Figure 34 is a perspective cutaway view of a section of antenna cradle 2374 along I-I in Figure 31. According to one embodiment of the invention antenna cradle 2374 may include cradle circuit 2385. According to one embodiment of the invention cradle circuit 2385 may include cradle reservoir 2387 and cradle channels 2389.

Figure 35 is a perspective view of antenna array 2355 according to one embodiment of the invention. According to one embodiment of the invention, antenna cradle 2374 may include reservoir inlet 2384 and antenna chamber 2377. According to one embodiment of the invention waveguide assembly 2358 may include one or more isolation elements 2391 (which may be, for example, ECCOSORB MF-190 microwave absorber material, available from Emerson & Cuming Microwave Products) positioned between waveguide antennas 2364. According to one embodiment of the invention microwave energy may be supplied to each waveguide antenna through feed connectors 2388. According to one embodiment of the invention waveguide assembly 2358 may be held together by a waveguide assembly frame 2353. According to one embodiment of the invention waveguide assembly frame 2353 may include feed brackets 2351 and assembly bolts 2349. According to one embodiment of the invention antenna array 2355 may include an antenna cradle and ~~lease~~ one waveguide antenna 2364. According to one embodiment of the invention antenna array 2355 may include one or more isolation elements 2391. According to one embodiment of the invention antenna array 2355 may include four waveguide antennas 2364. According to one embodiment of the invention the heights of waveguide antennas 2364 in antenna array 2355 may be staggered to facilitate access to feed connectors 2388.

Figure 36 is a cutaway view of antenna array

waveguide assembly 2358 may include one or more waveguide antennas 2364(a-d) and one or more isolation elements 2391. According to one embodiment of the invention isolation elements 2391 may be positioned between waveguide antennas 2364 and on either side of waveguide assembly 2358. According to one embodiment of the invention coolant chamber 2360, which may also be referred to as heat exchange channels, may be adapted to receive cooling fluid (not shown).

Figure 38 ~~is a~~ is a perspective view of a second section of the cutaway view of antenna array 2355 illustrated in Figure 36. According to one embodiment of the invention waveguide assembly 2358 may include one or more waveguide antennas 2364(b-d) and one or more isolation elements 2391. According to one embodiment of the invention waveguide antennas 2364 may include a dielectric filler 2368 and waveguide walls 2366. According to one embodiment of the invention coolant chamber 2360, which may also be referred to as heat exchange channels, may be adapted to receive cooling fluid (not shown).

Figure 39 ~~is a~~ is a view of a third section of the cutaway view of antenna array 2355 illustrated in Figure 36. According to one embodiment of the invention coolant chamber 2360, which may also be referred to as heat exchange channels, may be adapted to receive cooling fluid (not shown). According to one embodiment of the invention separation ribs 2393 may be supported by rib holder 2396. According to one embodiment of the invention scattering element 2378 may be designed, positioned and dimensioned to spread the power loss density pattern (or SAR pattern created in tissue engaged in tissue chamber 2388. According to one embodiment of the invention scattering element 2378 may be formed of the same material as dielectric filler 2368. According

to one embodiment of the invention scattering element 2378 may be a low loss dielectric material having a dielectric constant of approximately 10. According to one embodiment of the invention scattering element 2378 may be a low loss dielectric material with a dielectric constant approximately equal to the dielectric constant of filler material 2368. According to one embodiment of the invention scattering element 2378 preferably has a dielectric constant different from the dielectric constant of the cooling fluid. According to one embodiment of the invention scattering element 2378 is preferably low loss such that it does not attenuate or dissipate energy emitted from the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a loss of less than approximately 1 at the frequency of interest, such as, for example 5.8 GHz. According to one embodiment of the invention scattering element 2378 with a low loss cooling fluid it may be preferable to have a higher loss scattering element to spread the effective field size (EFS) which may be defined as the ~~ration~~ between the fifty percent SAR contour in a cross section of target tissue and a radiating aperture of the antenna). According to one embodiment of the invention scattering element 2378 may be formed of alumina or Eccostock material. According to one embodiment of the invention scattering element 2378 may be shaped to facilitate laminar flow of coolant around scattering element 2378. According to one embodiment of the invention scattering element 2378 may be shaped to minimize the creation of air bubbles in coolant flowing through cooling chamber 2360. According to one embodiment of the invention scattering element 2378 may be shaped and positioned to optimize the cooling and microwave characteristics of the system. According to one embodiment of the invention

scattering element 2378 may be shaped and positioned to ~~minimizing~~ the area of the cooling plate covered by scattering element 2378. According to one embodiment of the invention scattering element 2378 may be shaped and positioned to maximizing the cross-sectional area of peak SAR within the target region at the target depth in tissue engaged by tissue chamber 2338.

