United States Patent

[11] 3,612,535

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[73] Assignee **Pennsylvania Electronics Technology, Inc. Pittsburgh, Pa.**

[54] **BODY HEAT COMPARISON GAME**
25 Claims, 13 Drawing Figs.

[52] **U.S. Cl.** ..... **273/135 R,** 73/362 AR, 338/22 R, 338/25
[51] **Int. Cl.** **A63f 3/00**
[50] **Field of Search** 273/1, 130, 131, 135, 161; 46/45; 73/362

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ABSTRACT: Novel game devices in which players bring a finger or other body part into contact with a thermistor-containing element, and by operation of electrical circuitry, values are observed on an ammeter. The thermistor containing element is preferably "thermally decoupled" from the chassis in which it is located. One disclosed feature involves the use of an audiofrequency oscillator and a speaker, with the thermistor being placed in the tank circuit of the oscillator, to afford an audible indication. A plurality of differently wired plugs or a keyboard, are disclosed for electrically interconnecting the thermistor members at the different stations to provide a multiperson game apparatus.

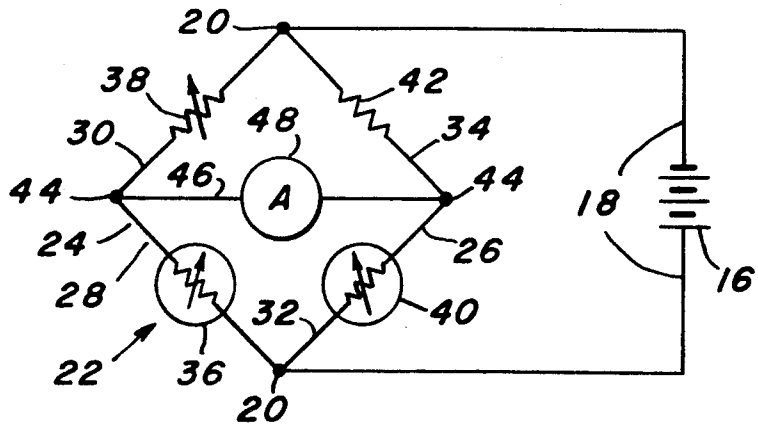


FIG. 1.

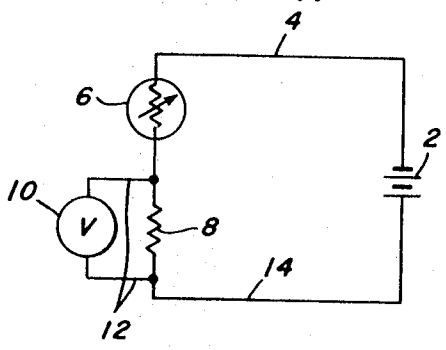


FIG. 2.

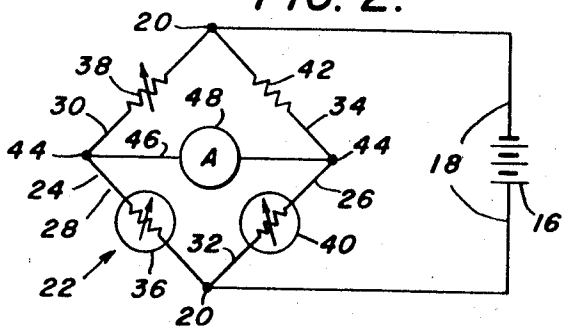


FIG. 3.

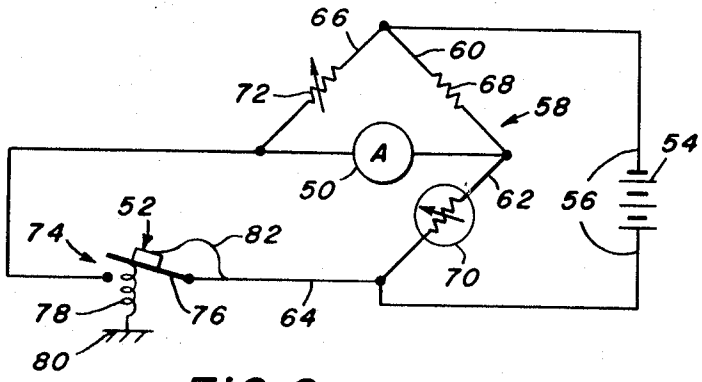


FIG. 4.

