SUMMARY OF THE INVENTION

~~In accordance with one aspect of the invention there is provided an applicator for effecting an intraligamentary injection of a liquid anesthetic into the gingival sulcus of a patient. The applicator basically comprises a body member having an elongated tip. The tip is a generally planar, thin member having an atraumatic free end and a passageway extending therethrough and terminating at the free end of the tip. The applicator is arranged to be secured to a source of liquid anesthetic, whereupon the liquid anesthetic may be selectively introduced into the applicator. The free end of the elongated tip of the applicator is arranged for producing a substantially fluid-tight interface with the anatomic structures at the gingival sulcus, whereupon the liquid anesthetic may be forced from the applicator through the passageway out of the open free end of the tip to enter into the gingival sulcus so that it is directed downward along the root of the adjacent tooth and is prevented from flowing upward and outward.~~

According to a first aspect of the present invention, there is provided a applicator for effecting an intraligamentary injection of a liquid anesthetic into the gingival sulcus of a dental patient, said applicator comprising: a body member having an elongated tip, said elongated tip projecting from the body member and being a generally substantially planar member in a first dimension, and being a substantially thin flexible member in a second dimension having an atraumatic a distal end and a passageway extending therethrough through the flexible member and terminating at said distal end of said elongated tip, said applicator being arranged to be secured to a source of liquid anesthetic, whereupon the liquid anesthetic may be selectively introduced into said applicator , said distal end of said elongated tip being arranged configured to for produceing a substantially atraumatic fluid-tight interface with the one or more anatomic structures at the gingival sulcus, whereupon the liquid anesthetic may be forced from said applicator through said passageway out of said open distal end of said tip configured to enter into the gingival sulcus and having an opening configured to so that it is directed the liquid anesthetic downward along the root of the tooth and is prevented the liquid anesthetic from flowing upward and outward away from the root of the tooth, at least a portion of the body member being configured to enter the gingival sulcus of the patient.

~~In accordance with another aspect of this invention there is provided~~ 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.

~~In accordance with another aspect of this invention there is provided~~ 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.

~~In accordance with another aspect of this invention there is provided~~ 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; 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 having

shape configured to: enter the gingival sulcus of the patient; form a substantially fluid-tight interface with one or more anatomical structures of a dental patient at a gingival sulcus region of the patient; deliver a liquid therapeutic to the gingival sulcus of the patient toward a root of a tooth of the dental patient; and, inhibit flow of the liquid therapeutic away from the root of the tooth of the dental patient; and, a passageway extending through the elongated body portion and terminating at a distal end of the tip, the passageway configured to deliver liquid therapeutic through the elongated body portion to the tip.

CLAIMS

~~I claim:~~

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

a body member having an elongated tip, said elongated tip projecting from the body member and being a ~~generally~~ substantially planar member in a first dimension~~,~~ and being a substantially thin flexible member in a second dimension having ~~an atraumatic~~ a distal end and a passageway extending ~~therethrough~~ through the flexible member and terminating at said distal end of said elongated tip, said applicator being arranged to be secured to a source of liquid anesthetic, ~~whereupon the liquid anesthetic may be selectively introduced into said applicator~~, said distal end of said elongated tip being ~~arranged~~ configured to ~~for~~ produce~~ing~~ a substantially atraumatic fluid-tight interface with ~~the~~ one or more anatomic structures at the gingival sulcus, ~~whereupon the liquid anesthetic may be forced from said applicator through said passageway out of~~ said ~~open~~ distal end of said tip configured to enter into the gingival sulcus and having an opening configured to ~~so that it is~~ directed the liquid anesthetic downward along the root of the tooth and ~~is~~ prevented the liquid anesthetic from flowing ~~upward and outward~~ away from the root of the tooth, at least a portion of the body member being configured to enter the gingival sulcus of the patient.

2. The anesthetic applicator of Claim 1 wherein said ~~free~~ distal end of said tip is of a ~~generally~~ substantially flat profile in cross-section.

~~3. The anesthetic applicator of Claim 1 wherein said distal end of said tip is somewhat flexible.~~

4~~3~~. The anesthetic applicator of Claim ~~3~~ 1 wherein said distal end of said tip is formed of plastic.

5~~4~~. The anesthetic applicator of Claim 2 wherein said distal end of said tip is rounded and wherein ~~the~~ a peripheral edge of the distal end of said tip is tapered.

~~6~~5. The anesthetic applicator of Claim ~~5~~4 wherein said applicator is 0.5 to 1 mm thick and 2 to 5 mm wide.

