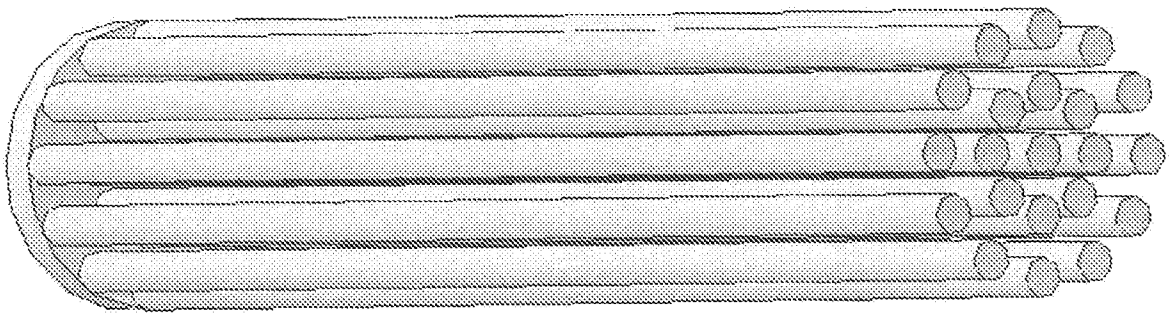

Fig.15

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2015/056748

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61C15/02 A46B15/00
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)
A61C A46B

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

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Y	paragraphs [0034], [0035]; figures 1-3	11,17,18
X	US 2005/118553 A1 (LAGOS GALVAN FLAVIO A [MX]) 2 June 2005 (2005-06-02)	1,3,5, 7-10, 14-16
Y	paragraphs [0001], [0016], [0019], [0046], [0047]; figure 1	11,17,18
X	US 2004/237226 A1 (HOHLBEIN DOUGLAS J [US] ET AL) 2 December 2004 (2004-12-02)	1-5,14
Y	paragraphs [0030], [0033], [0035]; figure 1	12,13

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
25 April 2016	09/05/2016

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	Schmidt, Karsten

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

INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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X Y	US 4 911 187 A (CASTILLO DAVID D [US]) 27 March 1990 (1990-03-27) column 4, line 27 - line 28; figure 4	1,2,6,7, 14 12,13, 18-21

Y	CA 2 881 438 A1 (INTERBROS GMBH [DE]) 13 February 2014 (2014-02-13) figure 7	18-21

Y	WO 88/01154 A1 (BUZZI CARLO ALBERTO [CH]) 25 February 1988 (1988-02-25) figure 4	11,17-21

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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