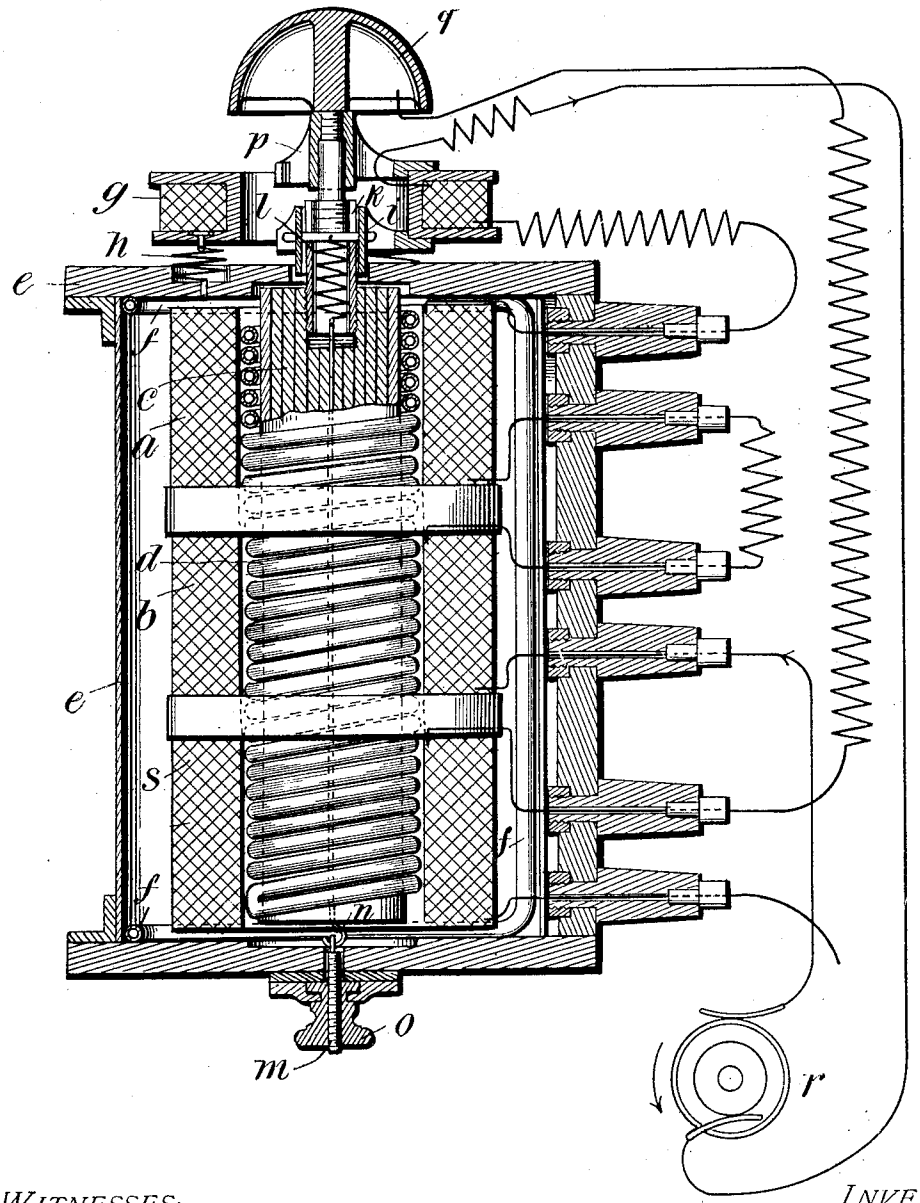
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E. K. MÜLLER.

ELECTROMAGNETIC DEVICE FOR VIBRATORY MASSAGE.

APPLICATION FILED SEPT. 20, 1902.

NO MODEL.



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No. 749,213. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

EUGEN KONRAD MÜLLER, OF ZURICH, SWITZERLAND.