~~7~~6. The anesthetic applicator of Claim ~~6~~5 wherein said ~~distal end of said tip is rounded and wherein the peripheral edge the distal end of said tip is tapered~~ source of liquid anesthetic includes a syringe.

~~8. An applicator for effecting an injection of a liquid anesthetic into the tissue of a person, said applicator comprising 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 said skirt proximally of said free edge, said open distal end being sharp, said coupling being arranged for securing said applicator to a source of liquid anesthetic, whereupon the liquid anesthetic may be selectively introduced within said cannula and from there into said hollow skirt, said hollow skirt being 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 said hollow skirt, said sharp distal end of said cannula being movable relative to said free edge of said hollow skirt to enable said sharp distal end to penetrate the tissue to inject the liquid anesthetic therein.~~

~~9. The anesthetic applicator of Claim 8 wherein said free edge of said skirt is formed of silicone.~~

~~10. The anesthetic applicator of Claim 8 including electrodes forming a portion of a transcutaneous electrical nerve stimulation (TENS) unit.~~

~~11. A method for effecting an intraligamentary injection of a liquid anesthetic into the gingival sulcus of a dental patient, said method comprising:~~

~~a) providing an applicator comprising a body member having an elongated tip, said tip being a generally planar, thin member having an atraumatic free end and a passageway extending therethrough and terminating at an opening in said free end of said tip, said adapter being arranged to be secured to a source of liquid anesthetic;~~

b) introducing said open free end of said tip into the gingival sulcus to engage the anatomic structures at the gingival sulcus wherein said tip produces a substantially fluid tight interface thereat; and

c) providing a liquid anesthetic into said applicator and through said opening in said free end of said tip 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 said fluid-tight interface.

12. The method of Claim 11 wherein said elongated member is of a generally flat profile in cross-section.

13. The method of Claim 11 wherein said distal end of said tip is somewhat flexible.

14. The method of Claim 12 wherein said free end of said tip is rounded and wherein the peripheral edge the distal portion of said tip is tapered.

15. The method of Claim 14 wherein said applicator is 0.5 to 1 mm thick and 2 to 5 mm wide.

16. The method of Claim 11 further comprising securing said adapter to said source of liquid anesthetic, wherein said source of liquid anesthetic is a syringe optionally including a needle that is received by the adapter such that said needle will not contact the dental patient.

17. A method for effecting an injection of a liquid anesthetic into the tissue of a person, said method comprising:

a) providing an applicator having a distal end portion in the form of a skirt having hollow interior and a peripheral free edge, said applicator also comprising an elongated cannula having an open distal end located within said skirt proximally of said free edge, said open distal end of said cannula being sharp, said hollow skirt being formed of a flexible material;

b) placing said free edge of said hollow skirt into engagement with the tissue of the person, whereupon said flexible material at said free end of said skirt produces a substantially fluid-tight interface with the tissue;

~~c) providing a liquid anesthetic into said hollow interior of said skirt and into engagement with a portion of the tissue of the person bounded by said peripheral free edge of said skirt to anesthetize the tissue thereat; and~~

~~d) moving said sharp distal end of said cannula relative to said free edge of said hollow skirt to cause said sharp distal end to penetrate the portion of the tissue to inject the liquid anesthetic therein.~~

~~18. The method of Claim 17 wherein said hollow skirt maintains said fluid tight interface with the tissue as said sharp distal end of said cannula penetrates the tissue to inject the liquid anesthetic therein.~~

~~19. The method of Claim 17 wherein peripheral free edge of said hollow skirt is formed of silicone.~~

~~20. The method of Claim 17 wherein said applicator includes electrodes forming a portion of a transcutaneous electrical nerve stimulation (TENS) unit and wherein said method additionally comprises operating said TENS unit.~~

~~21. The method of Claim 20 wherein instead of providing said liquid anesthetic into said hollow interior of said skirt to anesthesize the tissue thereat, said TENs unit is operated to anesthesize said tissue, whereupon after said tissue has been anesthesized said cannula may be moved to cause said sharp end to penetrate said tissue.~~

~~22. The method of Claim 17 wherein the person is a dental patient and wherein said tissue comprises the gum and underlying anatomic structure.~~

~~23. The method of Claim 20 wherein the person is a dental patient and wherein said tissue comprises the gum and underlying anatomic structure.~~

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

an elongated body portion being a substantially planar flexible member;

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 having shape configured to:

enter the gingival sulcus of the patient;

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

deliver a liquid therapeutic to the gingival sulcus of the patient toward a root of a tooth of the dental patient; and,

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

a passageway extending through the elongated body portion and terminating at a distal end of the tip, the passageway configured to deliver liquid therapeutic through the elongated body portion to the tip.