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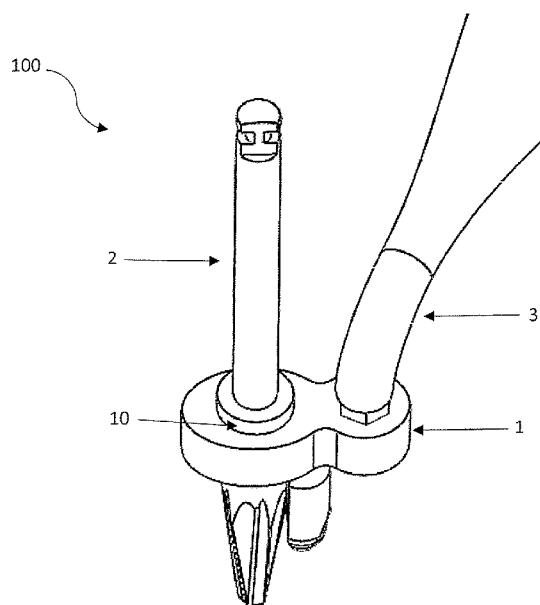


Figure 1

(57) Abstract: A two-stage surgical protocol is used for the placement of a dental implant. Usually, the first stage is the extraction of the tooth. Several months are required to allow new bone growth to heal the extracted socket. The second stage is when a hole is drilled into the bone and the implant is screwed in. The entire procedure is time consuming, expensive, requires extensive technical skill, and is carried out over several visits to the dentist causing additional distress to the patient. To alleviate one or more of these problems, a device for the immediate placement of an implant fixture into a newly extracted tooth socket is described. The device comprises a guide with a recess and a post. The post is adapted to engage a patient's jaw to position the guide relative to the patient's tooth socket to align the recess over the tooth socket. A reshaper comprising a cutting tip is rotationally received in the recess to position the reshaper relative to the tooth socket. The reshaper is rotated to cut and reshape the tooth socket to receive an implant fixture.

## **A DEVICE AND METHOD FOR PLACING AN IMPLANT IN A TOOTH SOCKET**

The present invention relates generally to the field of dentistry and more specifically to a device or system for placing a dental implant in the tooth socket immediately after tooth extraction.

### **5 BACKGROUND TO THE INVENTION**

The field of prosthodontics deals with the replacement, rehabilitation and, maintenance of the oral function, comfort, appearance and, health of patients with clinical conditions associated with missing or deficient teeth. To replace a natural tooth, a dentist uses a variety of devices of which implant, abutment, and crown  
10 are significant.

The majority of implants used today are made of titanium and are available in various sizes and shapes. A two-stage surgical protocol is used for the placement of a dental implant. Usually, the first stage is the extraction of the tooth. Several  
15 months are required to allow new bone growth to heal the extracted socket. The second stage is when a hole is drilled into the bone and the implant is screwed in. The entire procedure is time consuming, expensive, requires extensive technical skill, and is carried out over several visits to the dentist causing additional distress to the patient.

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It is also possible to place an immediate dental implant directly into an extraction socket, but this requires drilling deeper into the base of the socket to obtain sufficient stability. Many general dentists refuse to carry out this procedure due to the perceived high risk of damaging adjacent nerves and/or nasal sinuses. Once the  
25 implant has osseointegrated into the bone, a permanent crown is placed.

The above surgical implant procedure requires a level of skill and confidence that is beyond many general dentists. Primarily, many general dentists are anxious about drilling into bone and prefer to refer such patients to specialists. They are also  
30 concerned about the high cost of the surgical equipment required of relatively infrequent procedures.

In this specification where reference has been made to patent specifications, other external documents, or other sources of information, this is generally for the  
35 purpose of providing a context for discussing the features of the invention. Unless

specifically stated otherwise, reference to such external documents is not to be construed as an admission that such documents, or such sources of information, in any jurisdiction, are prior art, or form part of the common general knowledge in the art.

## 5 SUMMARY OF THE INVENTION

It is an object of the present invention to provide a device which goes at least some way towards overcoming one or more of the above mentioned problems or difficulties, or to provide the dental industry with a useful choice.

In some embodiments, the present invention consists in a device or method for  
10 reshaping a tooth socket for the placement of a dental implant that can be fitted in a patient's tooth socket immediately after tooth extraction. In some embodiments, the device is adapted to reshape the tooth socket mesial-distally and not disturb the usually frail buccal and/or lingual plates. In some embodiments the device provides circumferential/radial and vertical limit for a reshaping tool for reshaping  
15 the tooth socket. In some embodiments, the device enables placement of a dental implant without having to drill into the patient's jaw bone apically beyond the tooth socket.

In one aspect, the present invention consists in a device for use in the immediate  
20 placement of an implant fixture into a newly extracted tooth socket comprising:  
a guide comprising a post adapted to engage in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket; and  
a tool adapted to cut or otherwise remove tissue from the tooth socket, wherein the guide is adapted to support and position the tool within the  
25 tooth socket to reshape the tooth socket to receive an implant fixture, and wherein the post is adapted to rest on the buccal side or the lingual side of the tooth socket, within the tooth socket, or  
the post is a blade-like or spear-like post adapted to be inserted between the patient's gingivae and the patient's palatal bone, or  
30 the post is adapted to rest against the labial or palatal gingivae.

In some embodiments the guide supports the tool for movement relative to the guide and tooth socket to be operated to cut or otherwise remove tissue from the tooth socket.

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In some embodiments the guide rotationally supports the tool.

In some embodiments the tool is a cutting tool, with a cutting tip.

- 5 In some embodiments, the guide and tool are complementarily adapted to position the tool vertically and radially within the tooth socket.

In some embodiments, the guide comprises a recess, the post adapted to engage in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket and align the recess over the tooth socket, and  
10 wherein the recess is adapted to receive the tool to position the tool within the tooth socket.

In some embodiments, the device comprises a handle adapted to be attached to  
15 the guide. The handle may comprise a socket or recess to receive the guide, or the guide may comprise a socket or recess to receive the handle.

In some embodiments, the post presents a flat lateral facing area to rest against the palatal gingivae.  
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In some embodiments, the guide comprises more than one said post, or two said posts.

