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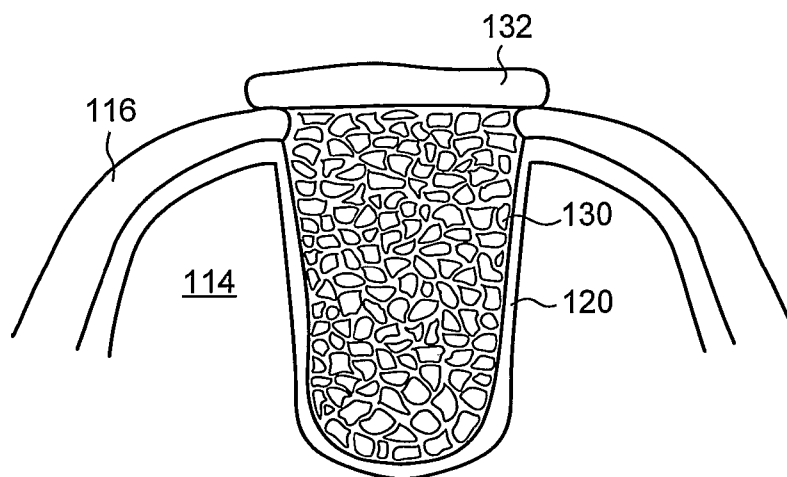


FIG. 2

(57) Abstract: Dental patch (132) and method for temporarily covering a tooth socket of a patient, the dental patch made of a bio-compatible material such as silicone or titanium foil, the dental patch positioned over the tooth socket (120) immediately after the bone grafting of the tooth socket following a tooth extraction, the dental patch attached to the gums adjacent to the tooth socket, such as by suturing the periphery of the dental patch to the gums, the dental patch maintained over the tooth socket until the formation of a thin gum tissue layer between the dental patch and the bone graft material and then removed from the tooth socket, allowing a dental implant procedure to be performed at the tooth socket after sufficient calcification of the bone graft material, the dental patch may be enforced with a metallic structure.



TOOTH SOCKET COVERING

FIELD OF THE DISCLOSED TECHNIQUE

The disclosed technique relates to periodontal procedures in
5 general, and to the preparation of a tooth socket for receiving a dental
implant in particular.

BACKGROUND OF THE DISCLOSED TECHNIQUE

After the loss of a tooth (e.g., due to injury, disease, or tooth
10 extraction), the exposed alveolar bone gradually undergoes bone
resorption, in which the bone tissue is broken down and removed by
osteoclasts. As this process continues, the alveolar ridge diminishes in
height and width and becomes unable to support a dental implant or other
type of tooth replacement. The resorption of the alveolar bone may also
15 lead to occlusion problems, limited facial support and adverse aesthetic
consequences. It is usually necessary to perform a bone graft in the
alveolus (i.e., tooth socket) after tooth loss, in order to maintain the
alveolar ridge and to provide sufficient support for a dental implant to
securely integrate. The bone graft material, which may be bone taken
20 from the patient's own body (autograft), from a different person (allograft),
from a different species (xenograft), or synthetic bone substitute (e.g.,
collagen, ceramics, calcium phosphate or other synthetic materials), is
inserted into the alveolus. Subsequently, the area is covered with adjacent

gum tissue, by means of gingival flap surgery to separate a flap of gum tissue, which is temporarily secured over the area. Gingival flap surgery is a time intensive process, which involves substantial pain for the patient, and must be performed by a skilled dental specialist, such as a maxillofacial surgeon or a periodontist. Other known techniques involve placing layers of membrane in between the bone graft material, such as a free graft harvested from the palate. After sufficient new bone growth in the alveolus and hardening of the bone graft material, a dental implant procedure may then be performed to replace the previous tooth. The dental implant may also be inserted during the bone grafting.

US Patent No. 6,325,627 to Ashman, entitled "Method and apparatus for performing ridge preservation and implant treatment", is directed towards the installation of bone graft material and an implant in a root extraction socket following a root extraction. The dental surgeon drills a hole (3-6mm) apically into the root extraction socket following the extraction, into which the implant is firmly anchored. The surrounding area is filled with hydrated bone graft material (e.g., using blood from the surgical area of the patient's alveolar marrow), to promote new bone growth. The bone graft material may be covered and held in place with a surgical foil, collagen dressing, or by a barrier membrane formed when a synthetic bone alloplast is used as the bone graft material. The installation of the implant may alternatively be delayed until a later time (e.g., for 2-12

months) until sufficient bone growth has been promoted at the extraction socket.

US Patent No. 6,394,807 to Robinson, entitled "Guided tissue regeneration plate for use in a process for growing jaw bone in anticipation
5 of performing dental implants", is directed towards a plate that promotes growth of atrophied maxillary or mandibular bone to obtain an adequate volume of osseous structure. The plate is secured to the jaw bone by a tenting-type support screw, fixing the guided-tissue regeneration plate some distance from the surface of the bone. A space free from chewing
10 pressure is created, supported by a mesh, between the underside of the gum tissue and the original bone.