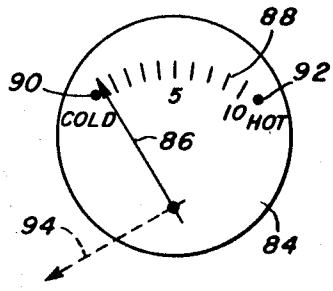


FIG. 6.

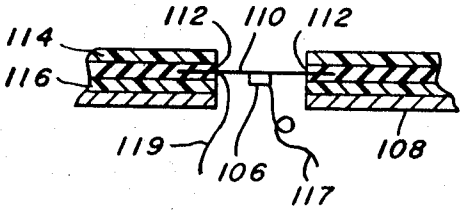


FIG. 5.

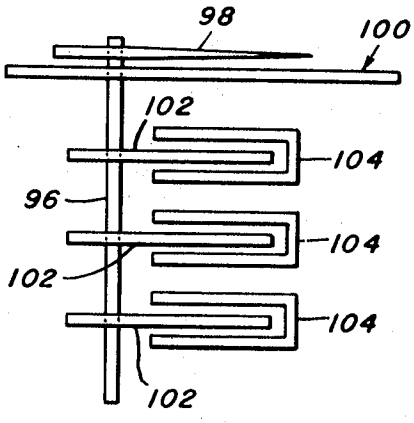
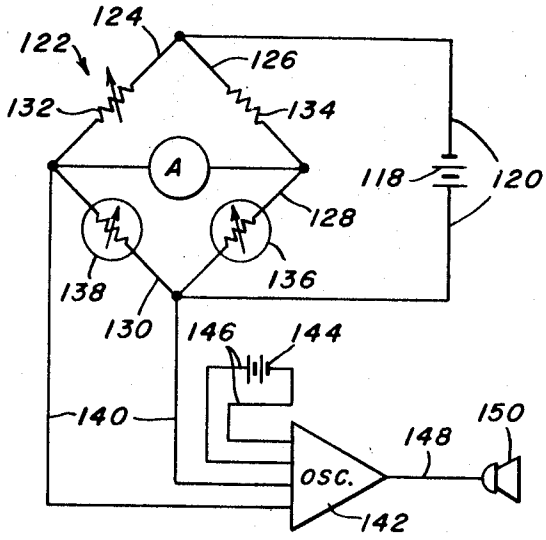


FIG. 7.



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FIG. 8.

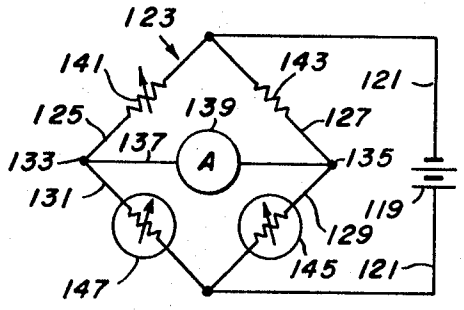


FIG. 9.

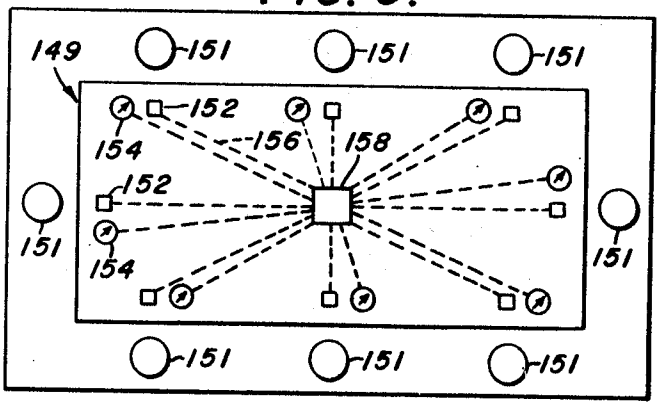


FIG. 11.

