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(54) **DENTAL IMPLANT SURGICAL GUIDE**

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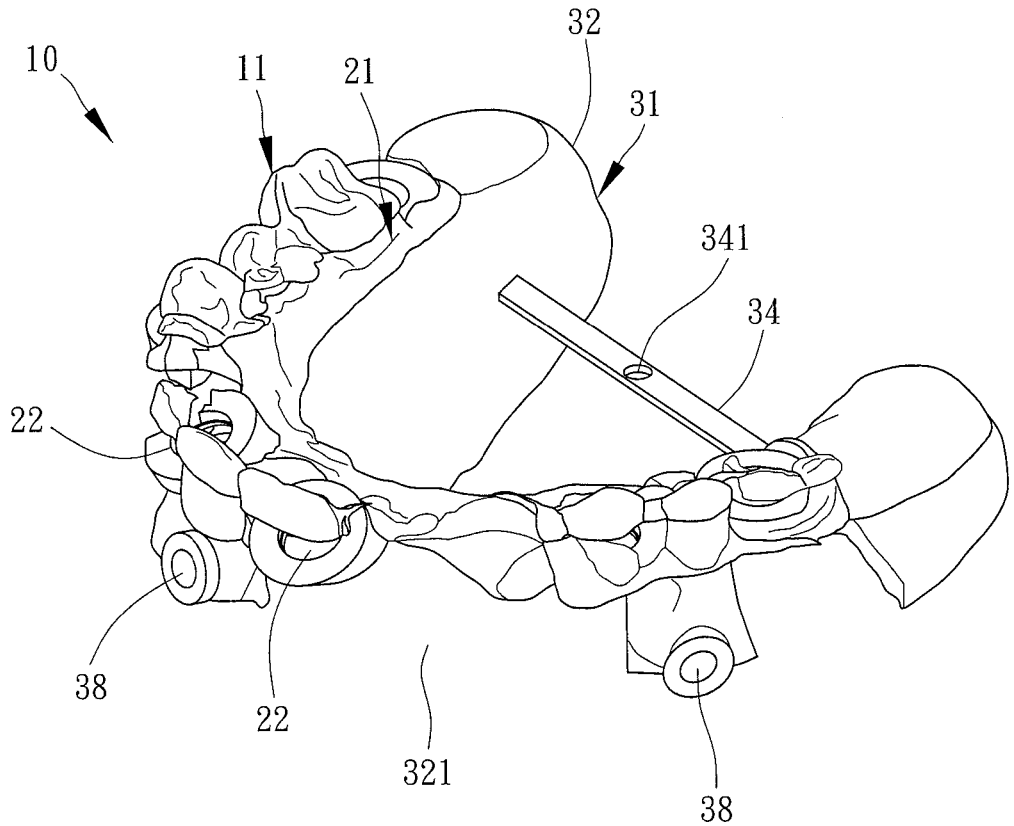
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(57) **ABSTRACT**

A dental implant surgical guide includes an upper guide member including a tooth mold and a plurality of first mating connector components, an intermediate guide member including a guide portion, a plurality of first connection portions and a plurality of second mating connector components, and a lower guide member including a body having a downward-facing recess, a plurality of second connection portions located on the top side of the body, a support bar having two opposite ends thereof respectively connected to the body at two predetermined locations and a mounting portion formed on the body.