According to one embodiment of the invention scattering element 2378 may be located in the center of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may be rectangular, having dimensions proportional to the dimensions of an aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may be oblong. According to one embodiment of the invention scattering element 2378 may be racetrack shaped with elongated sides parallel to the longest sides of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a length of between approximately 1 millimeter and a length of approximately 7 millimeters. According to one embodiment of the invention scattering element 2378 may have a length of approximately as long as the long side of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a width of between approximately 1 millimeter and approximately 4 millimeters. According to one embodiment of the invention scattering element 2378 may have a width as long as the short side of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a height of approximately one-half millimeter. According to one embodiment of the invention scattering element 2378 may have a height approximately equal to the depth of the coolant chamber 2360. According to one

ensuring appropriate contact between center insulator 2398 and dielectric filler 2368.

According to one embodiment of the invention isolation elements 2391 may be designed to isolate the interactions between waveguide antennas 2364 and to balance the loading conditions seen by inner waveguide antennas (such as, for example waveguide antennas 2364a and 2364d) and outer waveguide antennas (such as, for example waveguide antennas 2364b and 2364c). According to one embodiment of the invention isolation elements 2391 may absorb a portion of the microwave energy which is not coupled into tissue engaged by tissue chamber 2338. According to one embodiment of the invention isolation elements 2391 may absorb fringing fields present ~~a~~ the metallic edges of an aperture of waveguide antenna 2364. According to one embodiment of the invention isolation elements 2391 may be designed and positioned to ensure that each waveguide antenna 2364 sees the same loading characteristics on each side of the waveguide antenna 2364.

According to one embodiment of the invention, such as the embodiment illustrated in Figure 13, the need for isolation elements 2391 may be eliminated where the outer conductive walls of waveguide antennas 2364 are machined to ensure that the width of conductive material (such as, for example, waveguide walls 2366) between the dielectric fillers 2368 of adjacent waveguide antennas 2364 may be the same for all waveguide antennas 2364 in antenna array 2355. According to one embodiment of the invention waveguide walls 2366 of the outer waveguide antennas 2364a and 2364d may be machined such that such wave guide walls 2366 are as thick as the distance between adjacent waveguide antennas 2364 in antenna array 2355. According to one embodiment of the invention waveguide antennas 2364 may be carefully constructed such

~~bandwith~~ of approximately 25 MHz. According to one embodiment of the invention amplifier 2306 may be an amplifier adapted to amplify signals at the frequency of interest. According to one embodiment of the invention amplifier 2306 may be an amplifier adapted to amplify signals at 5.8 GHz. According to one embodiment of the invention amplifier 2306 may be an S51500-05 amplifier available from Locus Microwave. According to one embodiment of the invention amplifier 2306 may include internal biasing circuitry, matching circuitry and control circuitry adapted to maintain the stability and provide appropriate matching and power output at the frequency of interest. According to one embodiment of the invention amplifier 2306 may be adapted to amplify incoming signals by 54 dB. According to one embodiment of the invention isolator 2401b may be used to protect amplifier 2306 from reflected power signals. According to one embodiment of the invention energy cable 2322 may carry the microwave energy out from directional coupler 2406 out of microwave chain 2403. According to one embodiment of the invention directional coupler 2406 may further be connected to attenuator 2408b which may ~~be connected~~ be connected to power detector 2409b. According to one embodiment of the invention an output of power detector 2409b may be forward power signal 2415. According to one embodiment of the invention directional coupler 2406 may further be connected to attenuator 2408c which may which may be connected to power detector 2409a. According to one embodiment of the invention a pair of power detectors 2409b and 2409a may be used to measure forward and reverse power. According to one embodiment of the invention an output of attenuator 2409a may be reverse power signal 2417. According to one embodiment of the invention microwave chain 2403 may be connected to microwave control signals 2413. According to one

embodiment of the invention microwave control signals 2413 may include PWM control signal 2405, fault signal 2407, mute signal 2411, forward power signal 2415 and reverse power signal 2417. According to one embodiment of the invention PWM control signal 2405 may be connected to switch 2402. According to one embodiment of the invention fault signal 2407 may be generated by amplifier 2306. According to one embodiment of the invention mute signal 2411 may be connected to amplifier 2306. According to one embodiment of the invention power detectors 2409 may be, for example, a coaxial tunnel diode detector.