US Patent No. 7,314,375 to Gault, entitled "Provisional dental implant for preparing an alveolus", is directed towards a temporary dental implant for preparing the alveola of an extracted tooth for the subsequent
15 insertion of a definitive dental implant. The temporary implant includes a separable coronary part, which covers and seals a radicular part (e.g., with a temporary cement). The radicular part is hollow and partially porous, may be shaped to match the extracted tooth, and allows diffusion of one or more active substances into the alveola. The temporary implant is held in
20 place, such as by suturing or adhesion, and is removed after a certain period (a few weeks to months) during which the alveola has healed sufficiently.

US Patent No. 7,393,493 to Ashman, entitled "Crosslinkable polymeric materials and their applications", is directed towards a composition useful for dental, orthopedic and drug delivery applications. The composition includes a curable admixture of a bone substitute and a crosslinkable prepolymer, which allows the structure to be shaped before it cures. The composition can be used to fill extraction sockets, prevent or repair alveolar bone loss, provide ridge augmentation, and stabilize and support a dental implant while providing immediate function (e.g., chewing).

US Patent application publication No. 2007/0160954 to Steiner, entitled "Method and device for regenerating bone in preparation for dental implant", is directed towards a device that is placed into an extraction socket, filling the space left behind after a tooth extraction. The device, referred to as a core, is inserted into the socket filled with bone graft material, at a depth and angle similar to that of the previous tooth. The core and surrounding bone graft may be covered by an ovate pontic. After the bone graft is resorbed and replaced with bone, the core is removed from the socket, producing a bone void in which a dental implant can be placed. The core may be shaped as a straight or tapered cylinder.

20

SUMMARY OF THE DISCLOSED TECHNIQUE

In accordance with one aspect of the disclosed technique, there is thus provided a dental patch operational for temporarily covering a tooth socket of a patient. The dental patch is made of a biocompatible material, such as silicone or titanium foil, and is positioned over the tooth socket immediately after bone grafting of the tooth socket following a tooth extraction. The dental patch is attached to the gums adjacent to the tooth socket, and maintained over the tooth socket until the formation of a thin gum tissue layer between the dental patch and the bone graft material, after which it is removed from the tooth socket, allowing a dental implant procedure to be performed at the tooth socket after sufficient calcification of the bone graft material.

In accordance with another aspect of the disclosed technique, there is thus provided a method for temporarily covering a tooth socket of a patient who has undergone a bone graft following a tooth extraction. The method includes the procedure of positioning a dental patch made of a biocompatible material, such as silicone or titanium foil, over the tooth socket immediately after the bone graft. The method further includes the procedures of attaching the dental patch to the gums adjacent to the tooth socket, maintaining the dental patch over the tooth socket until the formation of a thin gum tissue layer between the dental patch and the bone graft material, and removing the dental patch, allowing a dental

implant procedure to be performed at the tooth socket after sufficient calcification of the bone graft material.

In accordance with a further aspect of the disclosed technique, there is thus provided a method for performing a tooth replacement on a patient. The method includes the procedures of extracting a tooth from a tooth socket of the patient, and performing a bone graft in the tooth socket. The method further includes the procedure of temporarily covering the tooth socket filled with bone graft material, by positioning a dental patch made of a biocompatible material, such as silicone or titanium foil, over the tooth socket immediately after the bone graft, attaching the dental patch to the gums adjacent to the tooth socket, maintaining the dental patch over the tooth socket until the formation of a thin gum tissue layer between the dental patch and the bone graft material, and removing the dental patch. The method further includes the procedure of performing a dental implant procedure at the tooth socket after sufficient calcification of the bone graft material.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed technique will be understood and appreciated more fully from the following detailed description taken in conjunction with the drawings in which:

5 Figure 1 is a schematic illustration of the anatomy of a tooth situated in a tooth socket;

 Figure 2 is a schematic illustration of a dental patch covering a tooth socket that has undergone bone grafting, in accordance with an embodiment of the disclosed technique;

10 Figure 3 is a perspective view of a dental patch, constructed and operative in accordance with an embodiment of the disclosed technique;

 Figure 4 is a schematic illustration of a dental implant performed on a calcified bone graft, following the removal of a dental patch from over the tooth socket, in accordance with an embodiment of the disclosed
15 technique;

 Figure 5 is a schematic illustration of a dental patch covering a tooth socket with bone graft material and a dental implant, in accordance with another embodiment of the disclosed technique;

 Figure 6A is a perspective view of a dental patch enforced with
20 wires longitudinally, constructed and operative in accordance with an embodiment of the disclosed technique;

Figure 6B is a perspective view of a dental patch enforced with wires longitudinally and laterally, constructed and operative in accordance with another embodiment of the disclosed technique;