In some embodiments, the tool comprises a stop to define a vertical limit relative to  
25 the guide.

In some embodiments, the recess positions the tool radially relative to the guide.

In some embodiments, the recess is a cylindrical hole with an inner circumference  
30 to bear against an outer circumference of the tool to position the tool radially relative to the guide.

In some embodiments, the device comprises an implant fixture to be implanted into the tooth socket after reshaping by the tool.  
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In some embodiments, the implant fixture has a horizontal fin or fins.

In some embodiments, the implant fixture has at least one helical fin.

In some embodiments, an outer most diameter of the fixture is larger than the diameter of the reshaped tooth socket.

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In another aspect, the present invention consists in a guide for use in the immediate placement of an implant fixture into a newly extracted tooth socket comprising:

a post adapted to engage in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket, and

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wherein the guide is adapted to support and position a tool adapted to cut or otherwise remove tissue from the tooth socket within the tooth socket to reshape the tooth socket to receive an implant fixture, and wherein

the post is adapted to rest on the buccal side or the lingual side of the tooth socket, within the tooth socket, or

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the post is a blade-like or spear-like post adapted to be inserted between the patient's gingivae and the patient's palatal bone, or

the post is adapted to rest against the labial or palatal gingivae.

In some embodiments, the guide is adapted to position the tool vertically and radially within the tooth socket.

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In some embodiments, the guide comprises a recess, the post adapted to engage in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket and align the recess over the tooth socket, and

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wherein the recess is adapted to receive the tool to position the tool within the tooth socket

In some embodiments, the guide comprises an interface to releasably engage a handle to be fixed to the guide.

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In some embodiments, the post presents a flat lateral facing area to rest against the palatal gingivae.

In some embodiments, the guide comprises more than one said post, or two said posts.

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In another aspect, the present invention consists in a method for the immediate placement of an implant into a newly extracted tooth socket comprising:

providing a guide comprising a post, and engaging the post in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket;

5 providing a tool adapted to cut or otherwise remove tissue from the tooth socket;

using the guide to support and position the tool within the tooth socket, operating the tool to reshape the tooth socket to create a premeditated void;

10 removing the tool from the patient or the tool and the guide from the patient;

providing an implant fixture into the void created by the tool.

In some embodiments, the method comprises providing a handle and engaging the handle with the guide to rotationally fix the handle to the guide and holding the handle to position the guide with the post engaging in or adjacent to the patient's tooth socket.

In some embodiments, the method comprises placing the post against the buccal side or the lingual side of the tooth socket within the tool socket.

In some embodiments, the post is a blade or spear-like post and the method comprises inserting the post between the patient's gingivae and the patient's palatal bone.

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In some embodiments, the method comprises placing the post against the palatal gingivae so as to align the reshaper parallel to the palatal bone to reshape the socket so that an implant fixture is to be aligned away from the frail labial side.

The term "comprising" as used in this specification and claims means "consisting at least in part of". When interpreting each statement in this specification and claims that includes the term "comprising", features other than that or those prefaced by the term may also be present. Related terms such as "comprise" and "comprises" are to be interpreted in the same manner.

30 As used herein the term "and/or" means "and" or "or", or both.

As used herein "(s)" following a noun means the plural and/or singular forms of the noun.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in  
5 the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

The invention consists in the foregoing and also envisages constructions of which the following gives examples only.

## 10 **BRIEF DESCRIPTION OF THE DRAWINGS**

Preferred embodiments of the invention will be described by way of example only and with reference to the drawings, in which:

**Figure 1** is a top perspective view of a device for reshaping a tooth socket in preparation for the installation of a dental implant immediately after tooth  
15 extraction.

**Figure 2** is a bottom perspective view of a guide of the device of figure 1

**Figure 3** is a side perspective view of a reshaping tool of the device of figure 1.

**Figure 4** is a top perspective view of the device of figure 1 placed in a tooth socket.

20 **Figure 5** is a top perspective view of an implant fixture to be implanted in a tooth socket after being reshaped by the device of figure 1 immediately after tooth extraction.

**Figure 6** is a top perspective view of an alternative guide and a handle to be used together with the reshaping tool of figure 4 in a device for reshaping a tooth socket  
25 in preparation for the installation of a dental implant immediately after tooth extraction.

**Figure 7** is a top perspective view of the guide and handle of figure 6 placed over an anterior tooth socket.

**Figure 8** is the side perspective view of another embodiment of a guide for use in a device for reshaping a tooth socket in preparation for the installation of a dental implant immediately after tooth extraction.

5 **Figure 9** is a perspective view of an alternative guide for use in a device for reshaping a tooth socket.

**Figure 10** is a bottom perspective view of an alternative guide for use in a device for reshaping a tooth socket with the guide inverted in an up-side-down orientation.

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#### **DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS**

Various embodiments are described with reference to the Figures. Throughout the Figures and specification, the same reference numerals may be used to designate the same or similar components, and redundant descriptions thereof may be omitted.

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A device or implant kit to be used in a tooth socket immediately after extraction of the tooth from the tooth socket is described with reference to Figures 1 to 5. The device 100 comprises a guide 1, a reshaping tool or reshaper 2, a handle 3, and implant fixture 15. In the illustrated embodiment, the guide 1 has a first recess 4 and a second recess 5 that receive the handle and the reshaper. The reshaper may be described as a cutting tool comprising a cutting bit. In some embodiments, the reshaper is rotated to reshape the tooth socket by cutting tissue from the tooth socket. In some embodiments, the reshaper may be a tool that cuts tissue from the tooth socket to reshape the tooth socket by rotational and/or other motion, for example reciprocating or oscillating motion, linear broaching, or piezo-electric vibrations. In some embodiments, the reshaper may be a device or tool that comprises a laser to remove tissue from the tooth socket. Once the tooth socket has been reshaped the guide, handle and reshaper are removed from the tooth socket, and the implant fixture 15 is fitted into the reshaped tooth socket. The parts of the device are made of one or more biocompatible materials such as metal, ceramic, and/or plastic.