According to one embodiment of the invention power control works by comparing forward power signal 2415 measured at directional coupler 2406 to the requested power from power control knob 2454. According to one embodiment of the invention power may be sampled from the output of amplifier 2306 by directional coupler 2406 which is connected to power detector 2409b. According to one embodiment of the invention directional coupler 2406 may be used to route forward and reflected power to power detectors 2409a and 2409b (which may be, for example, coaxial tunnel diode detectors). According to one embodiment of the invention the output of power detectors 2409a and 2409b may be read by converter circuitry in controller 2302 and fed back to switch 2402 which controls the input to amplifier 2306. According to one embodiment of the invention the duty cycle of switch 2402 may control the output power level from microwave chain 2403 with the percent time on of switch 2402 proportional to the percent of max output power generated from microwave chain 2403. According to one embodiment of the invention a microwave chain with a 100 watt maximum output ~~would~~ may ~~provied~~ a 40 watt output from microwave chain 2403 when switch 2402 is driven at a 40%

tissue structures and groups of tissue structures which cross and interrupt tissue interface 1308. As illustrated in Figures 61 through 64, hypodermis 1303 lies over muscle tissue 1301. According to one embodiment of the invention electromagnetic radiation may be radiated at a frequency of, for example, between 5 and 6.5 GHz. According to one embodiment of the invention electromagnetic radiation may be radiated at a frequency of, for example, approximately 5.8 GHz. According to one embodiment of the invention field spreader 2379 (which may be, for example a scattering element 2378) may be located in coolant chamber 360. In embodiments of the invention, such as, for example, the embodiment illustrated in Figure 64 field spreader 2379 may be used to, for example, spread and flatten first tissue region 1309. In the embodiment of the invention illustrated in Figure 64 field spreader ~~379~~ may be used to, for example, spread and flatten lesions formed in first tissue region 1309. According to one embodiment of the invention the creation of lesions, such as, for example, the lesions illustrated in Figures 61 through 64 may be used to treat the skin of patients. According to one embodiment of the invention the creation of lesions, such as, for example, the lesions illustrated in Figures 61 through 64 may be used to damage or destroy structures, such as, for example, sweat glands in the skin of a patient.

According to one embodiment of the invention disposable 2363 includes a number of advantageous features. According to one embodiment of the invention vacuum pressure may be evenly distributed to either side of tissue bio-barrier 2337. According to one embodiment of the invention vacuum pressure may be evenly distributed to tissue chamber 2338 and the applicator chamber 2346 when equilibrium is achieved. According to one embodiment of the invention use of a stretchable

Claims:

1. A disposable medical apparatus for use with an applicator which radiates microwave energy, said disposable medical apparatus comprising:

a tissue chamber at a distal end of said disposable medical apparatus, a distal end of said tissue chamber being adapted to form a vacuum seal when positioned against skin;

an applicator chamber at a proximal end of said disposable ~~member~~;

a flexible film forming a tissue bio-barrier, said tissue bio-barrier separating said tissue chamber and said applicator chamber, said tissue bio-barrier being a material which is substantially transparent to microwave energy, and substantially impermeable to air and biological fluids;

a filter forming an applicator bio-barrier separating air in said tissue chamber from air in said applicator chamber, said applicator bio-barrier being substantially permeable to air but substantially impermeable to biological fluids;

a vacuum circuit connecting said tissue chamber and said applicator chamber, wherein said applicator bio-barrier is positioned in said vacuum circuit; and

a vacuum seal disposed on said applicator chamber, said vacuum seal being positioned to engage the applicator and seal said applicator chamber when said applicator is positioned in said applicator chamber.

2. A disposable medical apparatus according to claim 1, wherein said tissue bio-barrier does not perturb microwave fields passing through said tissue bio-barrier.

3. A disposable medical apparatus according to claim ~~3~~, wherein said frequency of interest is between approximately 5 GHz and 6.5 GHz.

4. A disposable medical apparatus according to claim 1, wherein said tissue bio-barrier has a Young's modulus of between approximately 0.1 GPa and 1.5 GPa.

5. A disposable medical apparatus according to claim 1, wherein said vacuum circuit provides a substantially free flow of air from said applicator chamber to said tissue chamber.