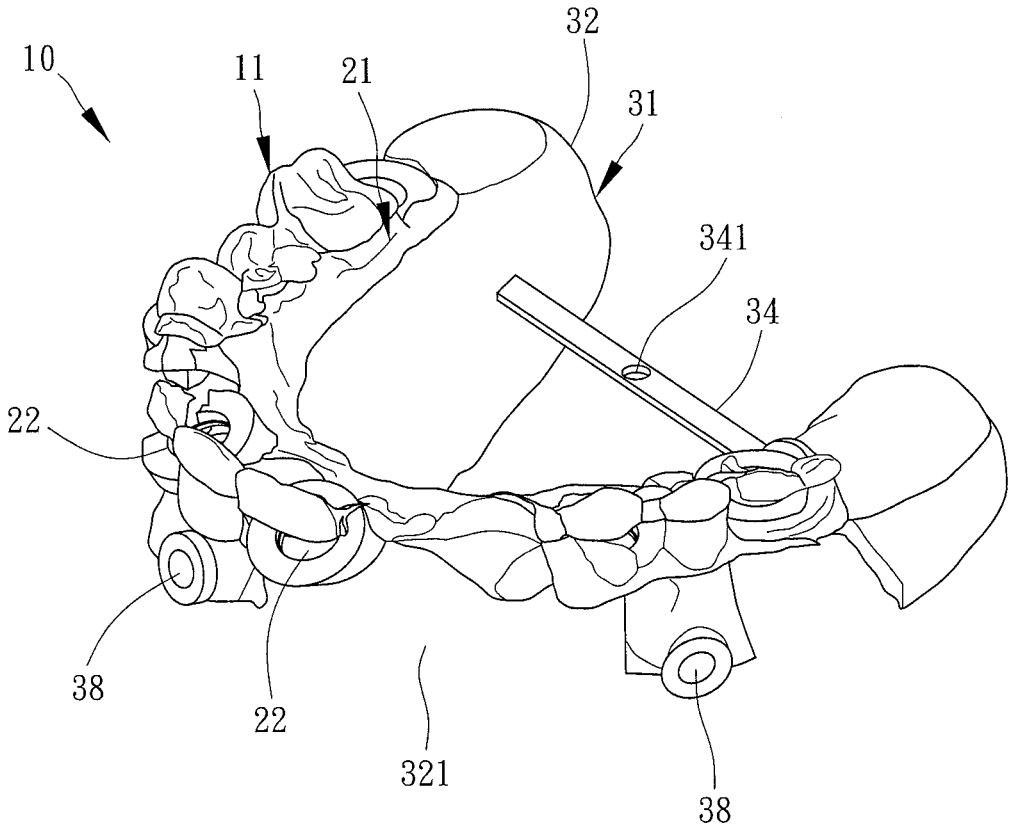


FIG. 1

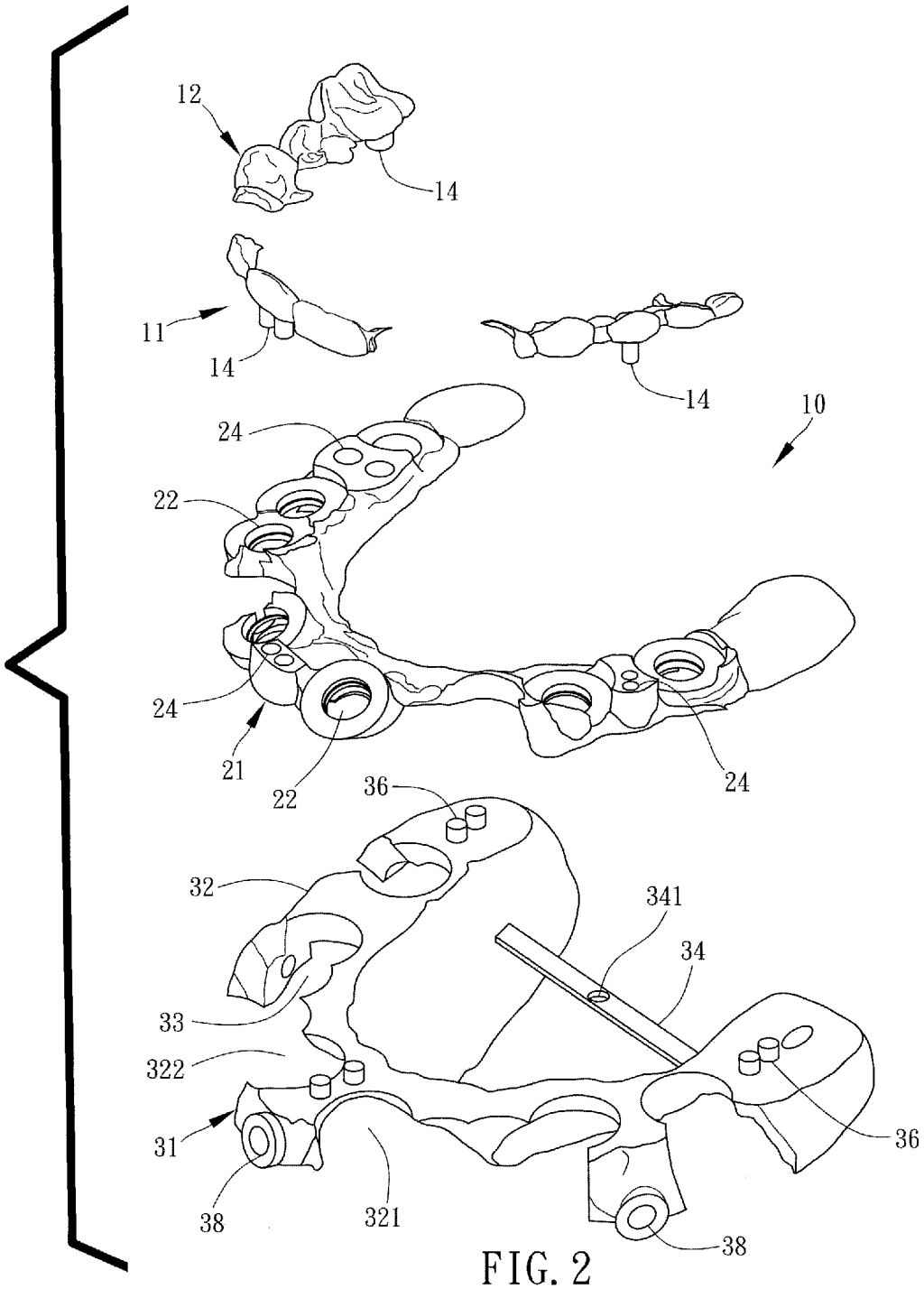


FIG. 2

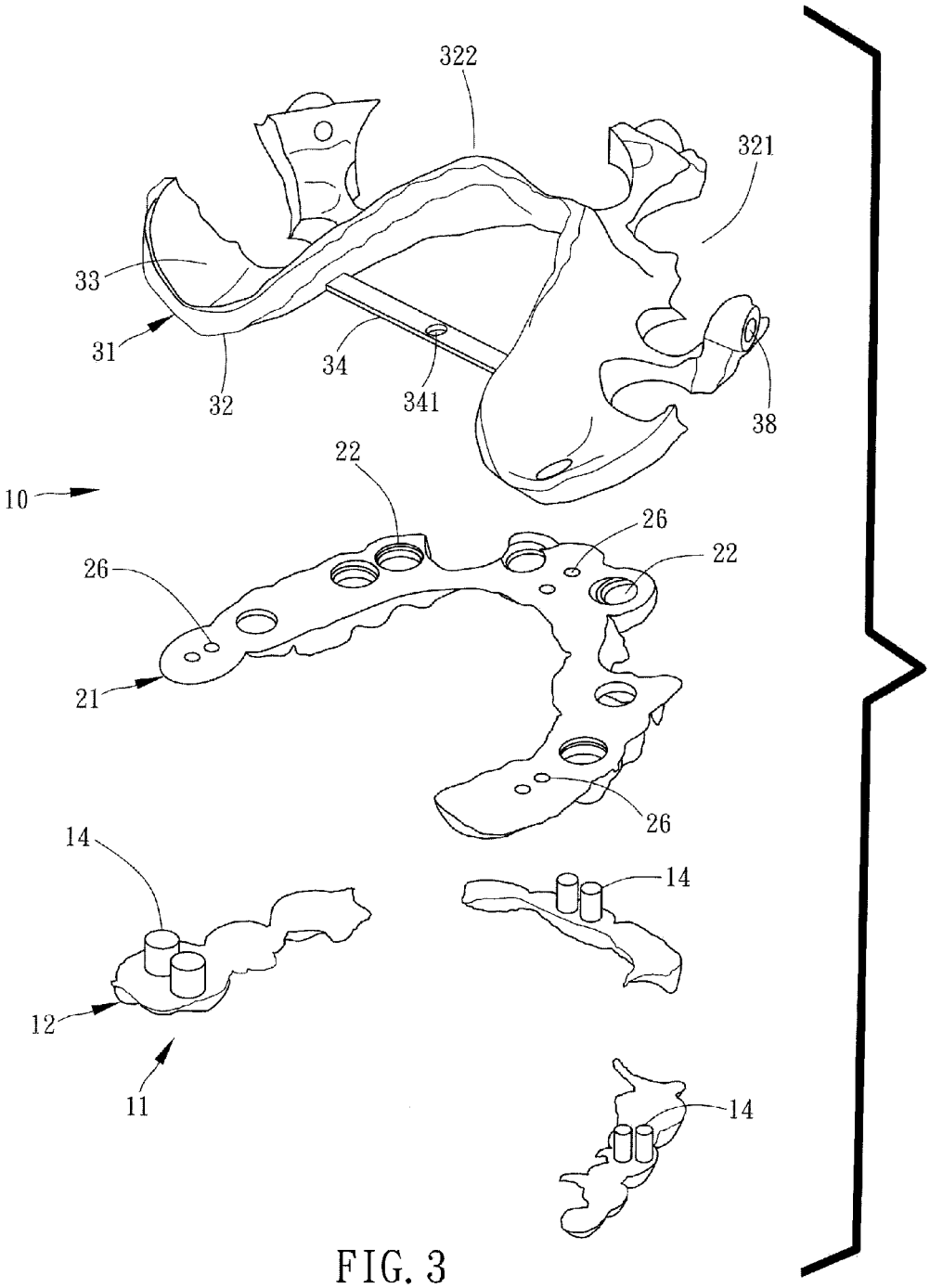


