(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 February 2012 (23.02.2012)

PCT

(10) International Publication Number
WO 2012/022997 A1

(51) International Patent Classification:
A61C 3/10 (2006.01) *B25B 9/02* (2006.01)

(21) International Application Number:
PCT/IB2010/002061

(22) International Filing Date:
19 August 2010 (19.08.2010)

(25) Filing Language: English

(26) Publication Language: English

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK,

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(54) Title: DOUBLE-ARCHED TWEEZERS FOR DENTAL OPERATIONS

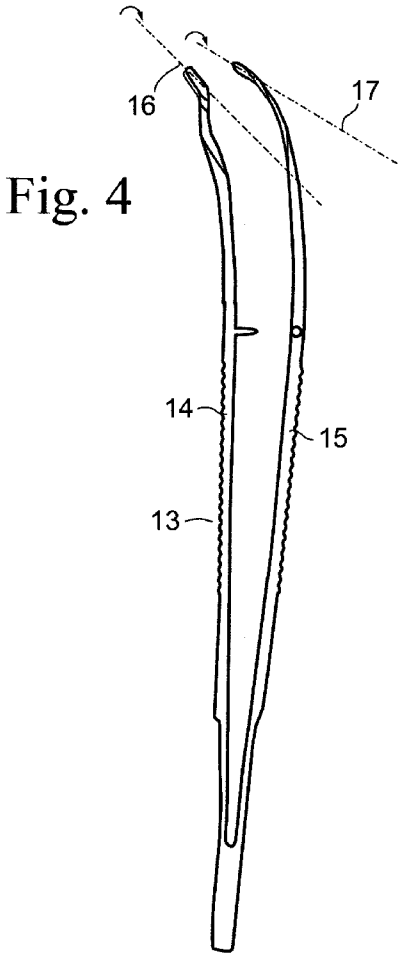

Fig. 4

(57) Abstract: In order to get good access for treatment at hidden parts of the oral cavity, double arched tweezers are disclosed, that can favorably be applied for operations at one or the other side of the mouth and by left- or right-handed dentists.

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SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

Double-Arched Tweezers for Dental Operations

FIELD OF THE INVENTION

The invention relates to dental instruments and more particularly to tweezers used for dental operations.

BACKGROUND OF THE INVENTION

The oral cavity offers a spatially quite limited work area for dental treatment, but accessibility of the target area is crucial for the quality of dental operations. However, tools and equipment hitherto available do not always meet the spatial conditions in the oral cavity:
Some most often treated target areas are situated within the range of the palate or, on backside of the tongue, in the lower jaw.
Right and left tooth rows are to be worked on completely differently, but there is only identical equipment offered for both fields.
Moreover, frequently surfaces of teeth are concerned, which are hidden to direct observation, or are within interdental spaces and thus averted to direct sight, or hidden by template strands, tapes or fixing clips, which inhibit direct access to the working area.
Furthermore the working position of the dentist, facing the oral cavity, is but hardly variable. Thus direct access can only rarely be achieved.

Therefore instruments, that can only be used at straight access to the field of work and which inevitably do not consider a widening angle between the field of work and the pinpointing of the instrument resulting from its handhold position, are actually inappropriate.

PROBLEM TO BE SOLVED

The problem therefore is to find a way to treat these hidden spaces within the oral cavity, particularly safely to place or remove dabbers and to clear off gingival tissue, as well as correctly placing inlays etc.

PRIOR ART

Surprisingly, there had just a small number of disclosures been found, that relate to this or similar problems. However, there are quite a few intellectual property rights applied for tweezers or forceps of different purposes:

So US 3.971.270 is particularly made for stamps, US 4.240.435, US 4.593.694 and WO 2006/134283 A for depilation, WO 90/15579 for removing ticks, WO 2009/114896 A1 for catching head lice, CN 2187450(Y) for handling ophthalmic lenses, DE 195 03 333 C1 for placing pins or screws and DE 198 08 656 A1 for cosmetic self-treatment.