ELECTROMAGNETIC DEVICE FOR VIBRATORY MASSAGE.

SPECIFICATION forming part of Letters Patent No. 749,213, dated January 12, 1904.

Application filed September 20, 1902. Serial No. 124,178. (No model.)

To all whom it may concern:

Be it known that I, EUGEN KONRAD MÜLLER, a citizen of Switzerland, residing at Zurich, in the Republic of Switzerland, (whose post-office address is Splügenstrasse 2,) have invented certain new and useful Improvements in Electromagnetic Devices for Vibratory Massage; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an electromagnetic device for vibratory massage comprising a body for effecting the massage oscillated directly through the variations in a pulsatory magnetic field excited by a pulsatory current and by means of which body current is simultaneously transmitted to the part treated.

The novel and peculiar feature of this device consists in the utilization of the variations of the pulsatory magnetic field, by which variations the body effecting the massage is oscillated, for inducing the electrization-current, the wave lengths of which correspond with those of the magnetic field by which the massage is effected—in other words, with the oscillating period of vibration of the massage body.

In the accompanying drawing a form of the invention is shown in axial section.

a and *b* are two windings inserted in the circuit, in series and composing a coil, in the interior of which is a core *c*, composed of thin plates of paramagnetic material (soft iron, nickel, cobalt, &c.) insulated from one another by sheets of paper and secured together. The windings *a* and *b* are inclosed in a casing *e*, on the one end of which a wire coil *g* is arranged, with which the current-conducting body *q* for performing the massage operation is connected. Surrounding the core *c* is a pipe *d*, consisting of a single continuous tube doubled upon itself in such manner as to prevent self-induction therein by neutralizing the eddy currents and serving as a conduit through which a refrigerating fluid may be passed in order to prevent undue heating of the core and the windings of the coil. A similar pipe *f* is interposed between the coil and the casing.

The coils *a*, *b*, and *g* are inserted in the usual manner in series in the outer circuit of a source of current *r*, with which a pulsating current can be produced, the circuiting or winding of the windings *a* and *b* in relation to one another being of such a kind that they mutually excite a magnetic field, the lines of force of which run in the contrary direction to those of the magnetic field excited by the coil *g*. From time to time when the two fields have attained their maximum intensity the coil *g*, and with it the massage-body *q*, is repelled from the casing *e*, and when both fields reach their minimum the coil *g*—in other words, the massage-body—is drawn in by the adjustable spiral spring *l*, whereby the massage-body is caused to oscillate.

Over the core *c* a third coil *s* is placed, one end of which is attached to the massage-body *q*, while the other end of the wire is connected either to earth or with some part of the body of the patient to be treated. When the coil *a b* is excited by means of the source of current *r*, an alternating current is induced in the coil *s* by the variations in the excited field, which sets the massage-body in oscillation. This current exercises a more or less deep tensional effect during the massage operation with the massage-body *q* on the part of the patient's body that is to be treated. The wave lengths of this electrization-current corresponds with those of the magnetic field by means of which the massage is effected—in other words, with the oscillation period of a vibration of the massage-body, a point of great therapeutic value in certain cases.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, the combination, with a source of pulsatory electricity, of a vibratory massage-body connected to one terminal of said source, and means for connecting the other terminal to the patient.

2. In a device of the character described, the combination, with a source of pulsatory electricity, of a vibratory massage-body connected

to one terminal of said source, and means for connecting the other terminal to the patient.

3. In a device of the character described, a vibratory massage-body connected with a source of alternating electric current whose circuit is completed through the patient and the pulsations of which current correspond to the period of vibration of the massage-body.

4. In a device of the character described, the combination, with a massage-body operated by a pulsatory electric current, of a coil inductively energized thereby, one terminal of the coil connected with the massage-body, and the other terminal adapted to be connected with the patient.

5. In a device of the character described, the combination, with a massage-body operated by an alternating electric current, of a coil inductively energized thereby, one terminal of the coil connected with the massage-body, and the other terminal adapted to be connected with the patient.