FIG. 3

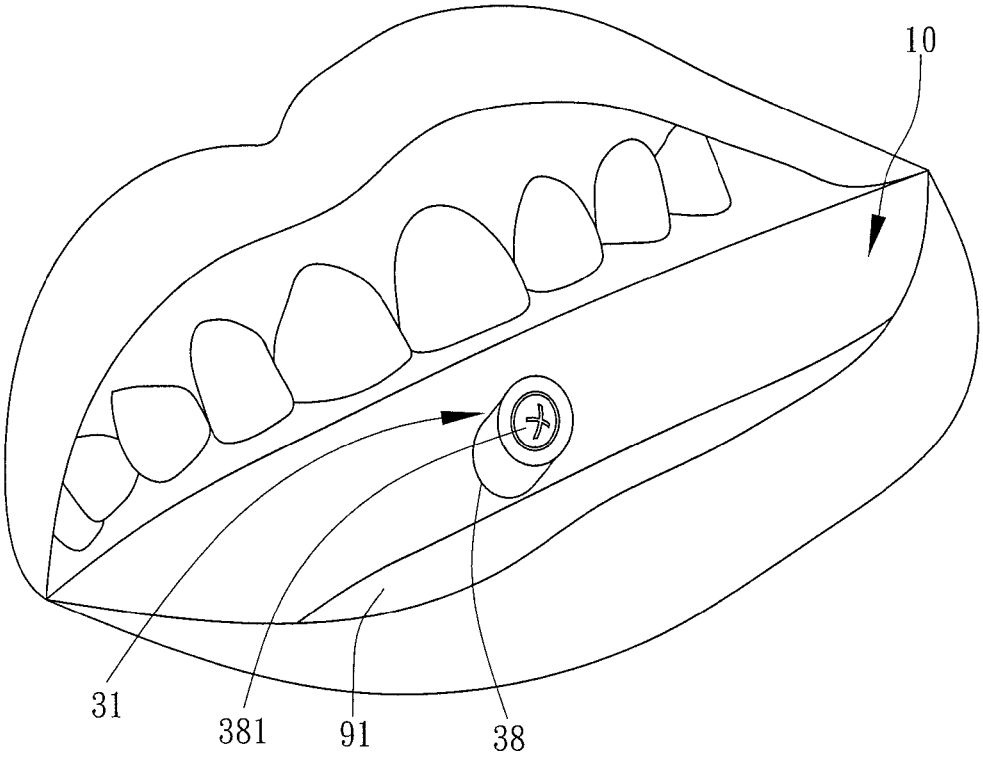


FIG. 4

DENTAL IMPLANT SURGICAL GUIDE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention The present invention relates to dental implant technology and more particularly, to a dental implant surgical guide.