Figure 34 is a perspective cutaway view of a section of antenna cradle 2374 along I-I in Figure 31. According to one embodiment of the invention antenna cradle 2374 may include cradle circuit 2385. According to one embodiment of the invention cradle circuit 2385 may include cradle reservoir 2387 and cradle channels 2389.

Figure 35 is a perspective view of antenna array 2355 according to one embodiment of the invention. According to one embodiment of the invention, antenna cradle 2374 may include reservoir inlet 2384 and antenna chamber 2377. According to one embodiment of the invention waveguide assembly 2358 may include one or more isolation elements 2391 (which may be, for example, ECCOSORB MF-190 microwave absorber material, available from Emerson & Cuming Microwave Products) positioned between waveguide antennas 2364. According to one embodiment of the invention microwave energy may be supplied to each waveguide antenna through feed connectors 2388. According to one embodiment of the invention waveguide assembly 2358 may be held together by a waveguide assembly frame 2353. According to one embodiment of the invention waveguide assembly frame 2353 may include feed brackets 2351 and assembly bolts 2349. According to one embodiment of the invention antenna array 2355 may include an antenna cradle and at least one waveguide antenna 2364. According to one embodiment of the invention antenna array 2355 may include one or more isolation elements 2391. According to one embodiment of the invention antenna array 2355 may include four waveguide antennas 2364. According to one embodiment of the invention the heights of waveguide antennas 2364 in antenna array 2355 may be staggered to facilitate access to feed connectors 2388.

Figure 36 is a cutaway view of antenna array

to one embodiment of the invention scattering element 2378 may be a low loss dielectric material having a dielectric constant of approximately 10. According to one embodiment of the invention scattering element 2378 may be a low loss dielectric material with a dielectric constant approximately equal to the dielectric constant of filler material 2368. According to one embodiment of the invention scattering element 2378 preferably has a dielectric constant different from the dielectric constant of the cooling fluid. According to one embodiment of the invention scattering element 2378 is preferably low loss such that it does not attenuate or dissipate energy emitted from the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a loss of less than approximately 1 at the frequency of interest, such as, for example 5.8 GHz. According to one embodiment of the invention scattering element 2378 with a low loss cooling fluid it may be preferable to have a higher loss scattering element to spread the effective field size (EFS) which may be defined as the ratio between the fifty percent SAR contour in a cross section of target tissue and a radiating aperture of the antenna). According to one embodiment of the invention scattering element 2378 may be formed of alumina or Eccostock material. According to one embodiment of the invention scattering element 2378 may be shaped to facilitate laminar flow of coolant around scattering element 2378. According to one embodiment of the invention scattering element 2378 may be shaped to minimize the creation of air bubbles in coolant flowing through cooling chamber 2360. According to one embodiment of the invention scattering element 2378 may be shaped and positioned to optimize the cooling and microwave characteristics of the system. According to one embodiment of the invention

scattering element 2378 may be shaped and positioned to minimize the area of the cooling plate covered by scattering element 2378. According to one embodiment of the invention scattering element 2378 may be shaped and positioned to maximizing the cross-sectional area of peak SAR within the target region at the target depth in tissue engaged by tissue chamber 2338.

According to one embodiment of the invention scattering element 2378 may be located in the center of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may be rectangular, having dimensions proportional to the dimensions of an aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may be oblong. According to one embodiment of the invention scattering element 2378 may be racetrack shaped with elongated sides parallel to the longest sides of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a length of between approximately 1 millimeter and a length of approximately 7 millimeters. According to one embodiment of the invention scattering element 2378 may have a length of approximately as long as the long side of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a width of between approximately 1 millimeter and approximately 4 millimeters. According to one embodiment of the invention scattering element 2378 may have a width as long as the short side of the aperture of waveguide antenna 2364. According to one embodiment of the invention scattering element 2378 may have a height of approximately one-half millimeter. According to one embodiment of the invention scattering element 2378 may have a height approximately equal to the depth of the coolant chamber 2360. According to one

embodiment of the invention scattering element 2378 may have an area which is proportional to the area of the aperture of waveguide antenna 2364.