Figure 6C is a perspective view of a dental patch enforced with a
5 grid structure, constructed and operative in accordance with a further embodiment of the disclosed technique;

Figure 6D is a perspective view of a dental patch internally enforced with a net structure, constructed and operative in accordance with yet another embodiment of the disclosed technique;

10 Figure 6E is a perspective view of a dental patch externally enforced with a net structure, constructed and operative in accordance with yet a further embodiment of the disclosed technique; and

Figure 7 is a flow diagram of a method for performing a tooth replacement, operative in accordance with an embodiment of the
15 disclosed technique.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The disclosed technique overcomes the disadvantages of the prior art by providing a patch of material, made of silicone or titanium foil, which is positioned over the tooth socket (dental alveolus) after a bone
5 graft, to protect the area during bone regeneration.

Reference is made to Figure 1, which is a schematic illustration of the anatomy of a tooth situated in a tooth socket. A tooth 102 includes enamel 104, dentin 106, pulp chamber 108, nerves and blood vessels 110 and root ending 112. Tooth 102 is held inside the tooth socket formed by
10 the alveolar bone 114 that is part of the jawbone (i.e., the maxilla or mandible). Tooth 102 is surrounded by gingiva 116 (i.e., gum tissue) that is attached to the alveolar bone 114. The root of tooth 102 is covered with a layer of cementum 118 (bone-like tissue), which is anchored to alveolar bone 114 through periodontal ligaments 120.

15 After a tooth has been extracted, bone grafting may be necessary to provide sufficient bone for the secure integration of a dental implant. Reference is now made to Figures 2 and 3. Figure 2 is a schematic illustration of a dental patch covering a tooth socket that has undergone bone grafting, in accordance with an embodiment of the
20 disclosed technique. Figure 3 is a perspective view of a dental patch, constructed and operative in accordance with an embodiment of the disclosed technique. The tooth socket is filled with bone graft material 130. Immediately following the bone grafting, a dental patch 132 is

positioned over the tooth socket to cover the area. Dental patch 132 is a rectangular segment of silicone material, with dimensions (i.e., length l , width w , and thickness t) suited to facilitate its placement and coverage over a particular tooth socket. Dental patch 132 is attached to the gingiva
5 116 adjacent to the tooth socket, such as by suturing the periphery of dental patch 132 to the gingiva 116. A resorbable material, such as collagen or a gel foam, may be applied over bone graft material 130 prior to the placement of dental patch 132, in order to facilitate the formation of a blood clot on the area, to isolate bone graft material 130 from direct
10 contact with dental patch 132, and to enable the quick formation of a soft gum tissue layer.

Subsequently, the bone graft material 130 undergoes resorption, and there is a gradual formation of new bone in the alveolar ridge (e.g., osteogenesis). After the formation of a thin layer of soft gum tissue over
15 bone graft material 130 which covers and protects the area (typically after about 2-3 weeks), dental patch 132 is removed from over the tooth socket. After sufficient calcification of bone graft material 130, a dental implant procedure may be performed. The bone graft calcification period may vary for different patients and for different types of grafting material, but
20 generally takes about 3-6 months. The presence of dental patch 132 causes a thinner layer of gum tissue to grow than would normally, and prevents the penetration of this gum tissue into the bone graft material 130. Dental patch 132 further stabilizes bone graft material 130 in a fixed

position and prevents it from escaping out of the tooth socket, while promoting the initial calcification process. Dental patch 132 also protects bone graft material 130 from germs, bacteria and food debris inside the mouth and ensures that the area remains sufficiently sterilized.

5 Furthermore, as compared with gingival flap surgery, the suturing of dental patch 132 to the gums is a simpler procedure for the dental practitioner, as well as far less painful for the patient.

Reference is now made to Figure 4, which is a schematic illustration of a dental implant performed on a calcified bone graft,

10 following the removal of a dental patch from over the tooth socket, in accordance with an embodiment of the disclosed technique. After removal of dental patch 132 and calcification of bone graft material 130 (Figure 2), calcified bone graft 134 undergoes an osteotomy. A dental implant 138, such as a threaded titanium screw, is inserted into the prepared gap, and

15 a new dental crown 136 is affixed to dental implant 138. It is appreciated that the crown may be affixed by other means, or using other types of dental implantation techniques known in the art.

According to another embodiment of the disclosed technique, a dental implant is inserted into the tooth socket after it is filled with bone

20 graft material, and then the dental patch is placed over the tooth socket. Reference is now made to Figure 5, which is a schematic illustration of a dental patch covering a tooth socket with bone graft material and a dental implant, in accordance with another embodiment of the disclosed

technique. Dental implant 138 is inserted into the bone graft material 130 immediately after the bone graft procedure. Subsequently, dental patch 132 is positioned over the tooth socket, covering both the bone graft material 130 and the dental implant 138 embedded therein. Dental patch 5 132 is removed after about 2-3 weeks (i.e., after the formation of the soft tissue layer), and the dental implant 138 is left to complete osseointegration with alveolar bone 114. The osseointegration process usually takes several months. A dental crown 136 (Figure 4) (e.g., a temporary crown) can be attached directly to dental implant 138 after 10 implant 138 has been exposed (a temporary crown may be replaced by a permanent crown after full osseointegration has occurred).

