Aug. 12, 1947. F. E. KNIPPER 2,425,621

VIBRATOR

Filed Oct. 24, 1944

Fig1.

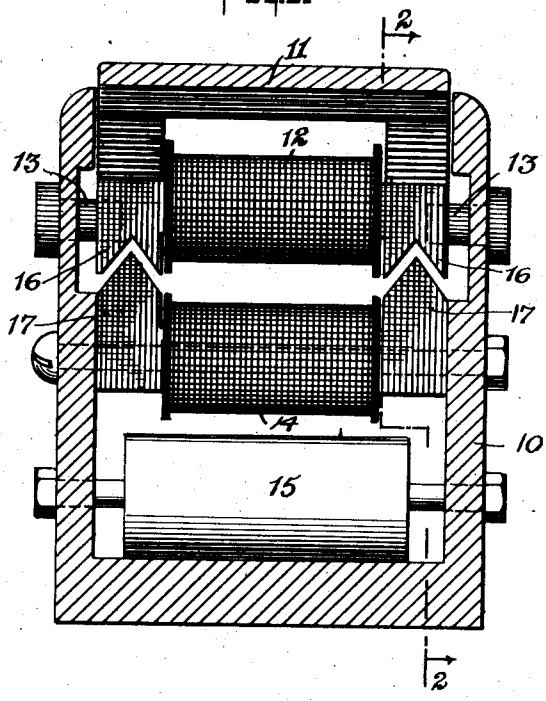



Fig2.

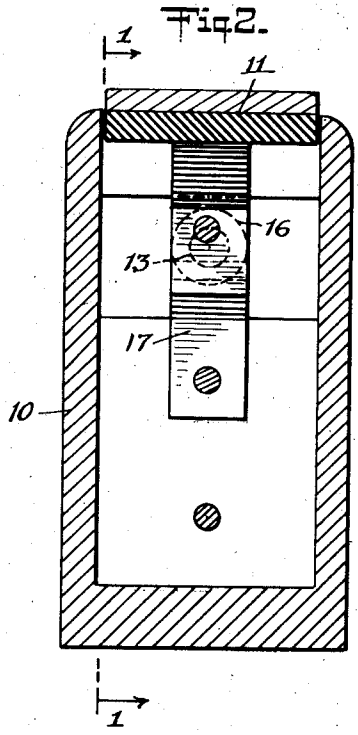
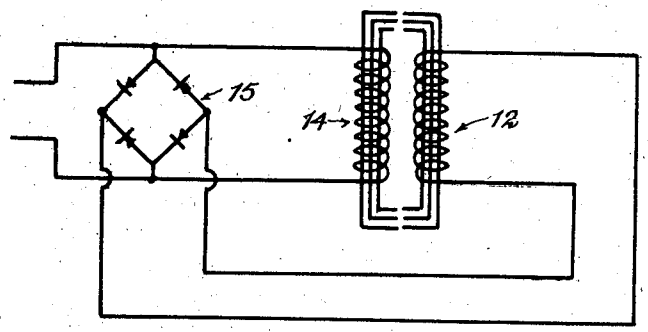



Fig3.




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# UNITED STATES PATENT OFFICE

2,425,621

## VIBRATOR

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1 Claim. (Cl. 172—240)

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The present invention relates to electric vibrators.

The principal object of the present invention is to provide an electric vibrator capable of effecting stronger and sharper vibrations than are produced by conventional vibrators.

The description which follows is directed to the specific application of the invention to a face massaging machine. This is not intended by way of limitation. The invention may be adapted for use in any type of vibrating machine without any departure from the basic principles thereof.

The basic feature of the present invention by which said object is achieved and by which it may be distinguished from all other devices of the same character of which applicant is aware, is the employment of two interacting electromagnets, one being fixedly mounted in the casing of the device, the other being carried by resilient supports. The effect of such construction is to enable the latter electromagnet to vibrate with respect to the first electromagnet and with respect to the casing as well. Vibration is effected when one of the two electromagnets is supplied with direct electric current while the other is supplied with alternating current.

A preferred embodiment of the invention is illustrated in the accompanying drawing in which—

Fig. 1 is a sectional view of a face massaging machine incorporating the principles of the invention, taken on the line 1—1 of Fig. 2.

Fig. 2 is a sectional view thereof taken on the line 2—2 of Fig. 1; and

Fig. 3 is a diagrammatic view of the electric circuits of the device.

The face massaging machine shown in the drawing comprises a casing 10, a vibrating head 11 fixedly mounted on an electromagnet 12 which in turn is mounted in the casing by means of resilient supports or cushions 13, a second electromagnet 14 fixedly mounted in said casing opposite said first electromagnet, a rectifier 15 for converting alternating electric current to direct current, and a source of alternating current, (not shown).

Figure 3 shows that alternating current passes through the second electromagnet and that direct current from the rectifier passes through the first electromagnet. This has the effect of mutual attraction and repulsion of the electromagnets in accordance with the pulsations of the alternating current. In consequence vibration of the first electromagnet, and hence of the head 11 which is mounted thereon, is set up.

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As above indicated, the device shown is simply a preferred embodiment of the invention. Modifications may be incorporated therein for example, as follows: The resilient support 13 is shown as made of rubber; it may be made of any other desirable resilient material. The head member 11 is shown as made of a non-ferrous material. It may be made of plastic or of rubber or of any other suitable material. The electromagnet which receives alternating current may be made to receive direct current and the electromagnet which receives direct current may be made to receive alternating current.

It will be noted in Figure 1 that the cores 16 and 17 respectively, of electromagnets 12 and 14, are in modified tongue and groove relationship with respect to one another. The purpose of this construction is to provide a greater degree of strength of attraction and repulsion between said electromagnets than would be the case if the cores thereof were of conventional design.

I claim:

An electric vibrating machine comprising a casing, a two ended electromagnet fixedly mounted in said casing, a second two ended electromagnet mounted in said casing by means of a resilient support at each end thereof, said electromagnets being positioned relative to each other to bring the two ends of one electromagnet into close proximity, respectively, to the two ends of the other electromagnet, grooves formed in the ends of one of said electromagnets facing the ends of the other electromagnet and complementary tongues formed in the ends of the other electromagnet facing said grooves, a head mounted on said second electromagnet and a rectifier carried by said casing, one of said electromagnets being connected to said rectifier, the other of said electromagnets and the rectifier being connected to a source of alternating electric current.

FRANCIS E. KNIPPER.

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