[0002] 2. Description of the Related Art

[0003] Taiwan Patent I 284030 teaches the preparation of a dental implant surgical guide that improves drilling and implant installation accuracy and safety of dental implant surgery.

[0004] However, conventional dental implant surgical guides are not practical for direct use in a patient with too many missing teeth or full-mouth toothless. For use in a patient with too many missing teeth or full-mouth toothless, a conventional dental implant surgical guide can simply be attached to the gingiva. However, when installing a conventional dental implant surgical guide, it is necessary to mount a bite on the patient's gingiva, and then to mount the dental implant surgical guide on the bite. The bite is a clay-like plastic material attached to the gingiva and shaped. When the bite is cured, the dental implant surgical guide can then be fastened to the bite. Because gingiva is a part of the soft tissue, using a bite to install a dental implant surgical guide in a patient's gingival has poor positioning effects, and the dental implant surgical guide can slide. Such positioning inaccuracy may lead to incorrect location of implant, and therefore, conventional dental implant surgical guides are not suitable for patients with too many missing teeth or full-mouth toothless.

[0005] Further, conventional dental implant surgical guides do not provide spaces for gingiva flap surgery. If a conventional dental implant surgical guide is installed in the mouth of a patient, the dentist will no longer be able to perform a gingiva flap surgery.

SUMMARY OF THE INVENTION

[0006] The present invention has been accomplished under the circumstances in view. It is the main object of the present invention to provide a dental implant surgical guide, which is suitable for patients with too many missing teeth or full-mouth toothless.

[0007] To achieve this and other objects of the present invention, a dental implant surgical guide comprises: an upper guide member comprising a tooth mold for tight engagement with the natural teeth or temporary dentures of the opposite jaw when the patient bites, and a plurality of first mating connector components; an intermediate guide member comprising at least one guide portion for providing guidance in the dental implant surgery procedure, a plurality of first connection portions respectively connected to the first mating connector components to secure the upper guide member and the intermediate guide member together, and a plurality of second mating connector components; and a lower guide member comprising a body defining therein a downward-facing recess for mating with the gingiva of the patient, a plurality of second connection portions located on a top side of the body and adapted for the connection of the first mating connector components to secure the lower guide member and the intermediate guide member together, a support bar having two opposite ends thereof respectively connected to the body at two predetermined locations, and at least one mounting portion formed on the body and adapted for the mounting of equal number of mounting members to secure the lower guide member to the gingiva of the patient.

[0008] Thus, by means of mating the downward-facing recess with the patient's gingiva, the dental implant surgical guide can be initially secured to the patient's gingiva, and then mounting members can be mounted in the mounting portions to secure the lower guide member to the patient's gingiva of the patient. Therefore, the dental implant surgical guide of the invention is suitable for patients with too many missing teeth or full-mouth toothless.

[0009] It is another object of the present invention to provide a dental implant surgical guide, which provides sufficient space for gingiva flap surgery.

[0010] Preferably, the body of the lower guide member defines at least one flap space that provides the necessary space for gingiva flap surgery.

[0011] Other advantages and features of the present invention will be fully understood by reference to the following specification in conjunction with the accompanying drawings, in which like reference signs denote like components of structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. **1** is an oblique top elevational assembly view of a dental implant surgical guide in accordance with the present invention.

[0013] FIG. **2** is an exploded view of the dental implant surgical guide in accordance with the present invention.

[0014] FIG. **3** corresponds to FIG. **2** when viewed from another angle.

[0015] FIG. **4** is a schematic drawing illustrating a status of use of the dental implant surgical guide in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Referring to FIGS. **1-3**, a dental implant surgical guide **10** in accordance with the present invention is shown. The double nut ball screw **10** comprises an upper guide member **11**, an intermediate guide member **21**, and a lower guide member **31**.