According to one embodiment of the invention scattering element 2378 may be positioned between dielectric filler 2368 of waveguide antenna 2364 and a proximal side of cooling plate 2340. According to one embodiment of the invention scattering element 2378 may be positioned to contact both dielectric filler 2368 and a proximal surface of cooling plate 2340. According to one embodiment of the invention scattering element 2378 may be positioned against cooling plate 2340 in a manner which minimizes or eliminates air gaps or other discontinuities at the junction between scattering element 2378 and cooling plate 2340. According to one embodiment of the invention scattering element 2378 may be attached to the cooling plate using for example a dielectric epoxy. According to one embodiment of the invention scattering element 2378 may be positioned such that fields generated by waveguide antenna 2364 do not re-converge while propagating through cooling plate 2340. According to one embodiment of the invention scattering element 2378 may be positioned in the center of the coolant chamber 2360, with equal flow paths on either side of scattering element 2378. According to one embodiment of the invention scattering element 2378 may be oriented such that the longest dimension of scattering element 2378 is aligned along the path taken by cooling fluid through coolant chamber 2360. According to one embodiment of the invention scattering element 2378 may be positioned in the center of the region of maximum E-field strength radiated by waveguide antenna 2364.

Figure 40 is an end view of the antenna array 2355, coolant chambers 2360, separation ribs 2393 and scattering elements 2378 according to one embodiment of

ensuring appropriate contact between center insulator 2398 and dielectric filler 2368.

According to one embodiment of the invention isolation elements 2391 may be designed to isolate the interactions between waveguide antennas 2364 and to balance the loading conditions seen by inner waveguide antennas (such as, for example waveguide antennas 2364a and 2364d) and outer waveguide antennas (such as, for example waveguide antennas 2364b and 2364c). According to one embodiment of the invention isolation elements 2391 may absorb a portion of the microwave energy which is not coupled into tissue engaged by tissue chamber 2338. According to one embodiment of the invention isolation elements 2391 may absorb fringing fields present at the metallic edges of an aperture of waveguide antenna 2364. According to one embodiment of the invention isolation elements 2391 may be designed and positioned to ensure that each waveguide antenna 2364 sees the same loading characteristics on each side of the waveguide antenna 2364.

According to one embodiment of the invention, such as the embodiment illustrated in Figure 13, the need for isolation elements 2391 may be eliminated where the outer conductive walls of waveguide antennas 2364 are machined to ensure that the width of conductive material (such as, for example, waveguide walls 2366) between the dielectric fillers 2368 of adjacent waveguide antennas 2364 may be the same for all waveguide antennas 2364 in antenna array 2355. According to one embodiment of the invention waveguide walls 2366 of the outer waveguide antennas 2364a and 2364d may be machined such that such wave guide walls 2366 are as thick as the distance between adjacent waveguide antennas 2364 in antenna array 2355. According to one embodiment of the invention waveguide antennas 2364 may be carefully constructed such

bandwidth of approximately 25 MHz. According to one embodiment of the invention amplifier 2306 may be an amplifier adapted to amplify signals at the frequency of interest. According to one embodiment of the invention amplifier 2306 may be an amplifier adapted to amplify signals at 5.8 GHz. According to one embodiment of the invention amplifier 2306 may be an S51500-05 amplifier available from Locus Microwave. According to one embodiment of the invention amplifier 2306 may include internal biasing circuitry, matching circuitry and control circuitry adapted to maintain the stability and provide appropriate matching and power output at the frequency of interest. According to one embodiment of the invention amplifier 2306 may be adapted to amplify incoming signals by 54 dB. According to one embodiment of the invention isolator 2401b may be used to protect amplifier 2306 from reflected power signals. According to one embodiment of the invention energy cable 2322 may carry the microwave energy out from directional coupler 2406 out of microwave chain 2403. According to one embodiment of the invention directional coupler 2406 may further be connected to attenuator 2408b which may be connected to power detector 2409b. According to one embodiment of the invention an output of power detector 2409b may be forward power signal 2415. According to one embodiment of the invention directional coupler 2406 may further be connected to attenuator 2408c which may which may be connected to power detector 2409a. According to one embodiment of the invention a pair of power detectors 2409b and 2409a may be used to measure forward and reverse power. According to one embodiment of the invention an output of attenuator 2409a may be reverse power signal 2417. According to one embodiment of the invention microwave chain 2403 may be connected to microwave control signals 2413. According to one

embodiment of the invention microwave control signals 2413 may include PWM control signal 2405, fault signal 2407, mute signal 2411, forward power signal 2415 and reverse power signal 2417. According to one embodiment of the invention PWM control signal 2405 may be connected to switch 2402. According to one embodiment of the invention fault signal 2407 may be generated by amplifier 2306. According to one embodiment of the invention mute signal 2411 may be connected to amplifier 2306. According to one embodiment of the invention power detectors 2409 may be, for example, a coaxial tunnel diode detector.

