

CLAIMS

1. An electrosurgical generator arranged to generate
5 radiofrequency (RF) electromagnetic (EM) energy and microwave
frequency EM energy;
wherein the electrosurgical generator is operable in each
of a coagulation mode and a cutting mode,
wherein in the coagulation mode the electrosurgical
10 generator is arranged to deliver the RF EM energy and the
microwave EM energy simultaneously in a coagulation composite
waveform comprising a dominant microwave signal and a
supplementary RF signal, and
wherein in the cutting mode the electrosurgical generator
15 is arranged to deliver the RF EM energy and the microwave EM
energy simultaneously in a cutting composite waveform
comprising a dominant RF signal and a supplementary microwave
signal.
- 20 2. An electrosurgical apparatus according to claim 1,
wherein in the coagulation composite waveform the
supplementary RF signal is delivered at a low power level
which is suitable to result in localised heating of biological
tissue but which is not suitable for generating microplasmas.
- 25 3. An electrosurgical apparatus according to claim 1,
wherein in the coagulation composition waveform the dominant
microwave signal is delivered at a high power level which is
suitable to promote coagulation of biological tissue.
- 30 4. An electrosurgical apparatus according to any one of
the preceding claims, wherein in the coagulation composite
waveform the dominant microwave signal is delivered at a power
level of 10 W or less.
- 35 5. An electrosurgical apparatus according to any one of
the preceding claims, wherein in the coagulation composite
waveform the dominant microwave signal is delivered as a
continuous wave signal.
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6. An electrosurgical apparatus according to any one of the preceding claims, wherein in the coagulation composite waveform the supplementary RF signal is delivered having a RMS voltage in the range of 75 to 100 V

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7. An electrosurgical apparatus according to any one of the preceding claims, wherein in the coagulation composite waveform the supplementary RF signal is delivered as a continuous wave signal, or as a pulsed signal.

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8. An electrosurgical apparatus according to any one of the preceding claims, wherein in the cutting composite waveform the dominant RF signal is delivered at a high power level which is suitable for generating microplasmas for cutting tissue.

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9. An electrosurgical apparatus according to any one of the preceding claims, wherein in the cutting composite waveform the supplementary microwave signal is delivered at a low power level which is suitable for denaturing and desiccating biological tissue, but which is not suitable for coagulating biological tissue.

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10. An electrosurgical apparatus according to any one of the preceding claims, wherein in the cutting composite waveform the dominant RF signal is delivered having an RMS voltage of at least 300 V.

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11. An electrosurgical apparatus according to any one of the preceding claims, wherein in the cutting composite waveform the dominant RF signal is delivered as a continuous wave signal, or as a pulsed signal.

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12. An electrosurgical apparatus according to any one of the preceding claims, wherein in the cutting composite waveform the supplementary microwave signal is delivered at a power level of 10 W or less.

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13. An electrosurgical apparatus according to any one of the preceding claims, wherein in the cutting composite

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waveform the supplementary microwave signal is delivered as a continuous wave signal, or as a pulsed signal.

14. An electrosurgical apparatus comprising:

- 5 an electrosurgical generator according to any one of claims 1 to 11;
 an electrosurgical instrument having a distal tip assembly for delivering RF EM energy and microwave frequency EM energy into biological tissue; and
10 a feed cable connected to deliver the RF EM energy and the microwave frequency EM energy from the electrosurgical generator to the electrosurgical instrument.

15 15. A method of delivering radiofrequency (RF) electromagnetic (EM) energy and microwave frequency EM energy from an electrosurgical generator to an electrosurgical instrument that has a distal tip assembly for delivering RF EM energy and microwave frequency EM energy into biological tissue, the method comprising operating the generator to
20 deliver the RF EM energy and the microwave frequency EM energy simultaneously in either of a coagulation composite waveform for promoting haemostasis in biological tissue or a cutting composite waveform for cutting biological tissue, wherein:

- the coagulation composite waveform comprises a dominant
25 microwave signal and a supplementary RF signal which are delivered simultaneously, and
 the cutting composite waveform comprises a dominant RF signal and a supplementary microwave signal which are delivered simultaneously.

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