There even are tweezers disclosed for medical operations, as US 5.007.827, a crossover-type to better hold orthodontic braces, or US 6.776.615 B2, for placing strip- or thread-shaped material, held between rod-shaped clamping elements, blockable holding forceps as in DE 11 2006 003 996 T5, or suspended operational forceps with clamping mechanism, as in CN 201005756(Y)

Furthermore, there are quite a few tweezers disclosed, that are collapsible or foldable, as in US 7.625.028 B2 and in US 7.641.248 B2, which consist of special material or are made with a particular production method, as US 6.916.054 B1, or have a particular deign, as e.g. double ended tweezers in WO 2006/065641 A2, forceps with skin-pull arrangement as in CN 201294953 (Y), levered pincettes in WO 2009/074954 A2, tweezers with limited tip pressure in DE 101 55 585 A1, or with levered action as in DE 196 37 618 A1.

But sofar there seem to be no instrument published or made, for to solve the problem of asymmetrical access to operational areas.

INVENTIVE STEP

Considering the imperfectness of existing medical equipment to this point, the solution came with different tests of modified instruments for shoving away gigival and other tissue of the oral cavity, so to get access to zones to be treated and to get clear sight thereof.
With respect to the problem of asymmetrical approach as to the side to be treated, the position of the operator and his/her left- or right-handedness, the application of instruments with an appropriate left or right arching within the horizontal plane proved to be favorable.

In a further step the combination with tweezers or forceps solved the problem of avoiding the application of more instruments than necessary and to find a solution not only to get access to hidden zones, but simultaneously to be able to exactly place orthodontic utilities and implements there.

SUMMARY OF THE INVENTION

The present invention therefore comprises asymmetrical dental tweezers with a differentiation between instruments applied for left and right side.
In case of tweezers it therefore is necessary to bend not only its tips, but also to angle up the end piece against the handles, so to achieve a differentiation between „right "and „left handling". An angle of approximately 45 - 60 degrees –with respect to the tweezers grip– therefore turned out to be appropriate.

For to ensure that the legs of these tweezers are travelling adequately to each other when actuated by pressing them together, one of the two arms is carrying a pin with an adjusted light bending, that inserts into –and thus is guided by– a a flat hole in the opposite arm.

In another embodiment of the invention the tips of the tweezers may carry rounded, dish-type plates for a better grip at dabbers or fine matrices.

Furthermore these plates, as well as ordinary tips may be covered with crushed diamonds, so to secure a better grip.

Moreover, instead of gripping plates, one of the tips may contain a fine metal clip, under which thin films, as used for separations, may be clamped and transported to their destination.

In a further embodiment the tweezers tips may be modified in a way, that the outer ends of the tips carry a wedge-shaped hypomochlion on both sides with a spacing of 3 to 4 Millimeters. This can be used as interdental lever for many applications.

DESCRIPTION OF THE DRAWINGS

The invention is further disclosed in detail with the following drawings, wherein:

Fig. 1 shows in top view straight tweezers 1 of a basic kind, wherein both tips are forged downwards (not to be recognized on a top view) comprising a straight pin 2 and a guiding hole 3.
This drawing is only for comparison with Fig. 2 and Fig. 3.

Fig. 2 discloses the left type of asymmetric tweezers 5 in the same top view, where the left arm 6 is bent to the right side, whereas the right arm 7 has a little different bending line, so to achieve exact closing of the tips 8 and 9.
Also for this purpose, the pin 10 on the left arm of these tweezers is also a little bent, for to pass through the guiding hole 11 on the right arm at changing geometrical positions of pin and hole in their movement.

Fig. 3 discloses the right-handed version 12 of the tweezers, built symmetrical to the left handed version in Fig. 2.

Fig. 4 shows a left-handed tweezer 13, the arms 14 and 15 of which are twisted to left side along their axis 16 and 17 .

Fig. 5 shows the tweezers 25, wherein a slit 26 forms a miniature clamping device, suited to hold thin films or matrices, that need to be held in place when filling gaps in one tooth to prevent adhesion to a neighbouring one.
An attached detail drawing shows one of the tips 20, comprising a slit 21 for clamping fine threads for operational application within.