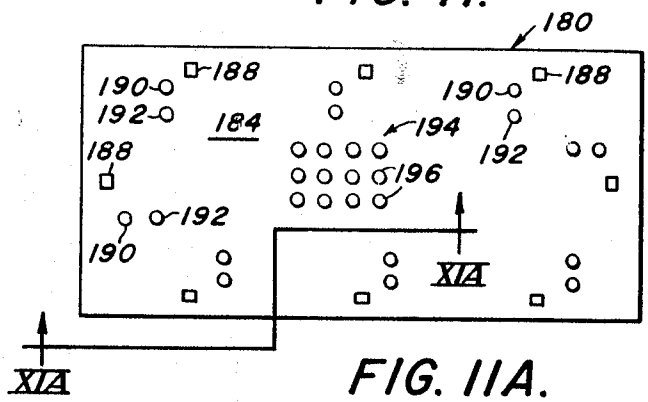


FIG. 12.

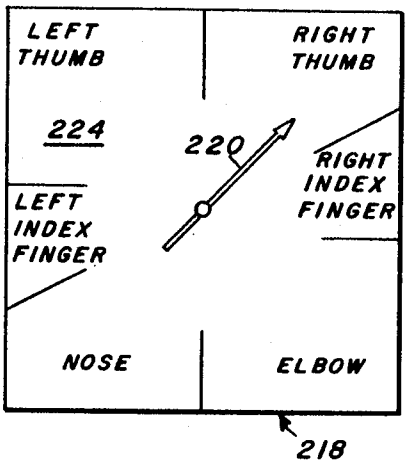
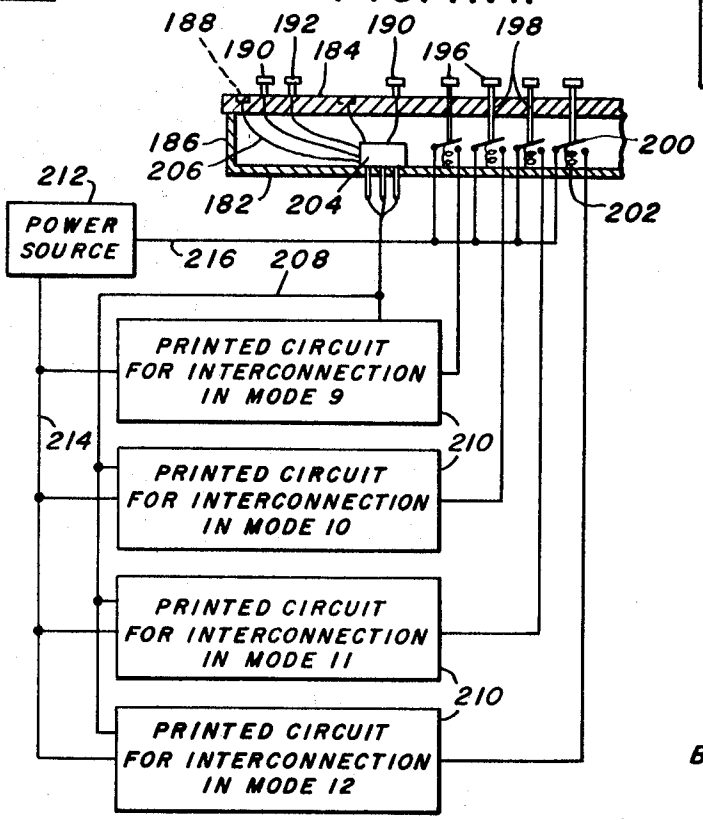


FIG. IIA.



