CLAIMS

1. A device for implementing a method for electromagnetic stimulation of a tissue, wherein the method comprises the steps of:

a) disposing an arrangement of electromagnetic transducers encompassing a volume containing a tissue; and

b) applying an electromagnetic field stimulus to a tissue through the arrangement of electromagnetic transducers according to an activation pattern for a determined period of time;

wherein the activation pattern varies the intensity and direction of an electromagnetic field vector produced by the arrangement of electromagnetic transducers in a three-dimensional space,

wherein step (b) is executed in a computing unit and the activation pattern follows the steps of:

A) defining a magnetic transducers index and a maximum number of magnetic transducers;

B) selecting a magnetic field transducer from the arrangement of electromagnetic transducers simultaneously in a position defined for the magnetic field transducers index of step (A);

C) activating the magnetic transducer selected in step (B) for a determined period of time and going to step (D);

D) deactivating the magnetic transducer selected in step (B) and going to step (E);

E) increasing a magnetic transducers index and comparing the magnetic transducers index with the maximum number of magnetic transducers,

- if the magnetic transducers index is greater than the maximum number of magnetic transducers, make the magnetic transducers index equal to the value defined in step (A) and returning to step (B);

- if the magnetic transducers index is less than or equal to the maximum number of magnetic transducers, return to step (B).

2. The device of Claim 1, wherein, after step (b), there is a step of changing the activation pattern and returning to step (b).

3. The device of Claim 2, wherein, changing the activation pattern is executed on the basis of a measurement of intensity of the electromagnetic field produced by the arrangement of electromagnetic transducers, on a tissue impedance response feedback or a combination of these.

4. The device of Claim 1, wherein, at step (a), the arrangement of electromagnetic transducers is a unitary arrangement of magnetic field transducers.

5. The device of Claim 1, wherein, at step (a), an active face of each electromagnetic transducer of the arrangement of electromagnetic transducers is spaced apart from an external surface of the tissue.

6. The device of Claim 1, wherein, at step (a), an active face of one of the electromagnetic transducers in the arrangement of electromagnetic transducers is spaced apart from an external surface of the tissue.

7. A device for implementing a method for electromagnetic stimulation of a tissue, the method comprising the steps of:

a) disposing an arrangement of electromagnetic transducers encompassing a volume containing a tissue; and

b) applying an electromagnetic field stimulus to a tissue through the arrangement of electromagnetic transducers according to an activation pattern for a determined period of time;

wherein the activation pattern varies the intensity and direction of an electromagnetic field vector produced by the arrangement of electromagnetic transducers in a three-dimensional space;

wherein, step (b) is executed in a computing unit and the activation pattern follows the steps of:

A) defining an electrical field transducers index with an initial value and a maximum number of pairs of electrical field transducers in the computing unit;

B) selecting a pair of electrical field transducers from the arrangement of electromagnetic transducers simultaneously in a position defined for the electrical field transducers index of step (A);

C) activating the pair of electrical field transducers selected in step (B) with a determined polarity such that an electrical field transducer of said pair has positive electrical potential in relation to the other electric field transducer of said pair, during a determined period of time;

E) deactivating the pair of electrical field transducers selected in step (B);

F) increasing an index for electrical field transducers and comparing the electrical field transducers index with the maximum number of pairs of electrical field transducers,

- if the electrical field transducers index is greater than the maximum number of pairs of electrical field transducers, making the index for the electrical field transducers equal to the value defined in step (A) and returning to step (B);

- if the index of the electrical field transducers is less than or equal to the maximum number of pairs of electrical field transducers, return to step (B);

wherein the arrangement of electromagnetic transducers has “n” pairs of electrical field transducers with “n” being a natural number greater than two.

8. A device for implementing a method for electromagnetic stimulation of a tissue, the method comprising the steps of:

a) disposing an arrangement of electromagnetic transducers encompassing a volume containing a tissue; and

b) applying an electromagnetic field stimulus to the tissue through the arrangement of electromagnetic transducers according to an activation pattern for a determined period of time;

wherein the activation pattern varies the intensity and direction of an electromagnetic field vector produced by the arrangement of electromagnetic transducers in a three-dimensional space,

wherein step (b) is executed in a computing unit and the activation pattern follows the steps of:

A) defining a magnetic transducers index and a maximum number of magnetic transducers;

B) selecting a magnetic field transducer from the arrangement of electromagnetic transducers simultaneously in a position defined for the magnetic field transducers index of step (A);

C) activating the magnetic transducer selected in step (B) for a determined period of time and going to step (D);

D) deactivating the magnetic transducer selected in step (B) and going to step (E);

E) increasing a magnetic transducers index and comparing the magnetic transducers index with the maximum number of magnetic transducers,

- if the magnetic transducers index is greater than the maximum number of magnetic transducers, make the magnetic transducers index equal to the value defined in step (A) and returning to step (B);

- if the magnetic transducers index is less than or equal to the maximum number of magnetic transducers, return to step (B):

wherein the electromagnetic field stimulus provides an intensity of either a magnetic field or an electrical field on the tissue, or the combination thereof, as follows:

the magnetic field generated by the arrangement of electromagnetic transducers is of between about 0.1 mT and about 200 mT; or

the electrical field generated by the arrangement of electromagnetic transducers is of between about 2 V/cm and about 5 V/cm.