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In the embodiment of figures 1 to 5 the guide 1 comprises the first recess 4, the second recess 5, and a post 6. The first recess or socket allows for the handle to be attached to the guide. The handle locks into the first recess via mechanical locking,

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or in other words once received in the first recess the handle cannot rotate relative to the guide. In the illustrated embodiment, the first recess and the handle have a hexagonal interface. The hexagonal interface allows for the handle to be fixed to the guide in any one of six positions for flexibility in positioning the device within a patient's mouth. Other interfaces between the handle and guide are possible, for example a square interface. In an alternative embodiment, the guide 1 may comprise a post and the handle may comprise a corresponding recess or socket to receive the post of the guide. In some embodiments, the guide may comprise more than one handle interface, so that the handle 3 may be attached to the guide in more than one location. For example, as shown in Figure 9, the guide 41 may comprise two recesses 4, each adapted to receive a corresponding post or bit of the handle. Providing more than one interface 4 for attaching the handle provides flexibility in positioning the handle to the guide for accessing difficult to access tooth sockets, for example posterior tooth sockets. The handle may be provided to either handle interface 4 on the guide.

The second recess 5 is adapted to receive the reshaper. Unlike the handle recess 4, the second recess 5 rotationally receives the reshaper to allow the reshaper to rotate within the second recess. Preferably the recess is a cylindrical aperture or hole through the guide. An outer circumference of the reshaper bears against an inner circumference of the second recess so that the radial position (or rotational axis) of the reshaper is fixed relative to the guide. The rotational axis of the reshaper is mechanically aligned with the central axis of the second recess upon entry. The second recess is of a sufficient length to ensure the axis of the reshaper is true. Other interfaces between the reshaper and the guide are possible, for example where an oscillatory reshaping tool is desired, the guide may comprise a recess to accept the reshaper or a post or other protrusion received by the reshaper that allows for vertical oscillations of the reshaper relative to the guide and the tooth socket. Where a laser tool reshaper device is desired, the reshaper may be held against movement by the guide. In all embodiments, the guide positions the reshaper for correct alignment to the tooth socket for reshaping.

The post 6 of the guide 1 acts as a positional reference point that aims to locate the second recess (the reshaper interface) and therefore the reshaper at a pre-set distance from the patient's buccal wall and approximately in the centre of the tooth socket. The post 6 comprises at least one surface, e.g. first surface 7, adapted to rest on the buccal or lingual side of the tooth socket within the tooth socket, at or

adjacent the rim or the coronal end of the tooth socket. The post 6 does not extend to the apical end of the tooth socket, so that the guide post 6 remains substantially clear of at least the apical end of the socket to provide room for the reshaper to enter and reshape the socket by removing tissue from the inner surfaces of the tooth socket. In some embodiments, a surface 7 of the post is bevelled to rest on the buccal or lingual side of the tooth socket, within the tooth socket. Another surface e.g. second surface 8 of the post is parallel to a shaft portion or a non-cutting portion of the reshaper to accommodate or allow for the ease of rotation of the reshaper. In some embodiments, the guide may comprise more than one post, for example two posts 6 as shown by the example embodiment 51 of Figure 10. Like the embodiment of Figure 2, the posts engage an inner side of the tooth socket, for example the buccal or lingual side of the tooth socket at or adjacent the rim or coronal end of the tooth socket. Providing more than one post may assist in stabilising the guide to support the reshaper tool 2 in a correct alignment within the tool socket.

In some embodiments, the guide may be used without a handle 3, and may be without a handle interface 4. In some embodiments, the guide may be held in place by securing to adjacent teeth using dental restorative material such as dental composite. In some embodiments, the guide may include features to help bind composited to the guide to secure the guide to adjacent teeth. For example, with reference to the guide 51 shown in Figure 10, the guide may comprise one or more cavities 18 to receive composite to help bind the composite to the guide. Other binding features may be provided, for example striations, ridges or grooves or surface texture.

In the illustrated embodiment and as best shown in Figure 3, the reshaper 2 comprises a handle portion 9, a stopper 10, a non-cutting portion 11, and a cutting portion 12.

The non-cutting portion 11 allows for the reshaper to be rotated within the second recess 5 of the guide 1. This portion 11 also prevents the reshaper from cutting or damaging the tooth socket above the bone level (thereby allowing the tooth socket to heal faster). The cutting portion 12 allows for the reshaping of the tooth socket in a controlled manner. The cutting portion 12 is limited in its ability to reshape the socket due to the stopper 10 and the diameter of the second recess. The stopper 10 has a larger diameter than the diameter of the second recess and the diameter

of the cutting portion 12 and non-cutting portion below the stopper, to provide a bearing surface that bears against an upper surface of the guide. The stopper and upper surface of the guide thus define a vertical limit for the reshaper and the inner circumference of the second recess and the outer circumference of the non-cutting portion provides the radial positioning of the reshaper. With the post positioned against the buccal or lingual side of the tooth socket, the guide 1 thus positions the reshaper vertically and axially relative to the tooth socket. The reshaper reshapes the tooth socket to desired dimensions set by the guide corresponding with the dimensions of the dental implant fixture 15 to be placed in the socket.

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The implant fixture, in the illustrated embodiment shown in Figure 5, comprises a coronal end 13, an apical end 14, and a body 15. The coronal end 13 has a recess to receive an abutment. The body 15 of the implant has a thread or threads 16 that extend into a horizontal fin or fins 17. The fin or fins 17 have a cutting edge that allows them to wedge into the bony tissue of the tooth socket. It is not necessary to drill apically beyond the tooth socket; the implant fixture is placed (e.g. threaded or screwed in) in the tooth socket so that the fin or fins wedge into the bony tissue around the tooth socket. The thread facilitates the fitting of the implant into the tooth socket. The thread or threads are thinner and extend farther in the radial direction than typical prior art implants, which facilitates placement and provides additional stability in an immediate placement surgical protocol. In the illustrated embodiment the implant fixture comprises a single helical thread 16. The thread tapers at an outer circumference into a narrow circumferential edge or fin 17 to provide a single helical fin 17. More than one helical thread and fin may be provided.