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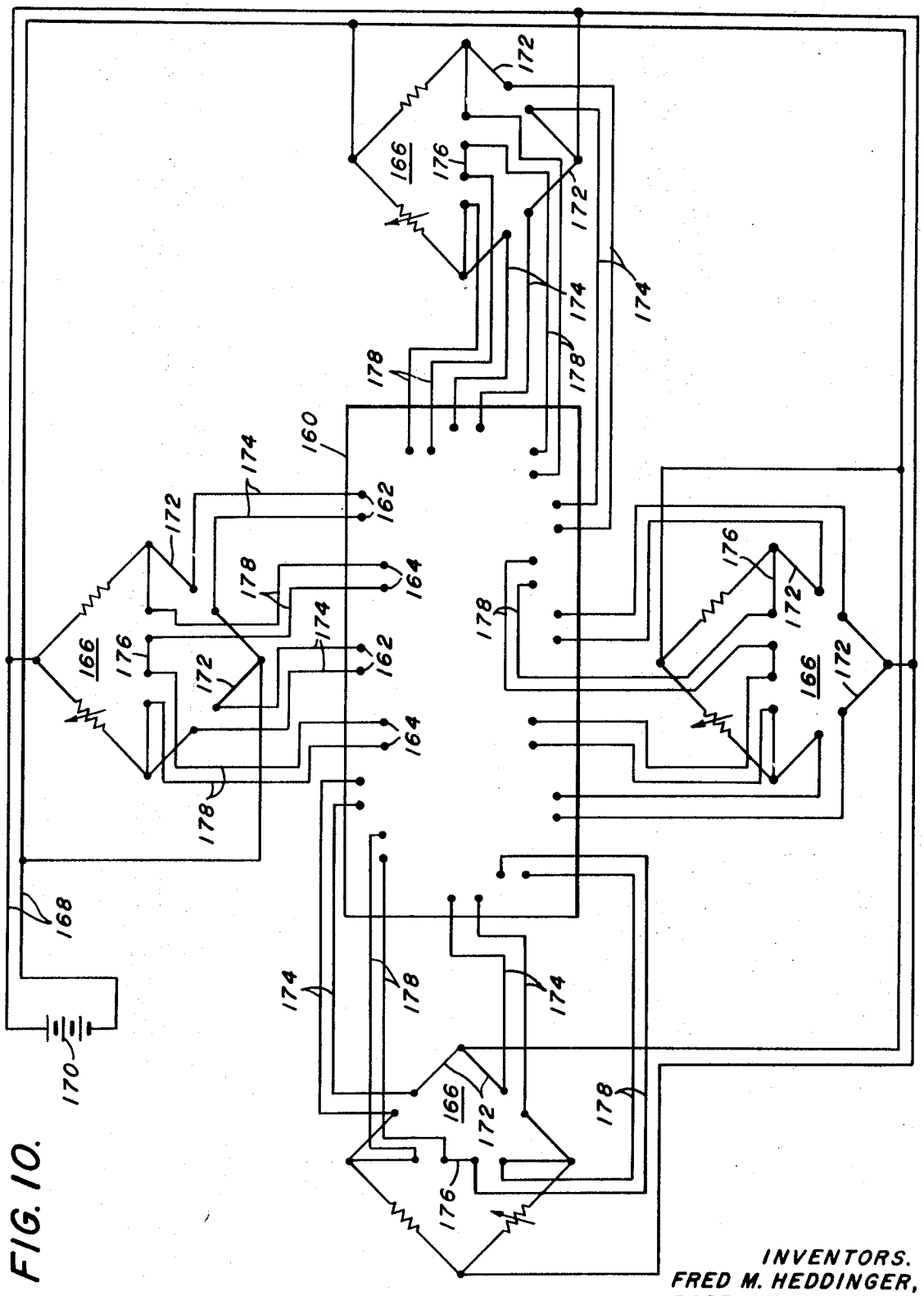


FIG. 10.

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BODY HEAT COMPARISON GAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to toy or game devices, and in particular, to games or toys comprising one or more elements containing thermistors.

2. Description of the Prior Art

It is known, from U. S. Pat. No. 2,976,505, how to make thermistors of positive temperature coefficient. A thermistor is an electrical resistance element that changes its resistance value with temperature. One known kind of thermistor has a negative temperature coefficient, i.e., it exhibits decreasing resistance with increasing temperature. The above-mentioned patent teaches how to make a thermistor of the other kind, i.e., with a positive temperature coefficient. The above-mentioned patent teaches that positive coefficient thermistors may be made by doping barium-strontium titanate with oxides of cerium and yttrium. The patent also teaches that the critical temperature may be adjusted downwardly by using more strontium oxide and that the room-temperature or low-temperature resistivity can be lowered to a desired value by increasing the quantity of rare earth oxide used. From the above-mentioned patent and other prior art, it is known how a positive-temperature-coefficient thermistor can be made that will respond at about 35° C., although for most purposes, such as oven temperature control, it is much more usual to make positive temperature thermistors that respond at higher temperatures, such as 100° C. or 150° C.