It is noted that the positioning and attachment of dental patch 132 is performed quickly and relatively painlessly for the patient. Dental patch 132 eliminates the need for gingival surgery, and thus the process 15 may be performed by a general dentist, rather than a skilled surgical specialist, such as a maxillofacial surgeon or a periodontist. Dental patch 132 may be considered a temporary replacement of the mucous membrane of the gingival flap until it is removed after the formation of the thin gum tissue layer. As compared with prior art tooth replacement 20 techniques, the use of dental patch 132 in accordance with the disclosed technique serves to accelerate and enhance the calcification of the bone graft material, promote proper healing while preventing undesirable processes in the treated area, and eliminate painful and time consuming

surgical procedures, thus ensuring a quicker and healthier recovery and minimal patient suffering.

Referring back to Figure 3, dental patch 132 is typically composed of silicon (i.e., medical silicon), but may alternatively be
5 composed of a different type of biocompatible material, such as titanium foil. Dental patch 132 is typically rectangular in shape, but may be formed in any shape that facilitates its placement and coverage on the tooth socket area. The dimensions of dental patch 132 can be, for example: l = approximately 15mm; w = approximately 10mm; and t = approximately
10 0.1-0.9mm and preferably approximately 0.4-0.7mm. The silicone (or titanium foil) may be initially fabricated in the form of a single sheet (or strip), which may be cut by the dental practitioner (or an assistant) in a desired shape or size to fit over the tooth socket type (e.g., incisors, molars, and the like) to be treated. Alternatively, the dental patches may
15 be prefabricated in various predefined shapes and sizes to fit the treated area, and the dental practitioner can select a suitable dental patch for use. The dental patch (or the prefabricated sheet) may be kept in a sealed packaging, which is opened by the dental practitioner (and cut into the desired shape if necessary) immediately before the dental patch is to be
20 placed over the tooth socket. The dental patch is generally designed to allow simple insertion and removal.

Dental patch 132 may be enforced by a metallic structure, such as a wire structure, a net structure, or a grid structure. The enforcement

structure may also have a different form. The enforcement structure may be composed of titanium or another suitable material. The enforcement modifies the resilience of the silicone and allows for the enduring shaping or structuring of dental patch 132, for example in a convex form that is suited to the bulbous or globular shape of the tooth socket filled with bone graft material. Reference is made to Figures 6A, 6B, 6C, 6D and 6E. Figure 6A is a perspective view of a dental patch (referenced 142) enforced with wires longitudinally, constructed and operative in accordance with an embodiment of the disclosed technique. Figure 6B is a perspective view of a dental patch (referenced 144) enforced with wires longitudinally and laterally, constructed and operative in accordance with another embodiment of the disclosed technique. Figure 6C is a perspective view of a dental patch (referenced 146) enforced with a grid structure, constructed and operative in accordance with a further embodiment of the disclosed technique. Figure 6D is a perspective view of a dental patch (referenced 148) internally enforced with a net structure, constructed and operative in accordance with yet another embodiment of the disclosed technique. Figure 6E is a perspective view of a dental patch (referenced 150) externally enforced with a net structure, constructed and operative in accordance with yet a further embodiment of the disclosed technique. The enforcement structures depicted in Figures 6A, 6B, 6C and 6D, respectively, are embedded within the dental patch. The enforcement structure depicted in Figure 6E is attached to at least one of

the outer surfaces of dental patch 150 (e.g., at the top, at the top and at the bottom, and the like).

Reference is now made to Figure 7, which is a flow diagram of a method for performing a tooth replacement, operative in accordance with an embodiment of the disclosed technique. In procedure 162, a tooth is
5 extracted from a tooth socket of a patient. In procedure 164, a bone graft is performed in the tooth socket, following the tooth extraction. It is noted that the term "tooth extraction" as used herein also encompasses involuntary tooth loss, such as the loss of a tooth due to injury, trauma,
10 disease, and the like. In procedure 166, a dental patch is positioned over the tooth socket immediately after the bone graft. In procedure 168, the dental patch is attached to the gums adjacent to the tooth socket. With reference to Figures 2 and 3, dental patch 132 is positioned over a tooth socket filled with bone graft material 130, and then attached to the gums
15 116, such as by suturing the periphery of dental patch 132 to gums 116 at the edge of the tooth socket.