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The outermost diameter of the implant fixture (e.g. the outer diameter of the fins) is larger than the diameter of the reshaped tooth socket created by the reshaper. This allows for the fins 17 of the implant to wedge and/or cut into the bony tissue surrounding the tooth socket and provide initial stability. In the illustrated embodiment the diameter of the implant fixture tapers from the coronal end to the apical end. An outer diameter of the body 15 from which the thread and fin extends may taper from the coronal end to the apical end.

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35 The device is used as follows.

1. The dentist extracts the native tooth without damaging the tooth socket.

2. The guide 1, without the reshaper, is placed over the newly extracted tooth socket such that the post 6 on the guide 1 is placed against the buccal side of the tooth socket. The post on the guide may be placed against the lingual side of the tooth socket if the bone on the lingual side is thinner than the bone on the buccal side.
3. The reshaper 2 is inserted through the second recess 5 on the guide 1 while the handle 3 is used to hold the device 1 over the tooth socket as shown in Figure 4. Alternatively, the guide may be secured to the adjacent teeth using dental restorative material such as dental composite.
4. The reshaper is rotated either by hand or using a torque wrench or motorized dental hand-piece or similar, or is otherwise moved or operated to cut tissue from the tooth socket, e.g. by vibration or reciprocation. The cutting edges or cutting portion 12 on the reshaper cut away any excess septum bone. The stopper 10 on the reshaper restricts the depth of the void the reshaper can produce.
5. Once the reshaper, guide and handle are removed, the tooth socket has a reshaped void in its centre, away from the buccal (and lingual) plate(s).
6. The implant fixture, is fixed into the void created by the reshaper. The dentist ensures that the horizontal fins 17 on the implant are buried in the bone tissue surrounding the void and the platform or upper end (the coronal end) of the implant fixture is at the desired vertical depth.
7. The dentist places a healing abutment onto the coronal end of the implant. The dentist may suture the socket to approximate the surrounding tissues.

The implant site is allowed to heal and the dentist reviews the site on a regular basis. The dentist places a dental prosthesis into the recess at the coronal end of the implant fixture once the implant site heals.

The embodiment described above comprises a guide that is particularly adapted for use in posterior teeth. A further embodiment is now described with reference to Figures 6 and 7 that is particularly adapted for use in anterior teeth.

In the embodiment illustrated in Figures 6 and 7, the guide 21 comprises a first recess 4 and a second recess 5 as described in the earlier embodiment. The guide 21 comprises a blade-like or spear-like post 26. The blade-like post 26 is adapted to be inserted between the gingivae and the labial or palatal bone. The blade-like post acts as a positional reference point that aims to locate the cylindrical guide

hole 5 such that when the reshaper is inserted, the reshaper is parallel to the desired axis of the proposed implant, as shown in Figure 7. This ensures that the reshaper modifies the shape of the tooth socket appropriate to the desired axis of the implant fixture 15. Also, the blade like post 26 remains substantially clear of the socket, which provides room for the reshaper to enter and reshape the socket by removing tissue from the inner surfaces of the tooth socket. In some embodiments the guide 21 may comprise more than one post 26, for example two posts 26.

10 As the labial side of anterior tooth sockets are thin and frail, placing the implant fixture parallel to the palatal bone allows for better stability of the implant. It also prevents the implant from being seen through the gingivae. Furthermore, ideal implant axis is parallel to the palatal bone due to the available bone volume in this area and the favourable clinical implications due to the anatomy of the region.

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In yet another embodiment as illustrated in Figure 8, a guide 31 comprises a first recess 4 to accept a handle and a (cylindrical) guide hole 5 to guide the reshaper 2 as described in the earlier embodiments, and a flat-ended or flat sided post 36. The flat-ended post is rested on the labial or palatal gingivae to achieve the correct position and angle of the second recess 5. The post 36 is not inserted between the gingivae and the bone like the blade-like post 26 and is not inserted into the tooth socket like the post 6 of the first described embodiment. The flat end of the post 36 provides a lateral facing area 37 to bear against the labial or palatal gingivae. As the flat sided post 36 remains outside of the socket, the guide provides room for the reshaper to enter and reshape the socket by removing tissue from the inner surfaces of the tooth socket. In some embodiments the guide 31 may comprise more than one post 36, for example two posts 36. The posts may act against the labial gingivae or the palatal gingivae.

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30 Although the embodiments of figures 6 to 8 are adapted for use in anterior teeth, these embodiments may also be used in posterior teeth. All references to palatal bone refer to the bone surface outside the tooth socket and not the palatal wall of the socket interior. The terms "second recess" and "cylindrical guide hole" 5 are used interchangeably.

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The device 100 comprising the guide 21 or 31 of the second and third embodiments is used as follows.

1. The dentist extracts the native tooth without damaging the tooth socket.
2. The guide 21, without the reshaper, is placed over the newly extracted tooth socket. It is placed such that the blade-like post 26 is inserted between the patient's gingivae and the palatal bone. This ensures that the second recess 5 is aligned (or angled) so that the reshaper may be inserted parallel to the palatal bone.

When the guide 36 comprising the flat-ended post 36 is used, the guide is positioned such that the flat-ended post rests against the palatal gingivae so as to align the second recess 5 such that the reshaper may be inserted parallel to the palatal bone.

3. The reshaper is inserted through the second recess on the guide while the handle is used to hold the guide over the tooth socket. Alternatively, the guide may be secured to the adjacent teeth using dental restorative material such as dental composite. This will increase the work space around the tooth socket as there will be no requirement for use of the handle. Additionally, the guide will be in a fixed, rigid position and the procedure can then be performed one-handed.
4. The reshaper is rotated or otherwise operated either by hand or using a suitable tool, e.g. in the case of a rotational cutting tool a torque wrench or motorized dental hand-piece or similar. The stop 10 on the reshaper restricts the depth of the void the reshaper can produce.
5. Once the reshaper, guide and handle are removed, the tooth socket has been reshaped appropriately to receive an implant fixture.
6. The implant fixture 15 is fixed into the reshaped socket created by the reshaper. The dentist ensures that the horizontal fins 17 on the implant fixture are buried in the bone tissue surrounding the reshaped socket and the platform or upper end (the coronal end) of the implant fixture is at the desired vertical depth.
7. The dentist places a healing abutment onto the coronal end of the implant. The dentist may suture the socket to approximate the surrounding tissues.
8. The implant site is allowed to heal and the dentist reviews the site on a regular basis. A dental prosthesis is placed into the recess at the coronal end of the implant fixture once the implant site heals.