Also forming a part of the prior art is the known Wheatstone bridge electrical circuit, in accordance with which there is obtained a relatively sensitive indication of the magnitude of an electrical resistance, by positioning it in one of four circuit legs, with the legs being arranged to form two branches and with an ammeter or other current sensitive device being connected between the junction of the legs in one branch and the junction of the legs in the other branch.

It is also known how to make electrical circuits that are called oscillators and emit signals of appropriate or desired frequency, and that for the control of the frequency emitted by the oscillator, there is provided a tank circuit that comprises an appropriate combination of resistance with inductance or capacitance. From formulas familiar to those skilled in the art, it can be calculated what the emitted frequency of the oscillator will be, given a knowledge of the resistance and the inductance or capacitance in the tank circuit thereof. It is also known that when an oscillator operates within a certain frequency range, about 16 to 15,000 cycles per second, its output, directly or amplified, may be led to a suitable loudspeaker, and audible tones will be produced. Moreover, deliberate manipulation of the tank circuit electrical parameters (resistance, inductance, capacitance) has also hitherto been practiced.

It is also known how to make printed circuit boards that contain combinations of electrical elements and suitable associated conductors.

BRIEF SUMMARY OF THE INVENTION

In its simplest form, the present invention comprises the use of a positive-temperature-coefficient thermistor that changes its resistance sharply at about 35° C., together with a meter by means of which changes in the resistance of the thermistor are indicated, as part of an amusement device. Although a satisfactory indication can be obtained merely by placing a voltmeter across the thermistor, or across a large resistance in series with the thermistor, indications more sensitive can be obtained by placing the thermistor in a Wheatstone bridge circuit. Apart from the advantage of improved sensitivity of indication, the use of the Wheatstone bridge circuit has further advantages, depending upon the nature and location of the other resistance elements used to form it. By using a rheostat for one of the three other resistances, zeroing of the indicating ammeter is facilitated. If one of the other resistances is also a positive-temperature-coefficient thermistor located in the chassis of the invention device, compensation for ambient temperature changes can be achieved, lessening the need for zeroing and/or the taking of particular care in the manufacture of the other resistance elements of the bridge in order to make them have precise, predetermined resistance values. Use of the bridge circuit, with positive-temperature-coefficient thermistors in separate legs thereof, also makes it possible, if the second positive-temperature-coefficient thermistor is also so positioned in the device as to be capable of being brought into operative association with a body part of a player, to have the indicating ammeter or the like indicate directly the differences in the temperatures to which the two positive-temperature-coefficient thermistors are subjected. In its more elaborate aspects, the invention comprises a multiperson game wherein pluralities of positive-temperature-coefficient thermistors are connected in opposite legs of a bridge circuit to permit comparison. Optionally, the enjoyment factor of the game device is enhanced by connecting one of the body-contacting thermistor devices into the tank circuit of an audiofrequency oscillator, the output of which is connected to a loudspeaker emitting an audible indication. Suspense value is added by providing means for delaying the reaching of the final indicating value by the indicating ammeter or ammeters. In its most elaborate form, the invention comprises a game board having a substantial number of stations, such as eight or 12, with a thermistor-containing body-contact device (hereinafter referred to as a "frimdart") and an indicating ammeter or the like at each station, and centrally thereof, selector means for determining the mode of interconnection of the various electrical parts. The selector means may be a plurality of keyboard-actuated printed circuit boards or a plurality of plugs that contain printed circuit boards. In an advanced aspect of the invention, a game is played wherein a player has a choice of strategies, namely, whether or not to place his finger on the thermistor-containing element before him; in connection with this, various possibilities for the selection of the plug or keyboard key to be used will be evident. Chance means may be provided for selecting the key or plug to be activated, or for selecting the body part to be placed by all the players, or by individual ones of the players, upon their associated thermistor-containing element.