In procedure 170, the dental patch is maintained over the tooth socket until the formation of a thin gum tissue layer between the dental patch and the bone graft material. In procedure 172, the dental patch is
20 removed. With reference to Figure 2, dental patch 132 is removed from the tooth socket after a thin layer of gum tissue has formed over bone graft material 130 (after about 2-3 weeks). In procedure 174, a dental implant procedure is performed at the tooth socket after sufficient calcification of

the bone graft material. With reference to Figure 4, dental implant 138 is inserted into calcified bone graft 134 (after about 3-6 months), and a dental crown 136 is affixed to dental implant 138. With reference to Figure 5, dental implant 138 may alternatively be inserted into bone graft material 130 immediately after the bone graft procedure, and dental crown 136 can be attached directly to dental implant 138 after implant 138 has been exposed

It will be appreciated by persons skilled in the art that the disclosed technique is not limited to what has been particularly shown and described hereinabove.

CLAIMS

1. A dental patch, operational for temporarily covering a tooth socket of a patient, wherein said dental patch is adapted to be positioned over said tooth socket immediately after bone grafting of said tooth socket following a tooth extraction, attached to the gums adjacent to said tooth socket, maintained over said tooth socket until formation of a thin gum tissue layer between said dental patch and the bone graft material, and removed from said tooth socket, allowing a dental implant procedure to be performed at said tooth socket after sufficient calcification of said bone graft material.

2. The dental patch of claim 1, wherein said dental patch is made from a biocompatible material selected from the list consisting of:

silicone; and

titanium foil.

3. The dental patch of claim 1, further enforced with a metallic structure.

4. The dental patch of claim 3, wherein said metallic structure is selected from the list consisting of:

a wire structure;

a net structure; and

a grid structure.

5. The dental patch of claim 1, wherein said dental patch is adapted to be cut by a dental practitioner from a prefabricated sheet in a shape and size suitable to the particular dimensions of said tooth socket.

5

6. The dental patch of claim 1, wherein the thickness of said dental is approximately 0.1-0.9mm.

10

7. The dental patch of claim 6, wherein the thickness of said dental is approximately 0.4-0.7mm.

8. A method for temporarily covering a tooth socket of a patient who has undergone a bone graft following a tooth extraction, said method comprising the procedures of:

15

positioning a dental patch over said tooth socket immediately after said bone graft;

attaching said dental patch to the gums adjacent to said tooth socket;

20

maintaining said dental patch over said tooth socket until formation of a thin gum tissue layer between said dental patch and the bone graft material; and

removing said dental patch, allowing a dental implant procedure to be performed at said tooth socket after sufficient calcification of said bone graft material.

- 5 9. The method of claim 8, further comprising the procedure of applying a sterilization material onto the bone graft material in said tooth socket before said procedure of positioning.
- 10 10. The method of claim 8, wherein said procedure of attaching said dental patch comprises suturing said dental patch at the periphery thereof to said gums.
11. The method of claim 8, wherein said dental patch is made from a biocompatible material selected from the list consisting of:
- 15 silicone; and
- titanium foil.
12. The method of claim 8, wherein said dental patch is enforced with a metallic structure.
- 20 13. The method of claim 12, wherein said metallic structure is selected from the list consisting of:
- a wire structure;

a net structure; and

a grid structure.

14. The method of claim 8, further comprising the procedure of cutting
5 said dental patch by a dental practitioner from a prefabricated sheet
in a shape and size suitable to the particular dimensions of said tooth
socket.

15. The method of claim 8, wherein a dental implant is inserted into said
10 tooth socket filled with said bone graft prior to being covered by said
dental patch.

