SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided an applicator for effecting an intraligamentary injection of a liquid anesthetic into gingival sulcus of a dental patient, the applicator comprising: a body member having a chamber with a first diameter; a planar elongated tip disposed on a distal end of the body member. the planar elongated tip being substantially planar in a longitudinal plane of the elongated tip; a passageway extending through the elongated tip between the body member at a proximal end of the elongated tip and a distal end of the elongated tip, the passageway having a second diameter less than the first diameter; and an attachment device disposed on a proximal end of the body member, the attachment device configured to secure the body member to a liquid anesthetic reservoir, the passageway having the second diameter less than the first diameter being configured to increase the fluid pressure on the liquid anesthetic, facilitating disposition of the liquid anesthetic into a the gingival sulcus of the patient.

Disclosed herein is an applicator for effecting an injection of a liquid anesthetic into the tissue of a person. That applicator basically comprises a coupling, an elongated member having a distal end portion in the form of a hollow skirt having a free edge, and an elongated cannula having an open distal end located within the skirt proximally of the free edge. The open distal end of the cannula is sharp. The coupling is arranged for securing the applicator to a source of liquid anesthetic, whereupon the liquid anesthetic may be selectively introduced within the cannula and from there into the hollow skirt. The hollow skirt is formed of a flexible material suitable for producing a substantially fluid-tight interface with the tissue to locally anesthetize the tissue when the liquid anesthetic is introduced into the hollow skirt. The sharp distal end of the cannula is movable relative to the free edge of the hollow skirt to enable the sharp distal end to penetrate the tissue to inject the liquid anesthetic into the tissue. The applicator may optionally include electrodes forming a portion of a transcutaneous electrical nerve stimulation (TENS) unit.

Disclosed herein is a method for effecting an intraligamentary injection of a liquid anesthetic into the gingival sulcus of a patient. That method basically entails providing an applicator comprising an elongated member having a hollow interior, an open distal free end, and a portion located proximally of the open distal free end in communication with the hollow

interior. The open distal free end of the elongated member is formed of a resilient and somewhat conformable material. The open distal free end of the elongated member is introduced into the gingival sulcus to engage the anatomic structures at the gingival sulcus wherein the resilient and conformable material at the open distal free end produces a substantially fluid-tight interface thereat. A liquid anesthetic is provided into the hollow interior of the elongated member and through the open distal free end into the gingival sulcus so that the liquid anesthetic is directed downward along the root of the adjacent tooth and is prevented from flowing upward and outward by the fluid-tight interface.

Disclosed herein is a method for effecting an injection of a liquid anesthetic into the tissue of a person. The method basically entails providing an applicator having a distal end portion in the form of a skirt having hollow interior and a peripheral free edge. The applicator also comprises an elongated cannula having an open distal end located within the skirt proximally of the free edge. The open distal end of the cannula is sharp. The hollow skirt is formed of a flexible material. The free edge of the hollow skirt is placed into engagement with the tissue of the person, whereupon the flexible material at the free end of the skirt produces a substantially fluid-tight interface with the tissue. Liquid anesthetic is provided into the hollow interior of the skirt and into engagement with a portion of the tissue bounded by the peripheral free edge of the skirt to anesthetize the tissue thereat. The sharp distal end of the cannula is moved relative to the free edge of the hollow skirt to cause the sharp distal end to penetrate the portion of the tissue to inject the liquid anesthetic therein. The applicator may optionally include electrodes forming a portion of a transcutaneous electrical nerve stimulation (TENS) unit so that the unit may be operated during the injection procedure. By way of example, but not limitation, instead of providing the liquid anesthetic into the hollow interior of the skirt to anesthesize the tissue thereat, the TENs unit can be operated to anesthesize the tissue, whereupon after the tissue has been anesthesized the cannula may be moved to cause its sharp end to penetrate the tissue. The tissue may comprise the gum and underlying tissue of a dental patient or any other tissue of a person.

According to a second aspect of the present invention, there is provided a system for introducing a liquid treatment to a dental patient comprising: an elongated body portion being a substantially planar flexible member and having a chamber, the chamber having a first diameter;

a tip disposed at the distal end of the elongated body portion, the tip having a size and cross-section so as to be atraumatic to a patient, the tip being substantially planar in a longitudinal plane of the tip, and the tip having shape configured to at least: enter a gingival sulcus region of the patient between the gingival sulcus and a tooth of the patient; form a substantially fluid-tight interface with one or more anatomical structures of a patient at the gingival sulcus region of the patient; deliver the liquid treatment toward a root of the tooth of the patient; and, inhibit flow of the liquid treatment away from the root of the tooth of the patient; and, a passageway extending through the elongated body portion and the tip and terminating at a distal end of the tip, the passageway having a second diameter less than the first diameter, the second diameter being less than the first diameter increasing the fluid pressure on the liquid treatment to deliver the liquid treatment through the elongated body portion to the tip and toward the root of the tooth of the patient.

CLAIMS

1. An applicator for effecting an intraligamentary injection of a liquid anesthetic into gingival sulcus of a dental patient, the applicator comprising:

a body member having a chamber with a first diameter;

a planar elongated tip disposed on a distal end of the body member. the planar elongated tip being substantially planar in a longitudinal plane of the elongated tip;

a passageway extending through the elongated tip between the body member at a proximal end of the elongated tip and a distal end of the elongated tip, the passageway having a second diameter less than the first diameter; and

an attachment device disposed on a proximal end of the body member, the attachment device configured to secure the body member to a liquid anesthetic reservoir, the passageway having the second diameter less than the first diameter being configured to increase the fluid pressure on the liquid anesthetic, facilitating disposition of the liquid anesthetic into a the gingival sulcus of the patient.

2. The applicator of claim 1, wherein the distal end of the elongated tip is of a substantially flat profile in cross-section.

3. The applicator of claim 1, wherein the distal end of the elongated tip is formed of plastic.

4. The applicator of claim 1, wherein the distal end of the elongated tip is rounded in a first plane and wherein a peripheral edge of the distal end of the elongated tip is tapered in a second plane orthogonal to the first plane.

5. The applicator of claim 1, wherein the elongated tip has a thickness between 0.5 mm and 1 mm and a width of between 2 mm and 5 mm.

6. The applicator of claim 1, wherein the attachment device is configured to attach to a syringe.

7. The applicator of claim 1, wherein the elongated tip has three sizes, including:

a longitudinal size;

a lateral size less than the longitudinal size; and

a depth size less than the lateral size;

wherein at least the three sizes of the elongated tip forming a planar member.

8. A system for introducing a liquid treatment to a dental patient comprising:

an elongated body portion being a substantially planar flexible member and having a chamber, the chamber having a first diameter;

a tip disposed at the distal end of the elongated body portion, the tip having a size and cross-section so as to be atraumatic to a patient, the tip being substantially planar in a longitudinal plane of the tip, and the tip having shape configured to at least:

enter a gingival sulcus region of the patient between the gingival sulcus and a tooth of the patient;

form a substantially fluid-tight interface with one or more anatomical structures of a patient at the gingival sulcus region of the patient;

deliver the liquid treatment toward a root of the tooth of the patient; and,

inhibit flow of the liquid treatment away from the root of the tooth of the patient; and,

a passageway extending through the elongated body portion and the tip and terminating at a distal end of the tip, the passageway having a second diameter less than the first diameter, the second diameter being less than the first diameter increasing the fluid pressure on the liquid treatment to deliver the liquid treatment through the elongated body portion to the tip and toward the root of the tooth of the patient.