BRIEF DESCRIPTION OF THE DRAWINGS

A complete understanding of the invention may be obtained from the foregoing and following description thereof, taken together with the accompanying drawings, in which:

FIG. 1 is a circuit diagram of elementary equipment for use in the practice of the invention in its simplest form;

FIG. 2 is a circuit diagram of equipment for use in practicing the invention in a somewhat more complicated form;

FIG. 3 is a circuit diagram illustrating one means of retarding the development on the indicating ammeter of an indication of the temperature sensed by the thermistor-containing element that is used in accordance with the invention;

FIG. 4 is a schematic diagram illustrating other means of retarding the development upon the indicating ammeter of a valve indicating the temperature that is sensed by the thermistor-containing element in accordance with the invention;

FIG. 5 illustrates schematically yet another means for retarding the development upon the indicating meter of the temperature sensed by the thermistor-containing device;

FIG. 6 illustrates schematically the "thermal decoupling" feature of the invention;

FIG. 7 illustrates schematically another aspect of the invention, using an audiofrequency oscillator and loudspeaker to produce an audible indication;

FIG. 8 is a circuit diagram illustrating schematically the use of the invention to compare a plurality of sensed values;

FIG. 9 illustrates schematically a multistation game board that comprises apparatus according to the invention.

FIG. 10 illustrates a first selector means for use with apparatus according to the invention in accordance with FIG. 9;

FIGS. 11 and 11A illustrate a second selector means for use in accordance with the invention in accordance with FIG. 9; and

FIG. 12 illustrates a chance selector means for use with the invention as described hereinabove.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and in particular to FIG. 1, there is shown a circuit comprising a battery 2 and a conductor 4 leading therefrom. This connects with an element 6 comprising a positive-temperature-coefficient thermistor. In series with the element 6, there is resistor 8, across which there is connected a voltmeter 10 by means of leads 12. To the opposite side of the resistance 8, there is connected a line 14 that communicates with the other side of the battery 2.

The apparatus described above is operated as follows. A person places in intimate contact with the element 6 a portion of his body, such as the left index finger. The element 6, being a positive-temperature-coefficient thermistor that operates at about 35° C., changes remarkably in its electrical resistance, going, for example, from 100 ohms to about 10,000 ohms, this taking place within several seconds. The resistance 8 is on the order of 3,000 ohms, so that the voltage detected by the meter 10 changes remarkably. Although the equipment described above is relatively rudimentary, it will serve as a game or toy device, for operation by one person or a larger number of persons. Those skilled in the art will understand that the meter 10 can be placed across the element 6, rather than the element 8. In any event, however, the circuit shown in FIG. 1 does not yield an especially accurate or sensitive indication of the changes in the value of the resistance of the element 6.

Somewhat better in this respect is the circuit shown in FIG. 2. This comprises a battery 16, connected to leads 18 that are electrically connected to the ends 20 of a Wheatstone bridge circuit 22. This comprises two branches 24, 26, with the branch 24 comprising legs legs 28 and 30 and the branch 26 comprising legs 32 and 34. In the leg 28 there is positioned an element 36 that contains a positive-temperature-coefficient thermistor and is otherwise similar to the element 6 described hereinabove. In the leg 30, there is preferably provided a variable resistance 38 in the nature of a rheostat or the like. In the leg 32, there is provided another positive-temperature-coefficient thermistor 40, which is preferably located in the chassis of the invention device. In the leg 34, there is a resistance 42. Connected between the junction points 44 between the legs 28, 30 and 32, 34, there is a line 46 containing an ammeter 48. As those familiar with a Wheatstone bridge circuit will readily appreciate, relatively small changes in the value of the resistance 36 will effect substantial changes in the values indicated by the ammeter 48. Moreover, as indicated above, other advantages attend the use of a Wheatstone bridge circuit for the sensing of changes in the value of the resistance of the element 36. Especially, it becomes possible, by manipulation of the variable resistance or rheostat 38, to zero appropriately the reading of the ammeter 48. Also, it will be understood that, although for many purposes it is desirable that the positive-temperature-coefficient thermistor 40 be buried in the chassis of the invention device so as to enable ready compensation of the values indicated on the ammeter 48 in accordance with changes in the ambient temperature, so that it would no longer be necessary to be particularly careful about the exact values of the resistances 38, 36, and 42, it will also be possible to use a circuit in which the element 40 is the operative part of an element (hereinafter referred to as a "frimdart") adapted to be touched by a player in a body-temperature comparison game. This will make it possible, in the event that the "frimdart" containing the thermistor 40 is exposed, as at a second station of a game apparatus, to have its reading compared with that of the "frimdart" that contains the thermistor 36.