WHAT IS CLAIMED IS:

1. Double-arched tweezers for Dental Operations, wherein the arms and tips of said tweezers are bent or arched in their horizontal plane - in addition to a possible downward forging of the tips.

2. Double-arched tweezers as to claim 1, wherein its arms are additionally twisted around their horizontal axes along with their bending.

3. Double-arched tweezers as to claim 1, wherein the horizontal angle between the axis of the handholds an the tips is between 45 and 60 degrees.

4. Double-arched tweezers as to claim 1, comprising a guiding rod and hole, wherein the guiding rod is bent to follow the movevent of the arms in a suite of adequate angles.

5. Double-arched tweezers as to claim 1, comprising rounded holding plates at their tips.

6. Double-arched tweezers as to claim 1, comprising lay-ups of crushed Diamonds at the holding side of their tips.

7. Double-arched tweezers as to claim 1, comprising a fine slit at the top of one of the arms, forming a clamping fixture for fine threads.

8. Double-arched tweezers as to claim 1, comprising another slit at the butt of the common base, forming a miniature clamping device for slipping in and holding thin films or matrices.

9. Double-arched tweezers as to claim 1, comprising wedge-shaped hypomochli-ae on both sides of the outer ends of their tips with a spacing of 3 to 4 Millimeters within.