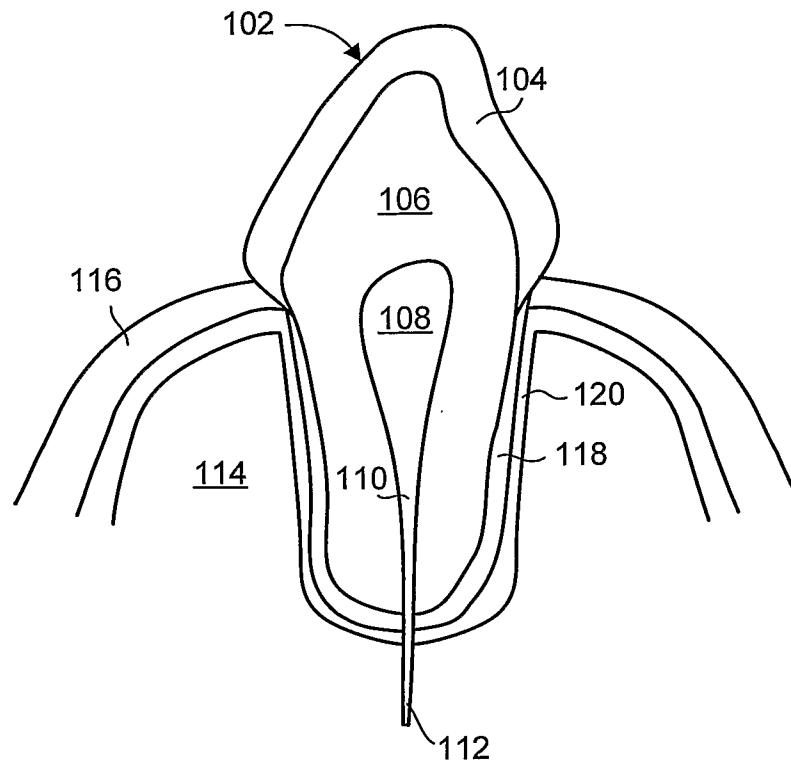
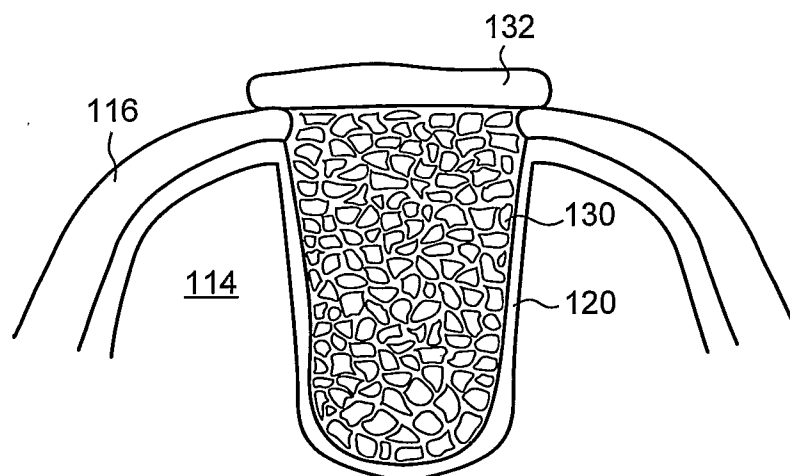
16. A method for performing a tooth replacement on a patient, said
method comprising the procedures of:

15 extracting a tooth from a tooth socket of said patient;
performing a bone graft in said tooth socket;
temporarily covering said tooth socket filled with bone graft
material, by:

positioning a dental patch over said tooth socket
20 immediately after said bone graft;
attaching said dental patch to the gums adjacent to said
tooth socket;

maintaining the dental patch over the tooth socket until the
formation of a thin gum tissue layer between said dental patch
and said bone graft material; and
removing said dental patch;
5 and
performing a dental implant procedure at said tooth socket after
sufficient calcification of said bone graft material.

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**FIG. 1****FIG. 2**

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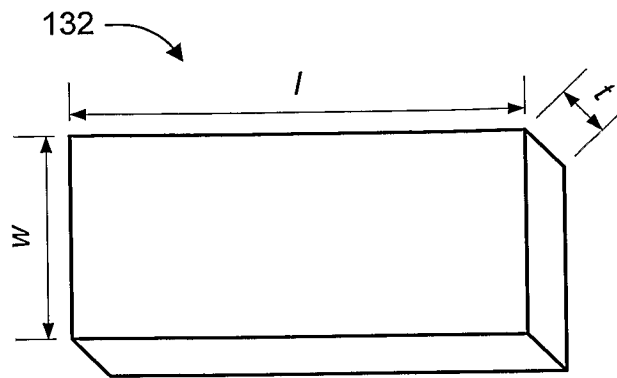


