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Taaffe

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[54] **HUMAN RESISTIVITY SENSING DEVICE**

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[52] **U.S. Cl.** ..... **128/2.1 Z**; 324/62 R

[51] **Int. Cl.**..... **A61b 5/05**

[58] **Field of Search** ..... 128/2.1 Z, 2.1 R, 2.06 R; 35/22; 273/1 E; 324/62 R

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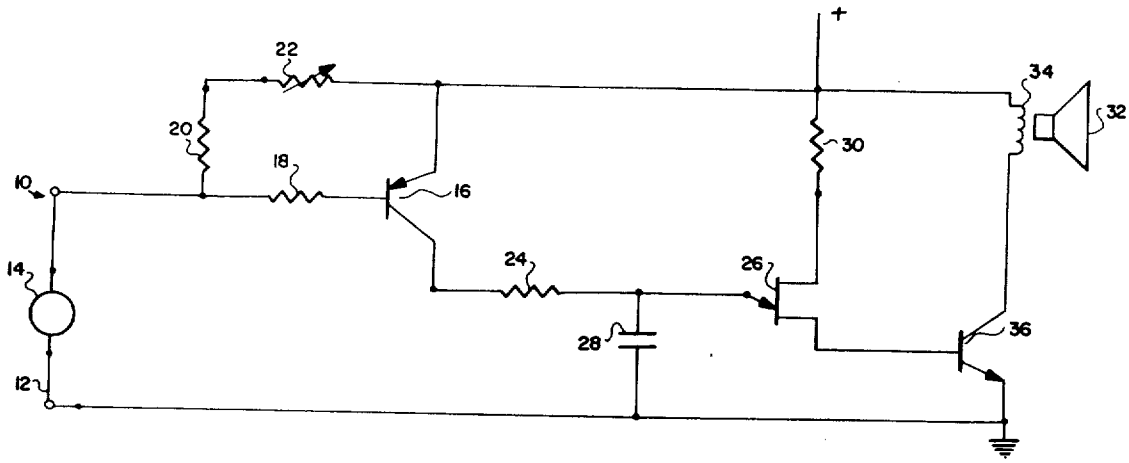
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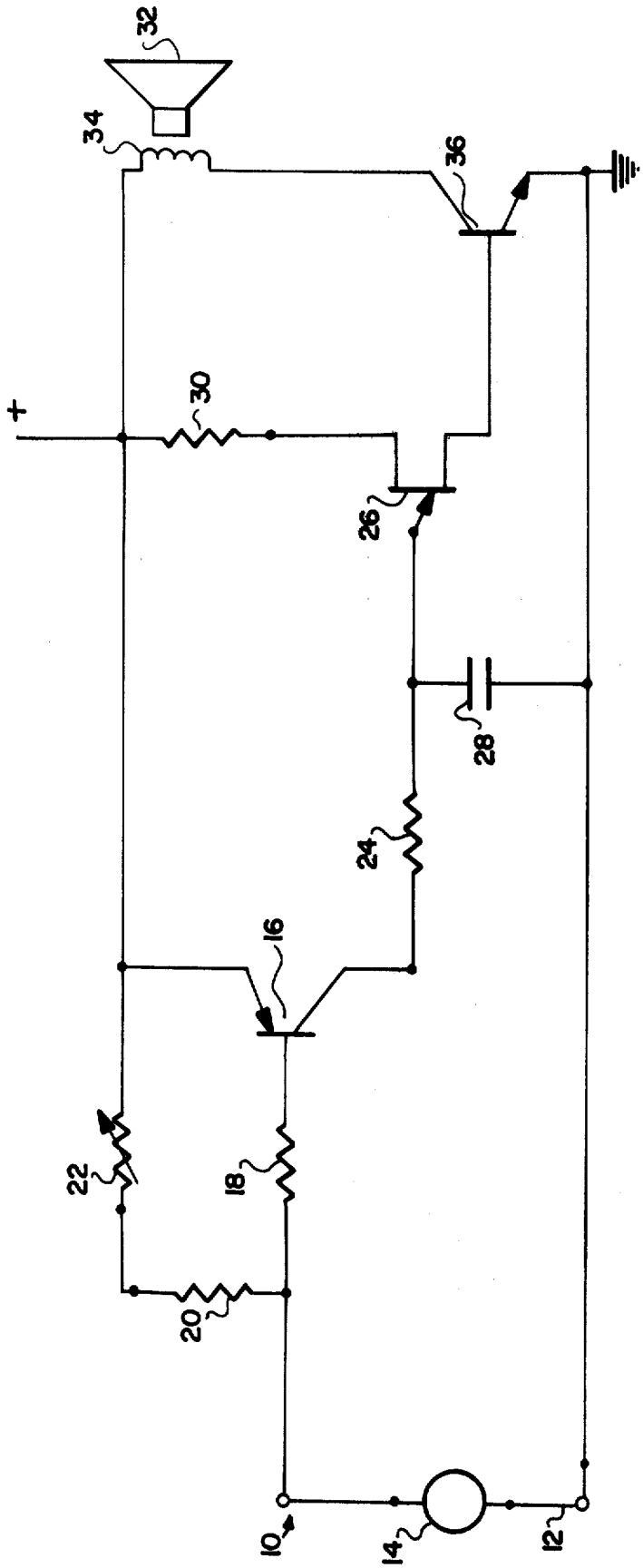
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[57] **ABSTRACT**