In some embodiments, a system comprising a range of guides and/or reshapers and implant fixtures to accommodate for various sized tooth sockets. For example

a dimension between the post 6, 26, 36 and the axis of the second recess 5 may vary between different sized guides, and/or the diameter of the second recess may be varied between guides. A vertical position of the stop 10 relative to the cutting tip 12 and/or the diameter or form of the cutting tip 12 may vary between different reshapers.

In some embodiments the present invention provides a device (e.g. a guide or guide and reshaper, or guide, reshaper and handle, or a guide, reshaper, handle and implant fixture) or method that allows general dentists to place an implant without having to drill into the patient's jaw bone apically beyond the tooth socket and without a large outlay for implant-placement related equipment. In some embodiments the present invention provides a device for reshaping a tooth socket in preparation for the installation of an immediately placed dental implant. In some embodiments the present invention minimizes the risks traditionally associated with socket preparation for immediately placed implants.

The foregoing description of the invention includes preferred forms thereof. Modifications may be made thereto without departing from the scope of the invention as defined by the accompanying claims.

**CLAIMS**

1. A device for use in the immediate placement of an implant fixture into a newly extracted tooth socket comprising:
  - a guide comprising a post adapted to engage in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket; and
  - wherein the guide is adapted to support and position a tool adapted to cut or otherwise remove tissue from the tooth socket within the tooth socket to reshape the tooth socket to receive an implant fixture, and wherein
    - the post is adapted to rest on the buccal side or the lingual side of the tooth socket, within the tooth socket, or
    - the post is a blade-like or spear-like post adapted to be inserted between the patient's gingivae and the patient's palatal bone, or
    - the post is adapted to rest against the labial or palatal gingivae.
2. The device as claimed in claim 1, wherein the guide is adapted to position the tool vertically and radially within the tooth socket.
3. The device of claim 1 or 2, wherein the guide comprises a recess, the post adapted to engage in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket and align the recess over the tooth socket, and
  - wherein the recess is adapted to receive the tool to position the tool within the tooth socket.
4. The device of any one of claims 1 to 3, comprising a handle adapted to be attached to the guide.
5. The device of claim 1, wherein the post presents a flat lateral facing area to rest against the palatal gingivae.
6. The device of any one of claims 1 to 5, wherein the guide comprises more than one said post, or two said posts.
7. The device of any one of claims 1 to 6, comprising the tool adapted to cut or otherwise remove tissue from the tooth socket.

8. The device of claim 7, wherein the tool comprises a stop to define a vertical limit relative to the guide.
9. The device of claim 3, wherein the recess positions the tool radially relative to the guide.
10. The device of claim 9, wherein the recess is a cylindrical hole with an inner circumference to bear against an outer circumference of the tool to position the tool radially relative to the guide.
11. The device of any one of claims 1 to 10, comprising an implant fixture to be implanted into the tooth socket after reshaping by the tool.
12. The device of claim 11, wherein the implant fixture has a horizontal fin or fins.
13. The device of claim 11 or 12, wherein the implant fixture has at least one helical fin.
14. The device of any one of claims 11 to 13, wherein an outer most diameter of the fixture is larger than the diameter of the reshaped tooth socket.
15. A method for the immediate placement of an implant into a newly extracted tooth socket comprising:
  - providing a guide comprising a post, and engaging the post in or adjacent to a patient's tooth socket to position the guide relative to the tooth socket;
  - providing a tool adapted to cut or otherwise remove tissue from the tooth socket;
  - using the guide to support and position the tool within the tooth socket, operating the tool to reshape the tooth socket to create a premeditated void;
  - removing the tool from the patient or the tool and the guide from the patient;
  - providing an implant fixture into the void created by the tool.
16. The method of claim 15, comprising providing a handle and engaging the handle with the guide to rotationally fix the handle to the guide and holding the

handle to position the guide with the post engaging in or adjacent to the patient's tooth socket.

17. The method of claim 15 or 16, wherein the method comprises placing the post against the buccal side or the lingual side of the tooth socket within the tool socket.

18. The method of claim 15 or 16, wherein the post is a blade or spear-like post and the method comprises inserting the post between the patient's gingivae and the patient's palatal bone.

19. The method of claim 15 or 16, wherein the method comprises placing the post against the palatal gingivae so as to align the tool parallel to the palatal bone to reshape the socket so that an implant fixture is to be aligned away from the frail labial side.