[0017] The upper guide member **11** comprises a tooth mold **12** and a plurality of first mating connector components **14**. The tooth mold **12** is adapted for tight engagement with the natural teeth or temporary dentures of the opposite jaw when the patient bites. In this embodiment, the tooth mold **12** consists of three component parts.

[0018] The intermediate guide member **21** comprises at least one guide portion **22**, a plurality of first connection portions **24** and a plurality of second mating connector components **26**. The first connection portions **24** are respectively connected to the first mating connector components **14** to secure the upper guide member **11** and the intermediate guide member **21** together. In this embodiment, the intermediate guide member **21** comprises a plurality of guide portions **22** for providing guidance in the dental implant surgery procedure.

[0019] The lower guide member **31** comprises a body **32** defining therein a downward-facing recess **33**, a plurality of second connection portions **36** located on a top side of the body **32**, a support bar **34** with two opposite ends thereof respectively connected to the body **32** at two predetermined

locations for providing support to enhance the overall structural rigidity of the lower guide member **31**, and at least one mounting portion **38** formed on the body **32**. The downward-facing recess **33** is adapted for mating with the gingiva of the patient. The second connection portions **36** are adapted for the connection of the first mating connector components **26** to secure the lower guide member **31** and the intermediate guide member **21** together. In this embodiment, the lower guide member **31** comprises a plurality of mounting portions **38** adapted for the mounting of equal number of mounting members **381** to secure the lower guide member **31** to the gingiva of the patient by means of friction resistance between the mounting members **381** and the jawbone of the patient. In this embodiment, the mounting members **381** can be plug pins or screw bolts.

[0020] In this embodiment, the first mating connector components **14** and the first connection portions **24** establish a connection relationship therebetween by plugging respectively plug pins into respective through holes. The first mating connector components **14** or first connection portions **24** can be plug pins, and the first connection portions **24** or first mating connector components **14** can be through holes for receiving the respective plug pins. Further, the first mating connector components **26** and the second connection portions **36** can also establish a connection relationship therebetween by plugging respectively plug pins into respective through holes.

[0021] After understanding of the architecture of the dental implant surgical guide **10**, the application of the dental implant surgical guide **10** is explained hereinafter.

[0022] As illustrated in FIGS. **1-4**, assemble the upper guide member **11** and the intermediate guide member **21** by means of fastening the first mating connector components **14** and the first connection portions **24** together, and then assemble the lower guide member **31** and the intermediate guide member **21** by means of fastening the first mating connector components **26** and the second connection portions **36** together, and thus, the desired dental implant surgical guide **10** is assembled. Thereafter, use the downward-facing recesses **33** to secure the dental implant surgical guide **10** to the patient's gingiva **91**. By means of mating the downward-facing recess **33** with the patient's gingiva **91**, an initial positioning effect is achieved. Thereafter, let the patient practice biting, enabling the tooth mold **12** of the upper guide member **11** to be forced into tight engagement with the natural teeth or temporary dentures of the patient's opposite jaw. During the biting action, the lower guide member **31** is slightly moved relative to the gingiva **91** to achieve fine position adjustment. At final, mount respective mounting members **381** in the respective mounting portions **38** to secure the lower guide member **31** to the patient's gingiva **91** by means of friction resistance between the mounting members **381** and the patient' jawbone.

[0023] At this time, the installation of the dental implant surgical guide **10** is done, and the follow-up drilling or implant installation procedure can then be performed. During the drilling or implant installation procedure, the guide portions **22** provide guidance.

[0024] When wishing to remove the dental implant surgical guide **10** from the patient's gingiva **91**, dismount the mounting members **381** for allowing removal of the dental implant surgical guide **10** directly and freely.

[0025] It's worth mentioning that, in actual application, the upper guide member **11** can be a one-piece member, or consists of multiple component parts. In this embodiment, the upper guide member **11** consists of three component parts. Similarly, the intermediate guide member **21** can be a one-piece member, or consists of multiple component parts. In this embodiment, the intermediate guide member **21** is a one-piece member. The lower guide member **31** can be a one-piece member, or consists of multiple component parts. In this embodiment, the lower guide member **31** is a one-piece member. As long as each component part has corresponding connection portions or mating connector components, it can be assembled with the other component parts to achieve positioning of the multiple component parts and to provide the expected function of the respective layer.

