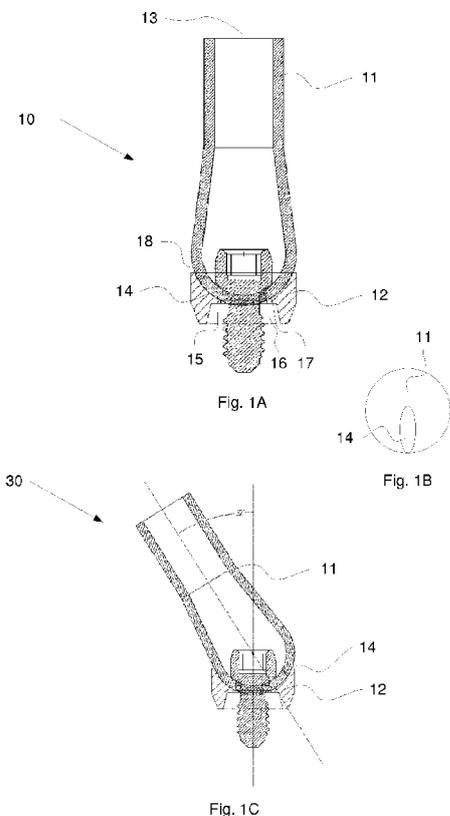




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[Continued on next page]

(54) Title: DENTAL SUPERSTRUCTURE AND METHOD FOR MANUFACTURING THE SAME



(57) Abstract: A method (30) for manufacturing a dental superstructure or part thereof is provided. The method comprises the steps of (i) making (31) a dental imprint from the mouth of a subject; (ii) mounting (32) an analog in the imprint to obtain a working model; (iii) attaching (33) a screw channel directing device (10, 20), comprising a screw channel part (11, 21) and an implant cooperating part (12, 22), said screw channel part (11, 21) being tiltable in relation to the implant cooperating part (12, 22), to the working model; (iv) tilting (34) the screw channel part (11, 21) in relation to the implant cooperating part (12, 22) into a desired angle; (v) shaping a mold creating a master superstructure or part thereof onto the screw channel directing device (10, 20); (vi) forming (37) a mold based on the master superstructure or part thereof; and (vii) casting (38) or CAD/CAM shaping of the dental superstructure or part thereof. Embodiments of screw channel directing devices are also provided.



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

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# INTERNATIONAL SEARCH REPORT

International application No PCT/EP2012/059152
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. A61C8/00                      A61C13/34 ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols) A61C				
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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	EP 1 810 641 A1 (XAM-MAR MANGRANE ESTEBAN [ES]) 25 July 2007 (2007-07-25) the whole document -----	1-4		
X	WO 01/47429 A1 (UNGER HEINZ DIETER [DE]) 5 July 2001 (2001-07-05) page 7, line 8 - page 9, line 7 -----	1-3		
A	WO 01/05326 A1 (LUSTIG L PAUL [US]; CASTELLUCCI FREDERICO [US]; TYBINKOWSKI ANDREW P []) 25 January 2001 (2001-01-25) page 20, line 3 - page 23, line 21; figures 37-43 -----	1-4		
A	WO 2006/048150 A1 (PROFIM LTD [GB]; UNGER HEINZ-DIETER [DE]) 11 May 2006 (2006-05-11) page 12, line 6 - page 13, line 29; figure 1 -----	1-4		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top; padding: 2px;">                     "A" document defining the general state of the art which is not considered to be of particular relevance                      "E" earlier application or patent but published on or after the international filing date                      "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)                      "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                 </td> <td style="width: 50%; border: none; vertical-align: top; padding: 2px;">                     "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                      "&amp;" document member of the same patent family                 </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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  <p style="text-align: center; font-size: 1.2em;">5 November 2012</p>		Date of mailing of the international search report  <p style="text-align: center; font-size: 1.2em;">28/01/2013</p>		
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  <p style="text-align: center; font-size: 1.2em;">Arduin, H�el�ene</p>		

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2012/059152

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-4

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4

Manufacturing a dental superstructure or part thereof, comprising the steps of (i) making a dental imprint from the mouth of a subject; (ii) mounting an analog in the imprint to obtain a working model; (iii) attaching a screw channel directing device, comprising a screw channel part and an implant cooperating part, said screw channel part being tiltable in relation to the implant cooperating part, to the working model; (iv) tilting the screw channel part in relation to the implant cooperating part into a desired angle; (v) shaping a mold creating a master superstructure or part thereof onto the screw channel directing device; (vi) forming a mold based on the master superstructure or part thereof; and (vii) casting or CAD/CAM shaping of the dental superstructure or part thereof.

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2. claim: 5

A screw channel directing device, comprising a screw channel part and an implant cooperating part, said screw channel part comprising a screw channel mouth in the distal end, and a screw member seat with a screw hole in the proximal end, wherein the proximal end of the screw channel part is bowl shaped, such that the inner bottom surface has a concave shape and its outer bottom surface has a convex shape, and wherein the screw hole of the screw member seat is a long hole, and wherein said implant cooperating part is collar-shaped with an implant seat at its proximal end, and a distal concave screw channel part seat, wherein the screw channel part seat has a radius corresponding to the radius of the outer bottom surface of the screw channel part to form a ball joint, such that the central axis of the screw channel part may be tilted/angled in relation to a central axis of the implant cooperating part.

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3. claims: 6-10

A screw channel directing device, comprising a screw channel part and an implant cooperating part, said screw channel part comprising a screw channel mouth in the distal end, and a screw member with a distal gripping portion in the proximal end, said screw member being arranged in a screw member seat at the bottom proximal end of the screw channel; said screw member has a screw member head in the proximal end; said screw member head has a head configuration in form of a peripheral contour, adapted for cooperation with the implant cooperating part and said screw channel part comprises a concave interaction surface for cooperation with a convex interaction surface on the implant cooperating part

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

to form a ball joint, said screw member head having a slanting distal contact surface for cooperation with a contact surface on the implant cooperating part when the central axis of the screw channel part is angled in relation to the central axis of the implant cooperating part.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2012/059152
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1810641	A1	25-07-2007	EP 1810641 A1 25-07-2007 WO 2006024680 A1 09-03-2006
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