An electrical circuit which is capable of producing a varying signal output, either in frequency or amplitude which is responsive to the changing resistivity sensed on the skin of a subject. Electrodes are placed on the subject's body and as the surface resistance changes, an audible signal is produced which can aid the subject in relaxing.

2 Claims, 1 Drawing Figure




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HUMAN RESISTIVITY SENSING DEVICE

This invention relates to a bio-feedback type device used to gauge the level of tension of a subject.

It is proposed to provide a unique and improved electrical circuit having extremely good reliability and good utilization to sense the anxiety levels of a subject by producing an audible sound which is reflective of the subject's state. Biasing means are provided to set a norm about which the audible tone will vary.

The attached FIGURE illustrates an embodiment of this invention.

The electrical circuit is comprised of electrodes **10** and **12** attached to a gripping member **14** which is capable of being either in a flat position so as to be attached to a flat surface of the body, or circular so as to be attached to an extremity. Electrode **10** is connected to the base of a transistor **16** through a resistor **18** and through a fixed resistor **20** and a biasing resistor **22** to the emitter of transistor **16.** The collector of the transistor is connected through a resistor **24** to an emitter terminal of a unijunction transistor **26** as well as to one end of a capacitor **28,** the other end of which is connected to ground. One base terminal of the unijunction transistor is connected through a resistor **30** to one end of a speaker **32** coil **34** and to the emitter of transistor **16.** The other end of speaker coil **34** is connected to the collector of a transistor **36,** the emitter of which is connected to ground while the base thereof is connected to the second base terminal of unijunction transistor **26.**

The circuit functions in the following manner: electrodes **10** and **12** connect to various places on the skin of the body. The person using the instrument adjusts the range or biasing control by varying resistance **22** to a desired tone, such as many-frequency. As his body resistance decreases, the frequency of the tone increases thus signalling greater anxiety for lesser body resistance. Capacitor **28** is charged through transistor **16** at a rate controlled by resistor **22** which controls the amount of current produced by current source means formed by transistor **16.** Unijunction transistor **26** is a triggering device which is caused to trigger when its threshold rate is reached. The rate at which the level is reached is set by biasing resistor **22** but will be varied as the body resistance sensed at electrodes **10** and **12**

varies. This is due to the voltage divider formed by the body resistance and resistors **20** and **22.**

The output of unijunction transistor **26** is coupled through amplifier means formed by transistor **36** to energize speaker **32** so as to produce an audible sound.

I claim:

1. Electrical circuit means capable of being connected to the human body and producing a changing signal in response to changes in the surface resistivity of the human skin comprising electrode means adapted to be placed on the skin, variable frequency means comprising a unijunction transistor having an emitter and a pair of base terminals, biasing means connected between said electrode means and said variable frequency means for setting a biasing level for said variable frequency means, said emitter being connected to said biasing means,

said biasing means comprising a transistor and a variable resistance controlling the amount of current produced by said transistor,

said transistor having a base resistor connected thereto, said electrode means being connected through said base resistor to the input of said transistor to control the amount of current produced thereby,

a collector resistor connected to the collector of said transistor, a capacitor connected through said collector resistor to receive said current of said transistor to be charged thereby, said capacitor connected to said emitter of said unijunction transistor to cause said unijunction transistor to be triggered into conduction,

said variable resistance and the resistance at the electrode means forming a voltage divider,

the connection between said voltage divider connected to said transistor through said base resistor and,

speaker means connected to receive the output of said variable frequency means to produce an audible signal representation of the frequency of the signal produced by said variable frequency means.

2. Electrical circuit means as set forth in claim **1,** comprising amplifier means connected between the output of said unijunction transistor and said speaker means.

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