* * * * *

Fig. 1

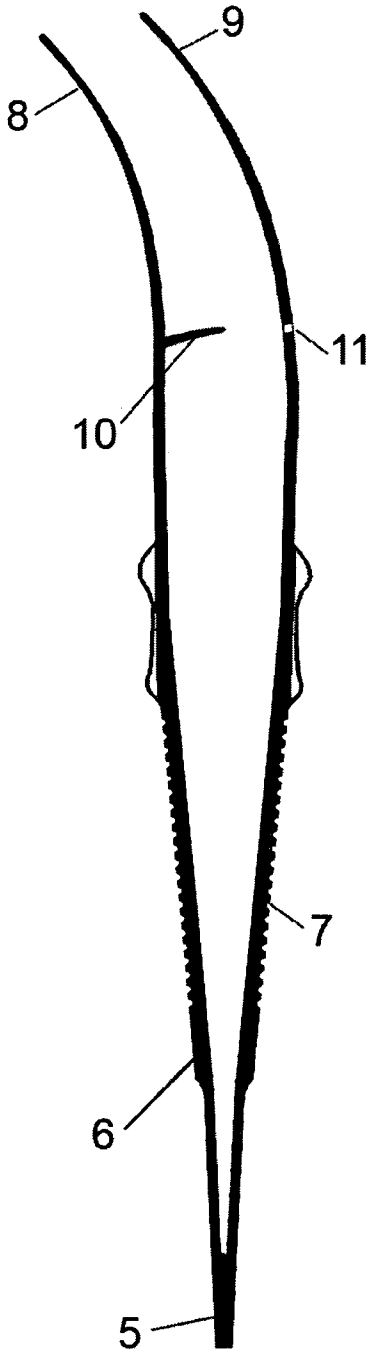


Fig. 2

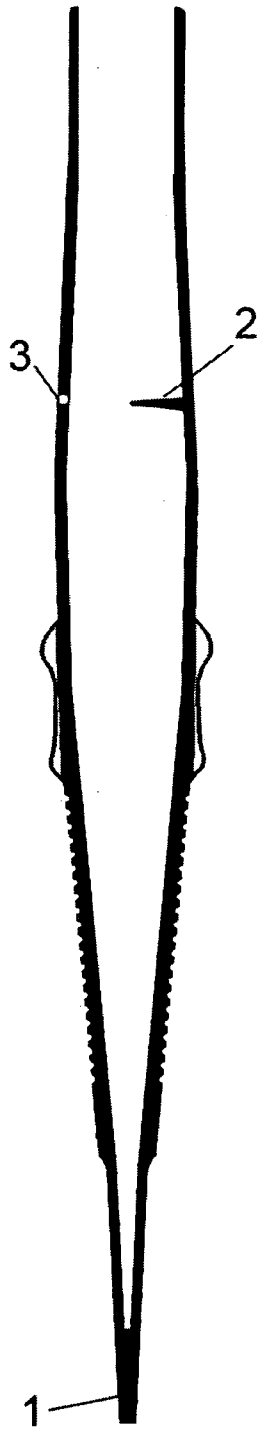


Fig. 3

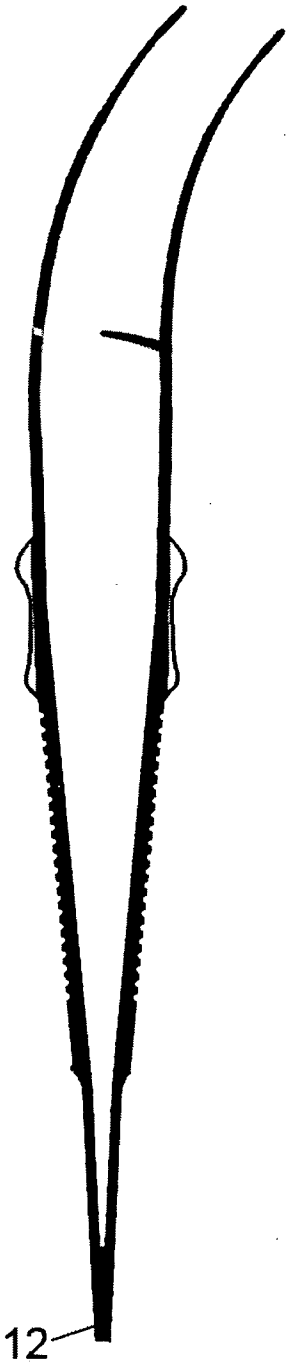
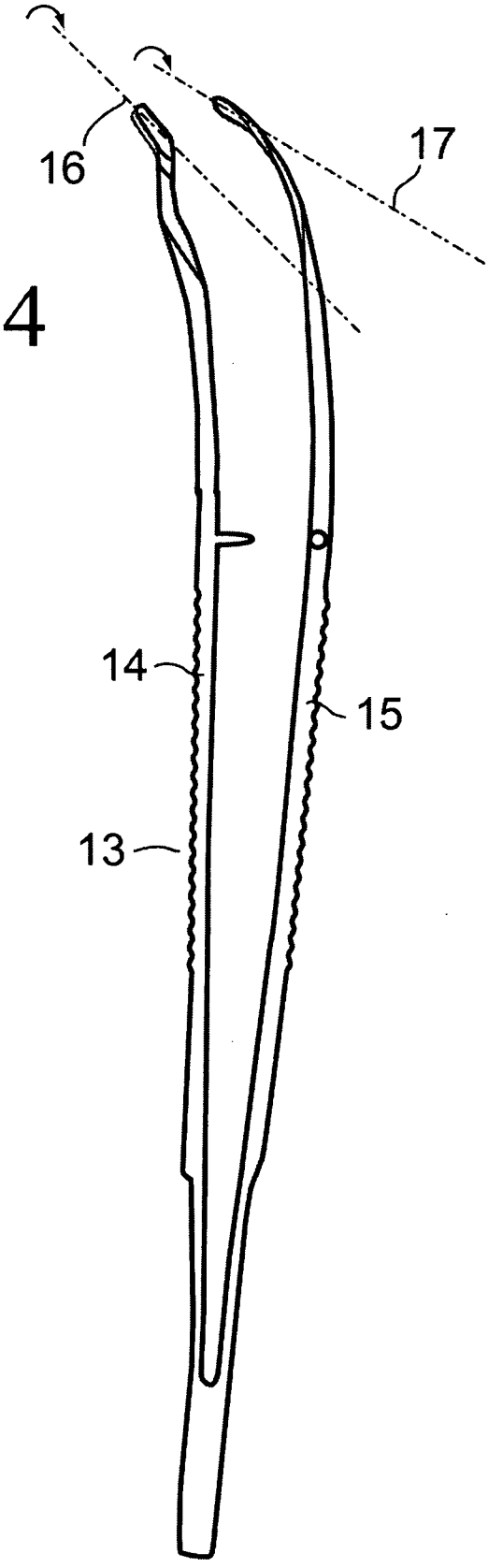