According to one embodiment of the invention power control works by comparing forward power signal 2415 measured at directional coupler 2406 to the requested power from power control knob 2454. According to one embodiment of the invention power may be sampled from the output of amplifier 2306 by directional coupler 2406 which is connected to power detector 2409b. According to one embodiment of the invention directional coupler 2406 may be used to route forward and reflected power to power detectors 2409a and 2409b (which may be, for example, coaxial tunnel diode detectors). According to one embodiment of the invention the output of power detectors 2409a and 2409b may be read by converter circuitry in controller 2302 and fed back to switch 2402 which controls the input to amplifier 2306. According to one embodiment of the invention the duty cycle of switch 2402 may control the output power level from microwave chain 2403 with the percent time on of switch 2402 proportional to the percent of max output power generated from microwave chain 2403. According to one embodiment of the invention a microwave chain with a 100 watt maximum output may provide a 40 watt output from microwave chain 2403 when switch 2402 is driven at a 40%

tissue structures and groups of tissue structures which cross and interrupt tissue interface 1308. As illustrated in Figures 61 through 64, hypodermis 1303 lies over muscle tissue 1301. According to one embodiment of the invention electromagnetic radiation may be radiated at a frequency of, for example, between 5 and 6.5 GHz. According to one embodiment of the invention electromagnetic radiation may be radiated at a frequency of, for example, approximately 5.8 GHz. According to one embodiment of the invention field spreader 2379 (which may be, for example a scattering element 2378) may be located in coolant chamber 360. In embodiments of the invention, such as, for example, the embodiment illustrated in Figure 64 field spreader 2379 may be used to, for example, spread and flatten first tissue region 1309. In the embodiment of the invention illustrated in Figure 64 field spreader 2379 may be used to, for example, spread and flatten lesions formed in first tissue region 1309. According to one embodiment of the invention the creation of lesions, such as, for example, the lesions illustrated in Figures 61 through 64 may be used to treat the skin of patients. According to one embodiment of the invention the creation of lesions, such as, for example, the lesions illustrated in Figures 61 through 64 may be used to damage or destroy structures, such as, for example, sweat glands in the skin of a patient.

According to one embodiment of the invention disposable 2363 includes a number of advantageous features. According to one embodiment of the invention vacuum pressure may be evenly distributed to either side of tissue bio-barrier 2337. According to one embodiment of the invention vacuum pressure may be evenly distributed to tissue chamber 2338 and the applicator chamber 2346 when equilibrium is achieved. According to one embodiment of the invention use of a stretchable

Claims:

1. A disposable medical apparatus for use with an applicator which radiates microwave energy, said disposable medical apparatus comprising:

a tissue chamber at a distal end of said disposable medical apparatus, a distal end of said tissue chamber being adapted to form a vacuum seal when positioned against skin;

an applicator chamber at a proximal end of said disposable medical apparatus;

a flexible film forming a tissue bio-barrier, said tissue bio-barrier separating said tissue chamber and said applicator chamber, said tissue bio-barrier being a material which is substantially transparent to microwave energy, and substantially impermeable to air and biological fluids;

a filter forming an applicator bio-barrier separating air in said tissue chamber from air in said applicator chamber, said applicator bio-barrier being substantially permeable to air but substantially impermeable to biological fluids;

a vacuum circuit connecting said tissue chamber and said applicator chamber, wherein said applicator bio-barrier is positioned in said vacuum circuit; and

a vacuum seal disposed on said applicator chamber, said vacuum seal being positioned to engage the applicator and seal said applicator chamber when said applicator is positioned in said applicator chamber.

2. A disposable medical apparatus according to claim 1, wherein said tissue bio-barrier does not perturb microwave fields passing through said tissue bio-barrier.

3. A disposable medical apparatus according to claim 1, wherein said frequency of interest is between approximately 5 GHz and 6.5 GHz.

4. A disposable medical apparatus according to claim 1, wherein said tissue bio-barrier has a Young's modulus of between approximately 0.1 GPa and 1.5 GPa.

5. A disposable medical apparatus according to claim 1, wherein said vacuum circuit provides a substantially free flow of air from said applicator chamber to said tissue chamber.