FIG. 3

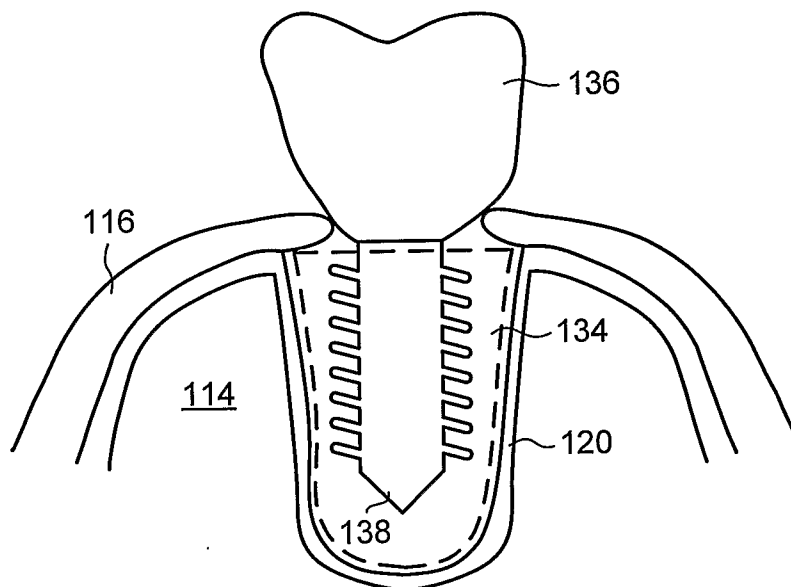


FIG. 4

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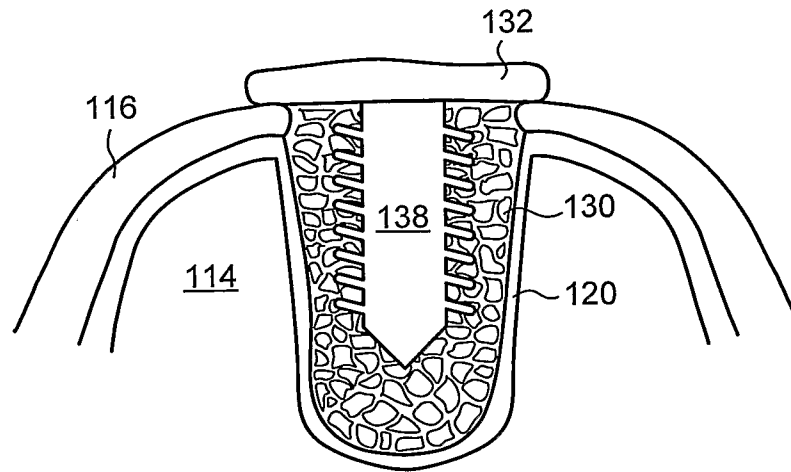


FIG. 5

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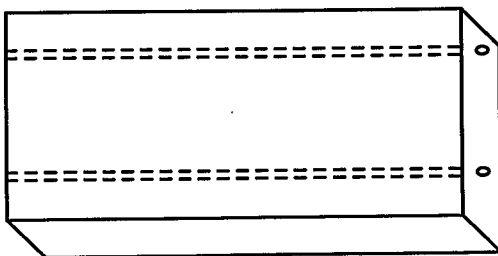


