

may be provided with a gauging means by which the orientation and spacing of the distal tip with respect to the target tissue may be visually-assessed by the physician. As shown in FIGS. 8, 14 and 15, the device may include a pair of feeler elements 234 attached to and extending distally from the distal end of the tip member 214. The feeler elements 234 diverge and preferably are provided with enlarged bumper pads 236 at their distal ends. The feeler elements 234 extend a distance from the outlet orifice 232 corresponding to the optimal distance of the device from the surface to be sprayed and irradiated. The feeler elements 234 are flexible. They may be formed, for example, from polyethylene. The bumper pads 236 serve to protect the tissue by providing a relatively broad area of contact with the tissue. When the device is in place in the operative region, the physician will be observing the distal end of the device, for example, through a laparoscope. The physician will be able to observe when the bumper pads 236 have engaged the tissue by observing flexing of the feeler elements 234 which will begin to spread apart. Such spreading can be observed and provides an indication that contact has been made. By observing the manner and location of the pads 236 engage the tissue, the physician can verify the orientation and spacing of the tip 108 with respect to the tissue. The gauge also may be made with a single feeler element mounted to the shaft 106 so that it extends at an angle to the axis of the shaft. In this embodiment, the physician can observe the relative movement of the single feeler element with respect to the distal tip of the shaft.

The angle defined between the feelers 234 should be selected to assure sufficient separation so as not to interfere with the spray pattern of liquid prepolymer emitted from the nozzle. The feelers 234 should be spread to be wider than the cone angle 238 defined by the spray 240.

In order to insert the device with the feelers 234 through the trocar cannula 81 (see FIG. 5) leading to the surgical site, the feelers must be drawn together to fit through the trocar cannula. To that end, the device may be provided with a sheath 242, slidable along the shaft 106 and adapted to project distally beyond the tip 108 to enclose and draw together the feelers 234. The slidable sheath 242 can be inserted through the trocar cannula and is provided with an enlarged proximal collar 244 that is too large to be inserted into the trocar cannula 81. The sheath may be shorter than the trocar cannula. When the device is inserted through the trocar cannula, the sheath will maintain the feelers together until the proximal collar engages the proximal end of the trocar cannula. Further advancement of the device will cause the feelers to emerge from the distal end of the sheath and trocar cannula where they will spread under the influence of their own resilience.

Although, for convenience in the foregoing description, certain features of the invention may have been disclosed only in connection with one of the embodiments, it is intended that the characteristics and features of each embodiment may be incorporated in the other, to the extent that they are compatible. For example, feeler gauges or aspiration lumens may be provided with the embodiment illustrated in FIGS. 1-5.

It should be understood that although the invention has been described as being used with a device having a rigid shaft, the invention also may be employed with application systems in which the shaft, or part of the shaft, is flexible or articulated, as in a flexible or articulated catheter. Additionally, it should be appreciated that the invention may be practiced with other compositions than those described explicitly in the above-identified Hubbell patent applications

including, but not limited to, compositions that may be later developed.

It also should be understood that the foregoing description of the invention is intended merely to be illustrative thereof and that other embodiments, modifications and equivalents may be apparent to those skilled in the art without departing from its spirit.

Having thus described the invention, what we desire to claim and secure by Letters Patent is:

1. A method of applying polymeric, non-fluent material to mammalian tissue, comprising:

applying an initially entirely fluent, pre-polymeric material to the tissue by emitting the pre-polymeric material from an emission element located on an applicator; and

applying to the material actinic light from an emitter of actinic light located on the applicator for a period of time sufficient to convert the material to a polymeric, non-fluent condition.

2. A method as in claim 1, the applying step comprising applying a predetermined volume of fluent, pre-polymeric material to the tissue.

3. A method as in claim 1, wherein the step of applying fluent pre-polymeric material to the tissue involves forming a coating of fluent pre-polymeric material on the tissue, and the step of applying actinic light involves converting the coating of fluent pre-polymeric material to a coating of polymeric, non-fluent material on the tissue.

4. A method as in claim 1, wherein the step of applying pre-polymeric material to the tissue involves emitting the pre-polymeric material from an emission element located at a distal portion of an applicator having a proximal portion and a distal portion, and

the step of applying actinic light involves applying the actinic light from an emitter of actinic light located at the distal portion of the applicator.

5. A method as in claim 4 wherein the step of applying actinic light further involves activating a source of actinic light that is connected, via an optical connector, to the emitter of actinic light.

6. A method as in claim 4 wherein the step of applying pre-polymeric material further involves dispersing the pre-polymeric material from a nozzle that is a component of the emission element, in a predetermined pattern.

7. A method as in claim 4, wherein the actinic light is emitted from the distal portion of the applicator in the same direction in which the pre-polymeric material is applied from the distal portion of the applicator.

8. A method as in claim 4, wherein the step of applying actinic light involves applying actinic light to a tissue surface in a pattern at least as large as a dispersion pattern in which the pre-polymeric material is applied to the tissue surface.

9. A method as in claim 4, wherein, following the step of applying pre-polymeric material to the tissue surface in a first pattern, the method involves applying actinic light to the tissue surface in a pattern that is substantially the same shape as that of the first pattern.

10. A method as in claim 4, further comprising allowing a controller that automatically operates the emitter of actinic light to activate the actinic light following the step of applying the pre-polymeric material to the tissue.

11. A method as in claim 1, further comprising inserting the applicator, percutaneously, into the body of a mammal.

12. A method as in claim 1, further comprising inserting the applicator via an incision into a mammal.

13. A method as in claim 1, further comprising inserting the applicator via a natural orifice into a mammal.