9. The device of Claim 8, wherein, after step (b), there is a step of changing the activation pattern and returning to step (b).

10. The device of Claim 8, wherein, changing the activation pattern is executed on the basis of a measurement of intensity of the electromagnetic field produced by the arrangement of electromagnetic transducers, on a tissue impedance response feedback or a combination of these.

11. The device of Claim 8, wherein, at step (a), the arrangement of electromagnetic transducers is a unitary arrangement of magnetic field transducers.

12. The device of Claim 8, wherein, at step (a), an active face of each electromagnetic transducer of the arrangement of electromagnetic transducers is spaced apart from an external surface of the tissue.

13. The device of Claim 8, wherein, at step (a), an active face of one of the electromagnetic transducers in the arrangement of electromagnetic transducers is spaced apart from an external surface of the tissue.

14. A device for stimulating a tissue with electromagnetic fields, the device comprising:

- a computing unit;
- an external power source connected to the computing unit;
- a decoupling circuit connected to the external power source and to the computing unit;
- a switching circuit connected to the external power source, to the decoupling circuit and to the computing unit; and
- an arrangement of electromagnetic transducers connected to the computing unit and to the switching circuit;

wherein the computing unit implements a method for electromagnetic stimulation of a tissue, the method comprising the steps of: a) disposing an arrangement of electromagnetic transducers encompassing a volume containing a tissue; and b) applying an electromagnetic field stimulus to a tissue through the arrangement of electromagnetic transducers according to an activation pattern for a determined period of time;

wherein the activation pattern varies the intensity and direction of an electromagnetic field vector produced by the arrangement of electromagnetic transducers in a three-dimensional space;

wherein step (b) is executed in the computing unit and the activation pattern follows the steps of:

A) defining a magnetic transducers index and a maximum number of magnetic transducers;

B) selecting a magnetic field transducer from the arrangement of electromagnetic transducers simultaneously in a position defined for the magnetic field transducers index of step (A);

C) activating the magnetic transducer selected in step (B) for a determined period of time and going to step (D);

D) deactivating the magnetic transducer selected in step (B) and going to step (E);

E) increasing a magnetic transducers index and comparing the magnetic transducers index with the maximum number of magnetic transducers,

- if the magnetic transducers index is greater than the maximum number of magnetic transducers, make the magnetic transducers index equal to the value defined in step (A) and returning to step (B);

- if the magnetic transducers index is less than or equal to the maximum number of magnetic transducers, return to step (B).

15. A device for stimulating a tissue with electromagnetic fields, the device comprising:

- a computing unit;

- an external power source connected to the computing unit;

- a decoupling circuit connected to the external power source and to the computing unit;

- a switching circuit connected to the external power source, to the decoupling circuit and to the computing unit; and

- an arrangement of electromagnetic transducers connected to the computing unit and to the switching circuit;

wherein the computing unit implements a method for electromagnetic stimulation of a tissue, the method comprising the steps of: a) disposing an arrangement of electromagnetic transducers encompassing a volume containing a tissue; and b) applying an electromagnetic field stimulus to a tissue through the arrangement of electromagnetic transducers according to an activation pattern for a determined period of time;

wherein the activation pattern varies the intensity and direction of an electromagnetic field vector produced by the arrangement of electromagnetic transducers in a three-dimensional space;

wherein step (b) is executed in the computing unit and the activation pattern follows the steps of:

A) defining an electrical field transducers index with an initial value and a maximum number of pairs of electrical field transducers in the computing unit;

B) selecting a pair of electrical field transducers from the arrangement of electromagnetic transducers simultaneously in a position defined for the electrical field transducers index of step (A);

C) activating the pair of electrical field transducers selected in step (B) with a determined polarity such that an electrical field transducer of said pair has positive electrical potential in relation to the other electric field transducer of said pair, during a determined period of time;

E) deactivating the pair of electrical field transducers selected in step (B);

F) increasing an index for electrical field transducers and comparing the electrical field transducers index with the maximum number of pairs of electrical field transducers,

- if the electrical field transducers index is greater than the maximum number of pairs of electrical field transducers, making the index for the electrical field transducers equal to the value defined in step (A) and returning to step (B);
- if the index of the electrical field transducers is less than or equal to the maximum number of pairs of electrical field transducers, return to step (B);

wherein the arrangement of electromagnetic transducers has “n” pairs of electrical field transducers with “n” being a natural number greater than two.

16. The device of Claim 14, wherein the computing unit is a special purpose computing unit comprising a central processor unit (21a) connected to oscillators from a first oscillator, a second oscillator to an oscillator “n” each oscillator having an activation signal output; wherein “n” is a natural number equal or greater than cero.

17. The device of Claim 14, wherein the central processor unit is also connected to a peripheral device selected among others, from storage devices such as a memory unit, a database and a hard drive, input devices such as a keyboard, a camera, a touchscreen display, and a scanner, output devices such as a display, and a printer.