6. In a device of the character described, the combination, with a massage-body operated by a pulsatory electric current, of a coil inductively energized thereby, one terminal of the coil connected with the massage-body, and the other terminal adapted to be connected with the patient, the pulsations of the induced current corresponding to the period of vibration of the massage-body.

7. In a device of the character described, the combination, with a coil, a core, a massage-body movably mounted relative to the said coil, and a source of pulsatory electric current connected with the coil in such manner as to energize the same and thereby actuate the massage-body, of a generator-coil formed about the core, one terminal of the generator-coil connected with the massage-body, and the other terminal adapted to be connected with the patient.

8. In a device of the character described, the combination, with a coil, a laminated core, a second coil movably mounted relative to the first coil, a massage-body carried by the second coil, yielding means for actuating the second coil in one direction, and a source of pulsatory electric current connected with the two coils in such manner as to intermittently actuate the second coil in the opposite direction, of a third coil formed about the core in such manner as to be inductively energized thereby, a connection between one terminal of the third coil and the massage-body, and means for grounding the other terminal.

9. In a device of the character described, the combination, with a coil, a core, a second coil movably mounted relative to the first coil, a massage-body mounted on the second coil, the two coils adapted to be connected with a source of alternating electric current and so wound that their magnetic fluxes will be opposed, and yielding means connecting the two coils, of a third coil formed about the core in such manner as to be inductively energized thereby, one terminal of the third coil connected to the massage-body, and the other terminal adapted to be connected to the patient.

10. The combination, with a primary coil, and a secondary coil in inductive relation thereto, of a refrigerating-pipe arranged to cool said coils and doubled upon itself whereby eddy currents are neutralized.

11. The combination, with a primary coil, a secondary coil, and a core common to both coils, of a refrigerating-pipe arranged to cool the core and coils and doubled upon itself whereby eddy currents are neutralized.

12. In an electromagnetic device, the combination, with a coil adapted to be connected to a source of electric current, and a core within the coil, of a generator-coil formed about the core and adapted to be inductively energized thereby, and a refrigerating-pipe disposed between the core and coils.

13. In an electromagnetic device, the combination, with a coil adapted to be connected to a source of electric current, and a core within the coil, of a generator-coil formed about the core and adapted to be inductively energized thereby, and a refrigerating-pipe disposed between the core and coils and consisting of a continuous tube doubled upon itself.

14. In a device of the character described, the combination, with a coil composed of two windings arranged in series, a core composed of insulated sections, a hollow refrigerating-spiral disposed between the core and windings and consisting of a continuous pipe doubled upon itself, a second coil arranged upon and axially displaceable relative to the first coil, springs connecting the two coils, and a massage-body carried by the second coil, the two coils adapted to be connected to a source of alternating electric current and so wound that the magnetic fluxes of their respective windings will be opposed, of a generator-coil formed about the core and spiral in such manner as to be inductively energized by the core, one terminal of the generator-coil connected to the massage-body, and the other terminal adapted to be connected with the patient.

15. In a device of the character described, the combination, with a core composed of a plurality of windings arranged in series, a laminated core, a hollow refrigerating-spiral disposed about the core between the same and the windings and consisting of a continuous pipe doubled upon itself, a similar spiral surrounding the windings of the coil, a second coil mounted upon and axially displaceable relative to the first coil, a massage-body carried by the second coil, the two coils adapted to be connected to a source of alternating electric current and so wound that the lines of force of their magnetic fields are opposed whereby the movable coil will be intermit-

tently repelled, and adjustable yielding means for returning said second coil, of a generator-coil formed about the core and spiral in such manner as to be inductively energized by the core, one terminal of the generator-coil connected to the massage-body and the other terminal adapted to be connected to the patient.

In testimony whereof I affix my signature in presence of two witnesses.

EUGEN KONRAD MÜLLER.

Witnesses:
ADOLF FEDERER,
CONRAD GUTKNECHT.