[0026] Further, additional components can be added to the dental implant surgical guide **10** to provide added functions. For example, the body **32** of the lower guide member **31** further defines at least one flap space **321** that provides the necessary space for gingiva flap surgery. However, the at least one flap space **321** is not requisite. Without the at least one flap space **321**, the dental implant surgical guide **10** can still achieve the expected mounting and positioning effects.

[0027] The body **32** of the lower guide member **31** further defines at least one fenestration portion **322** that provides the necessary space for sinus fenestration. However, the at least one fenestration portion **322** is not requisite. Without the at least one fenestration portion **322**, the dental implant surgical guide **10** can still achieve the expected mounting and positioning effects.

[0028] The aforesaid at least one flap space **321** and at least one fenestration portion **322** are adapted to provide surgical spaces that may needed during dental implant surgery, facilitating implementation of the complete dental implant procedure.

[0029] Further, the support bar **34** can be configured to provide an inspection hole **341** for allowing the dentist to visually check whether the lower guide member **31** has been closely attached to the oral internal organization of the patient or not. For example, if the dental implant surgical guide **10** is to be attached to the upper gingiva, the dentist can see through the inspection hole **341** to check whether the lower guide member **31** has been closely attached to the upper jaw of the patient or not. In this case, the support bar **34** must be arch-shaped; if the dental implant surgical guide **10** is to be attached to the lower gingiva, the dentist can see through the inspection hole **341** to check whether the lower guide member **31** has been closely attached to the tongue of the patient or not. In this case, the support bar **34** can be a straight bar.

1. A dental implant surgical guide, comprising:

an upper guide member comprising a tooth mold and a plurality of first mating connector components, said tooth mold being adapted for engagement with natural teeth or temporary dentures of the opposite jaw when a patient bites;

an intermediate guide member comprising at least one guide portion for providing guidance in the dental implant surgery procedure, a plurality of first connection portions respectively connected to said first mating connector components to secure said upper guide member and said intermediate guide member together, and a plurality of second mating connector components; and

a lower guide member comprising a body defining therein a downward-facing recess for mating with the gingiva

of the patient, a plurality of second connection portions located on a top side of the body and adapted for the connection of said first mating connector components to secure said lower guide member and said intermediate guide member together, a support bar having two opposite ends thereof respectively connected to said body at two predetermined locations, and at least one mounting portion formed on said body and adapted for the mounting of equal number of mounting members to secure said lower guide member to the gingiva of the patient,

wherein the body of the lower guide member is a U-shaped member having two arms, and

wherein the support bar is a straight bar and the two opposite ends of the support bar are connected to the two aims of the body of the lower guide member, respectively.

2. The dental implant surgical guide as claimed in claim **1**, wherein said body of said lower guide member further defines at least one flap space that provides the necessary space for gingiva flap surgery.

3. The dental implant surgical guide as claimed in claim **1**, wherein said body of said lower guide member further defines at least one fenestration portion that provides the necessary space for sinus fenestration.

4. The dental implant surgical guide as claimed in claim **1**, wherein said upper guide member consists of a plurality of component parts.

5. The dental implant surgical guide as claimed in claim **1**, wherein said intermediate guide member consists of a plurality of component parts.

6. The dental implant surgical guide as claimed in claim **1**, wherein said lower guide member consists of a plurality of component parts.

7. The dental implant surgical guide as claimed in claim **1**, wherein said first mating connector components and said first connection portions establish a connection relationship therebetween by plugging respectively plug pins into respective through holes.

8. The dental implant surgical guide as claimed in claim **1**, wherein said first mating connector components and said second connection portion establish a connection relationship therebetween by plugging respectively plug pins into respective through holes.

9. The dental implant surgical guide as claimed in claim **1**, wherein said support bar defines therein an inspection hole.

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