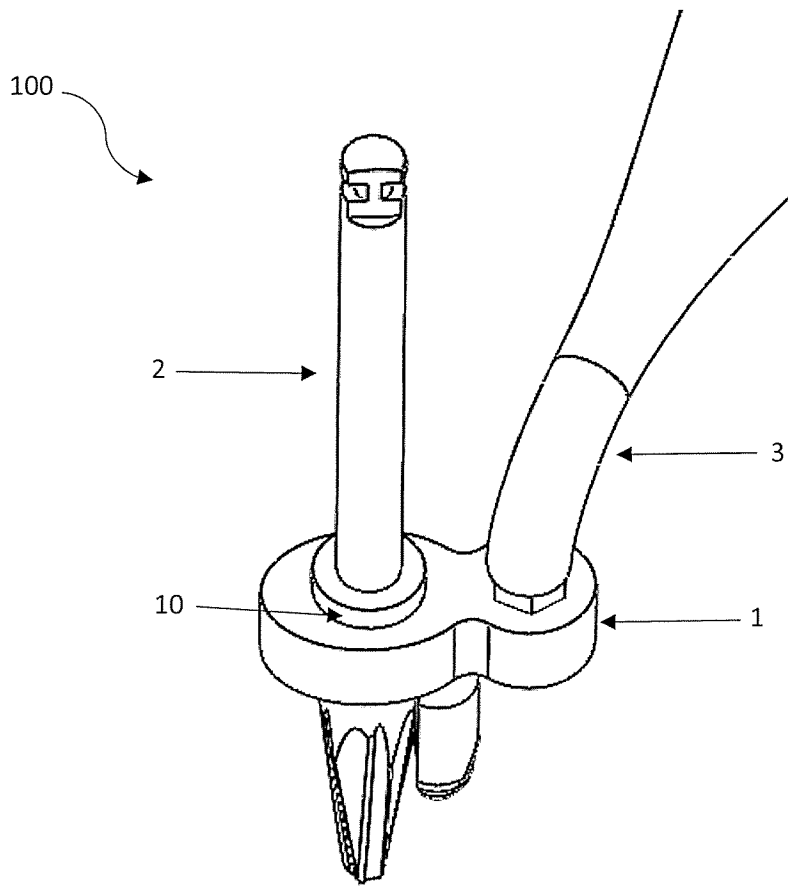


Figure 1

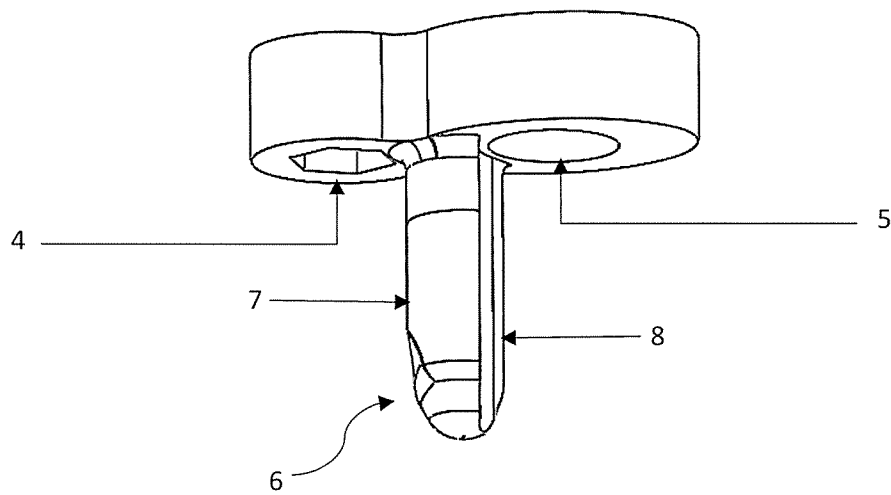


Figure 2

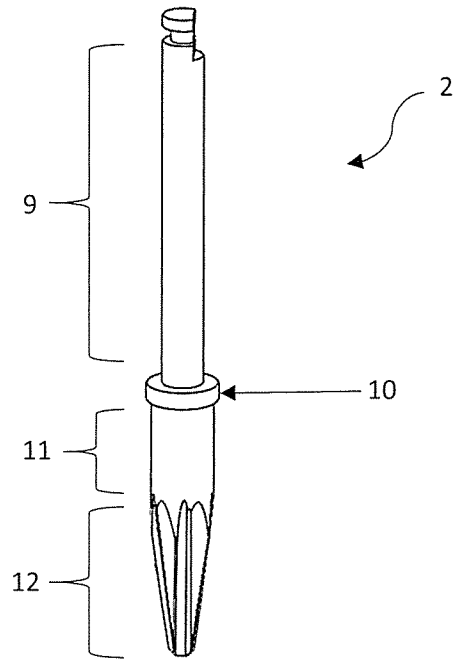


Figure 3

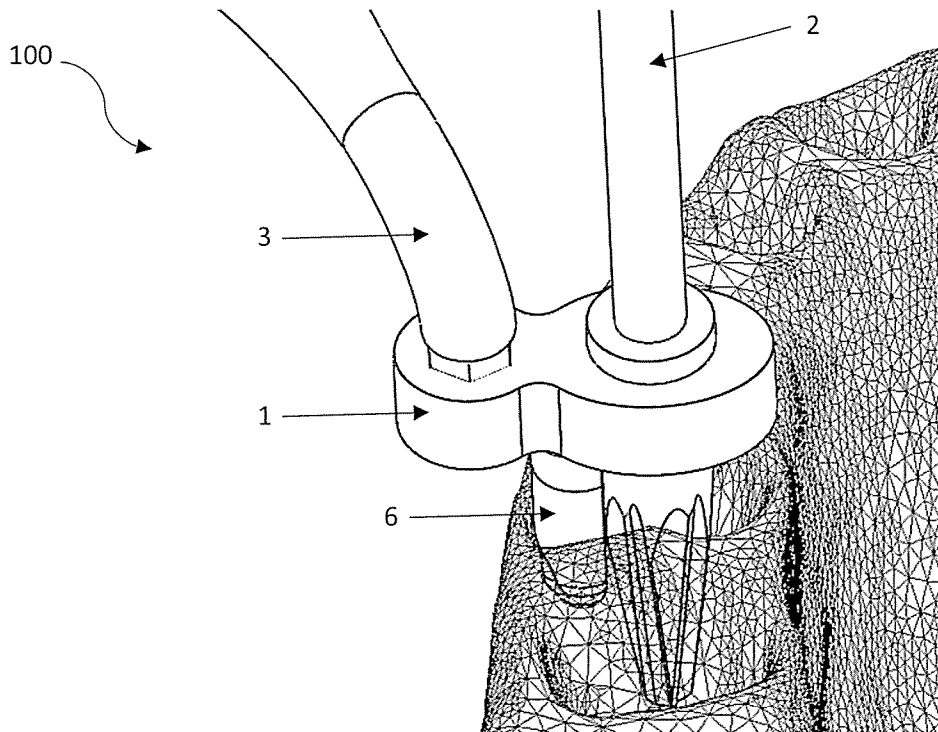


Figure 4

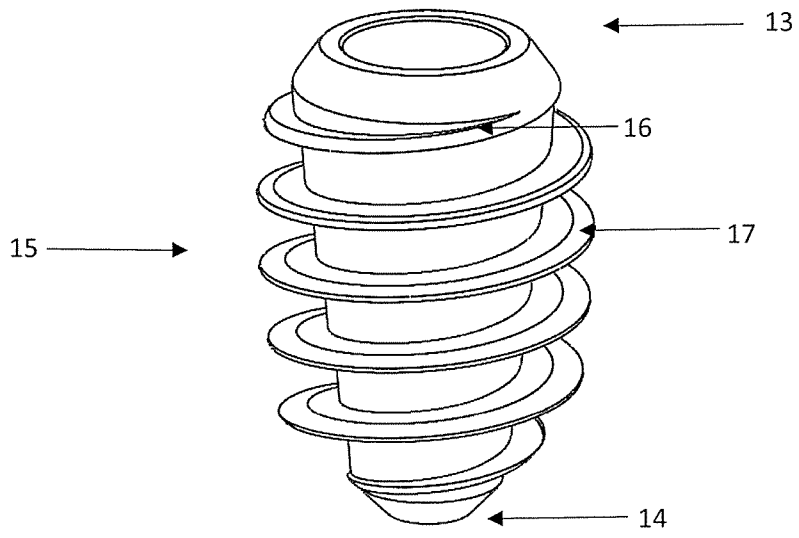


Figure 5

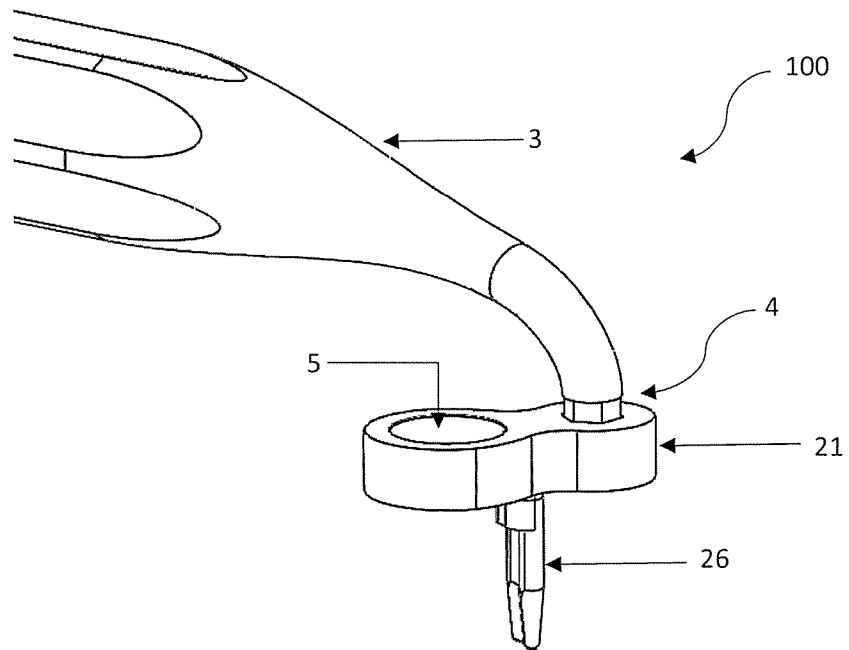


Figure 6

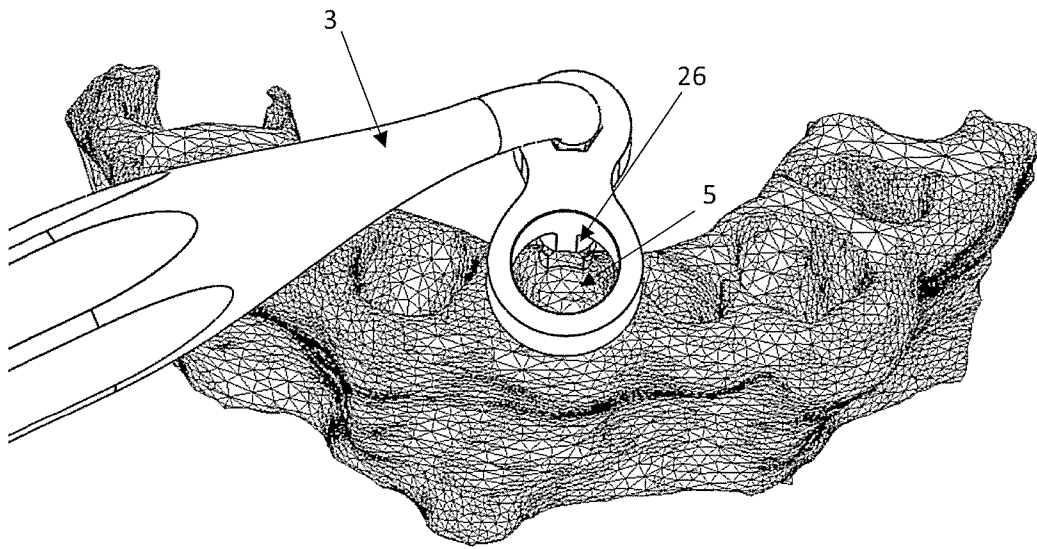


Figure 7

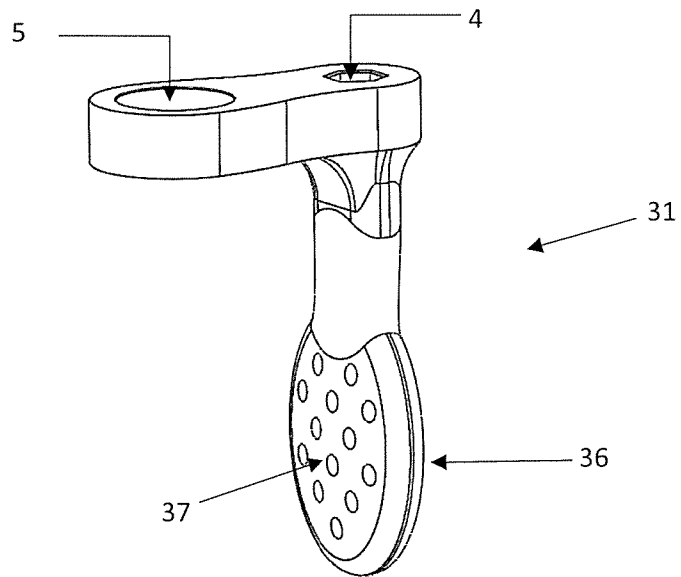


Figure 8

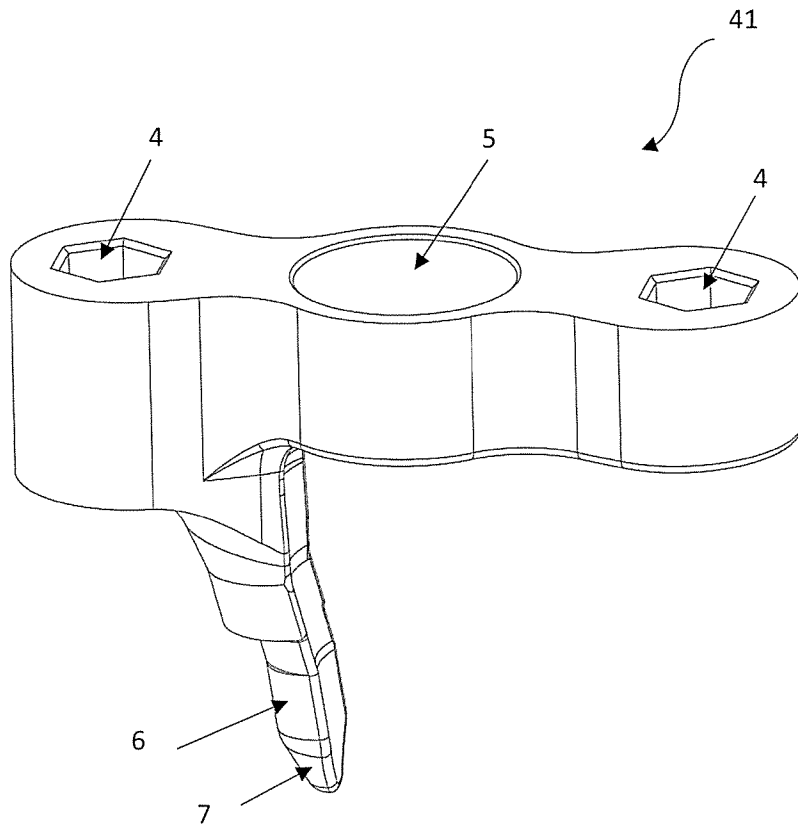


Figure 9

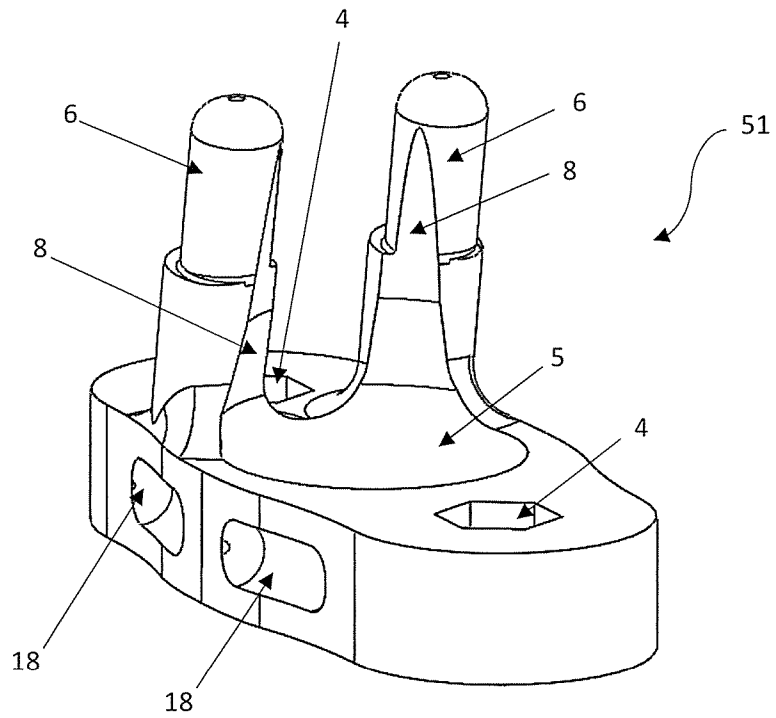


Figure 10

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/IB2017/053015**

## A. CLASSIFICATION OF SUBJECT MATTER

**A61C 1/08 (2006.01) A61C 8/00 (2006.01)**

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)

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)

EPODOC WPI: (A61C1/084/C/CNO and A61B17/176/C/CNO); A61C1/084/C/CNO & Keywords (Drill, Ream, Bore, Cut, Guide, Template, Align, Post, Pin, Locate, Anchor, Socket, Reshape) and