FIG. 6A

144

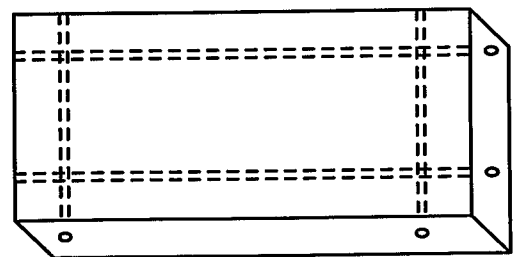


FIG. 6B

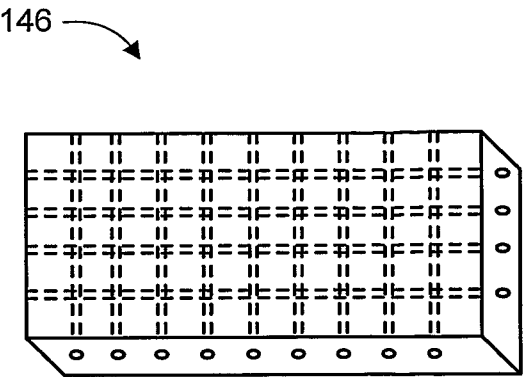


FIG. 6C

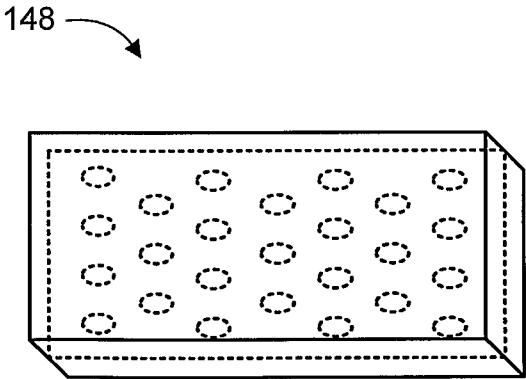


FIG. 6D

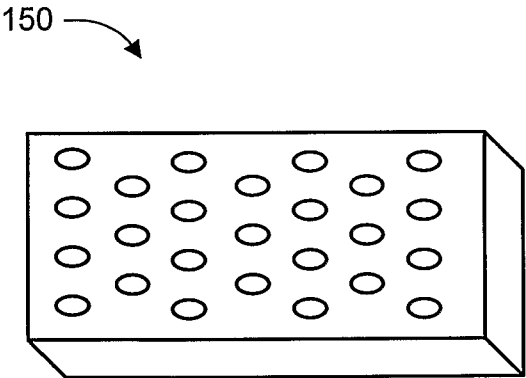


FIG. 6E

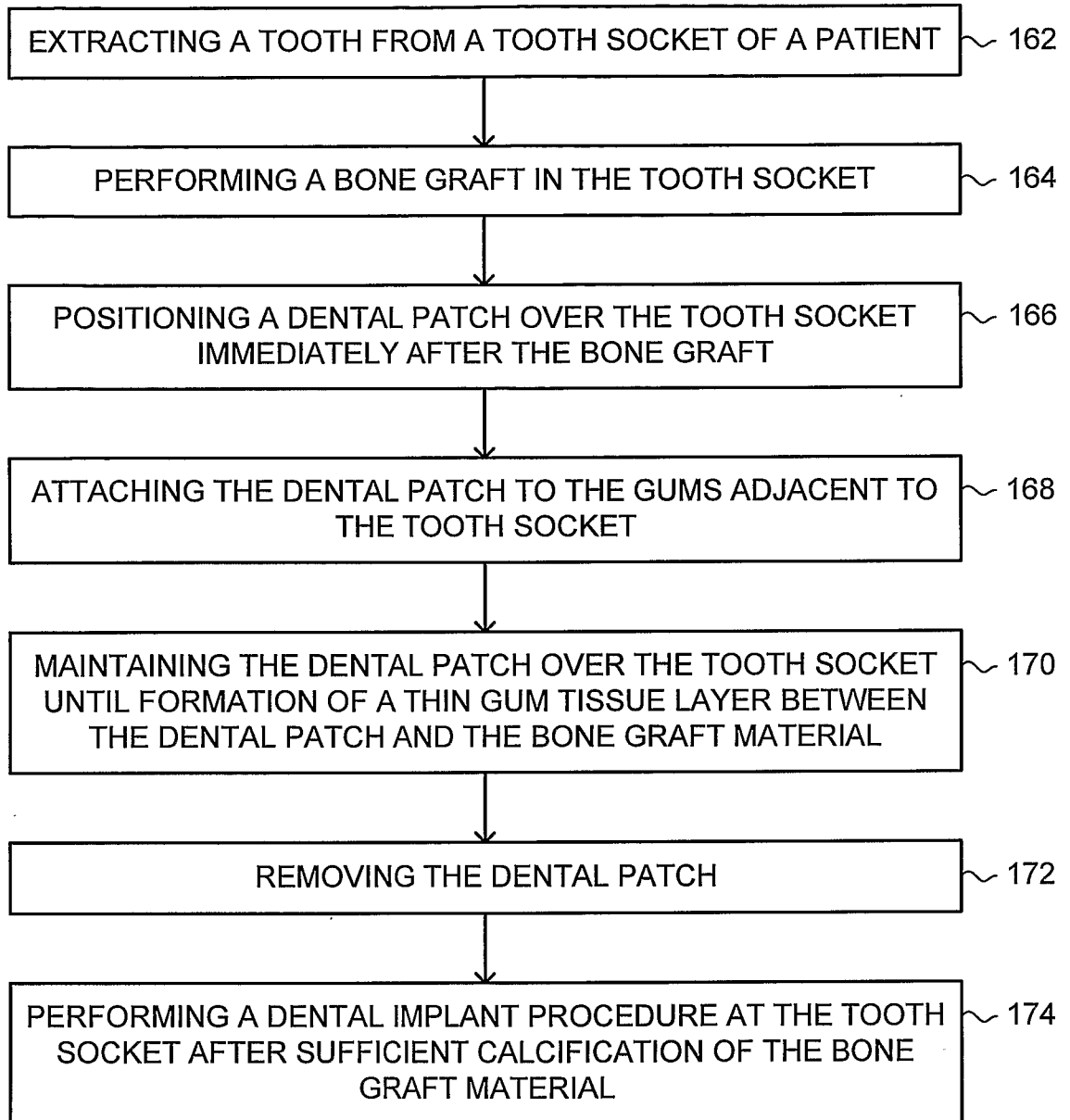


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No

PCT/IL2009/000293

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61C8/00

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 032 445 A (SCANTLEBURY TODD V [US] ET AL) 16 July 1991 (1991-07-16) column 8, lines 26-40; figures column 10, lines 5-17 column 16, lines 14-17 claims 2,12,27,40,50,69,74; example 7 -----	1-7
X	WO 00/32749 A (GORE ENTERPRISE HOLDINGS INC [US]) 8 June 2000 (2000-06-08) claims 6,11,12; figures -----	1-7
X	US 2001/012607 A1 (ROBINSON DANE O [US]) 9 August 2001 (2001-08-09) cited in the application the whole document -----	1-7



Further documents are listed in the continuation of Box C.



See patent family annex.

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 8-16

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery/therapy

Continuation of Box II.2

Claims Nos.: -

The claims 1 and 5 were searched in the view of the description only because these claims only define the invention by functional features and/or the result to be achieved instead of by clear technical features of the dental patch, contrary to the clarity requirement of Art. 6 PCT

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2)PCT declaration be overcome.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2009/000293

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.: 8-16
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery/therapy
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:
see FURTHER INFORMATION sheet PCT/ISA/210
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:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable 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 reportcovers 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.:

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IL2009/000293

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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WO 0032749	A	08-06-2000	AU 1749700 A	19-06-2000
			CA 2353524 A1	08-06-2000
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