Fig. 4



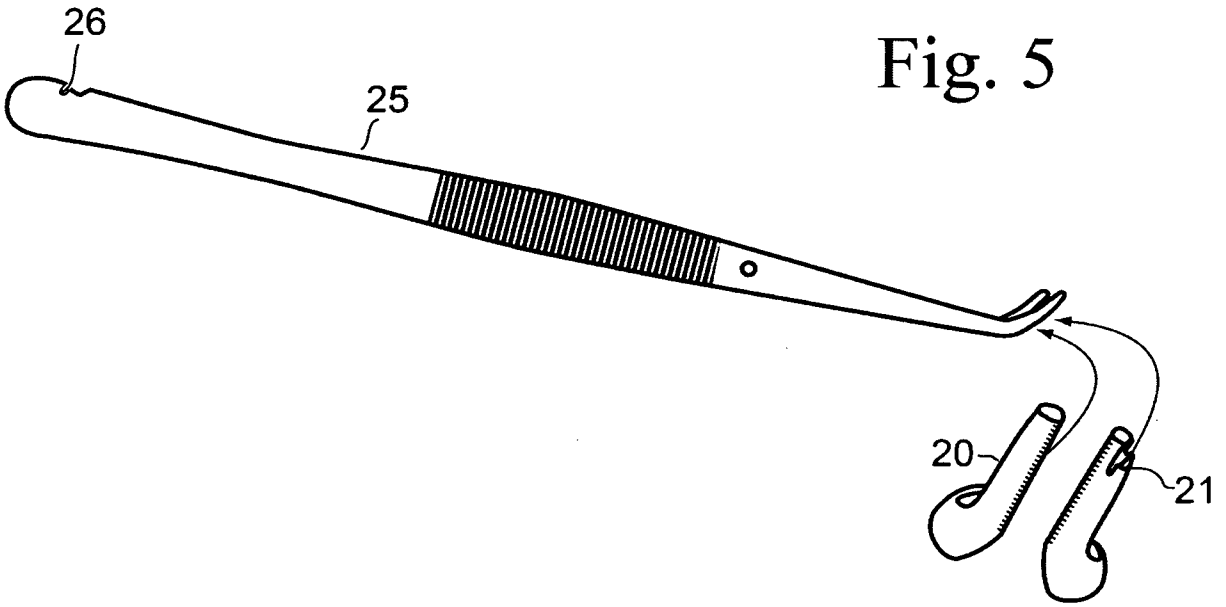


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/002061

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61C3/10 B25B9/02
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 B25B A45D

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 practical, search terms used)
EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	US 6 322 363 B1 (BEECHER CANDACE L [US] ET AL) 27 November 2001 (2001-11-27) column 2, line 58 - column 3, line 28; figures 8-11	1 3,5-7,9 2,4,8
Y	US 2002/106609 A1 (PALERMO ROSANNE M [US] ET AL) 8 August 2002 (2002-08-08) paragraph [0034]; figures 1,3-15	3,7
Y A	DE 10 2004 032558 A1 (BROZIO DIRK [DE]) 2 February 2006 (2006-02-02) paragraph [0011]; figure 1	5 6
Y	DE 37 30 348 A1 (KARL HAMMACHER GMBH [DE]) 30 March 1989 (1989-03-30) column 1, lines 58-68; figures 1,2	6

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

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 April 2011	04/05/2011

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/002061

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 195 03 333 C1 (ANDRESEN CARSTEN [DE]) 14 March 1996 (1996-03-14) cited in the application column 1, lines 27-39; figures 1-4 -----	7
Y	DE 298 08 043 U1 (MUELLER PETER DR [DE]) 30 July 1998 (1998-07-30) page 2, lines 8-15; figures 1-5 -----	9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2010/002061

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6322363 B1	27-11-2001	NONE	
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DE 29808043 U1	30-07-1998	NONE	