similar terms and/or combinations; Google Patent & Keywords (Implant, Socket, Drill, Reshape, Guide, Jig, Align, Post, Pin, Upright) and similar terms and/or combinations; and Applicant/Inventor: McDonald Simon, Azenium IP; Searched using internal (provided by IP Australia) and external (AUSPAT, Google Patent, Espacenet) databases.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Documents are listed in the continuation of Box C		

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search 9 October 2017	Date of mailing of the international search report 09 October 2017
<b>Name and mailing address of the ISA/AU</b>  AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	<b>Authorised officer</b>  Roger Small AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61399359630

**INTERNATIONAL SEARCH REPORT**

International application No.

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

**PCT/IB2017/053015**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 2004/0013999 A1 (SUSSMAN) 22 January 2004 See: figs. 1 to 19; and paragraphs [0017], [0039] & [0042].	1-18
X	US 6062856 A (SUSSMAN) 16 May 2000 See: abstract; and figs. 1 to 8.	1-18
A	US 2009/0181340 A1 (WOLF et al.) 16 July 2009 See: abstract; and figs. 1 to 6.	
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A	US 2016/0022386 A1 (AZENIUM IP LIMITED) 28 January 2016 See: abstract & figs. 1 to 29.	

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/IB2017/053015**

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<b>Patent Document/s Cited in Search Report</b>		<b>Patent Family Member/s</b>	
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		WO 2014164923 A1	09 Oct 2014

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2009)

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/IB2017/053015**

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