In FIG. 3, there is shown a circuit diagram that includes means for delaying the development, on the ammeter 50, of an appropriate value indicating the change in the value of the resistance of the "frimdart" 52, which correspond to the element 36 described above. As will be seen, the circuit diagram shown in FIG. 3 comprises a battery 54 that is connected by leads 56 with a Wheatstone bridge 58 that has legs 60, 62, 64 and 66. In the leg 60 there is a fixed resistor 68. In the leg 62 there is a positive-temperature-coefficient thermistor 70, which, as indicated above, may be located in the chassis of the invention device or in a "frimdart." In the leg 66 there is located a rheostat 72. In the leg 64 there is located a switch 74 that comprises a member 76, to which there is mounted the "frimdart" 52, with the switch 74 being urged to an open position by means of the spring 78, which is mounted against a fixed structure, as indicated at 80. An electrical connection is made to one side of the "frimdart" 52 through a lead 82, with the "frimdart" 52 being secured to the arm 76 of the switch 74 by means of conducting epoxy glue or other suitable electrical connection, so that when the arm 76 of the switch 74 is depressed, an electrical circuit is completed, with the "frimdart" 52 being connected into the circuit of the leg 64.

As indicated above, this serves to provide a moment or so of delay between the time that the user of the device comes into contact with the "frimdart" 52 and the time that there is developed on the meter 50 an indication of the change in the resistance of the thermistor in the "frimdart" 52.

FIG. 3 illustrates one means of delaying the development of such indication. Another means is illustrated in FIG. 4, in which there is seen the face of an ammeter 84, together with a needle 86. The face of the meter 84 also contains a number of graduations 88, arranged between a pair of stops 90, 92. It is to be understood that by spring means, or other suitable means (not shown,) the needle 86 is urged toward a position indicated on dotted lines, as at 94. Whenever the resistance of the positive-temperature-coefficient thermistor in the "frimdart" 52 or 36 changes appropriately, electrical current in the meter 48 or 50 will urge the needle 86 to a position intermediate the stops 90 and 92, but inasmuch as the needle 86 will ordinarily, in the absence of body heat applied to the "frimdart" 36 or 52, be at rest against the stop 90, a delay time will ensue between the application of body heat to the "frimdart" 36 or 52 and the development, on the meter 84, corresponding to the meter 48 or 50, of an indication appropriate to indicate the change in resistance that has taken place.

Still another means for delaying the development of appropriate indication is indicated in FIG. 5. In this figure, there is seen a shaft 96, upon which there is mounted a needle 98, with the face of the meter being indicated at 100. A number of platelike pieces of ferromagnetic material are indicated at 102, and these extend in space between the permanent magnets 104. The effect is one of magnetic damping.

As shown in FIG. 6, it is desirable that the "frimdart" 106 be "thermally decoupled" from the chassis 108 of the box or the like in which the invention device is placed. As indicated in FIG. 6, it is possible for the "frimdart" 106 to be glued with conducting epoxy cement or the like to a thin sheet 110 of aluminum foil or the like. If the aluminum foil 110 were directly thermally coupled to the chassis 108, it is likely that, after the invention device is used for a few minutes, it will itself become heated from the body heat of a hand or other body part rested against the chassis, and that this heat would be conducted to the "frimdart" 16. The ability of the "frimdart" 106, then, to indicate changes in its temperature as a result of body heat of parts of a body brought against it, in the use of the device of the invention as a toy or game, would thus be impaired. To avoid this, it is taught, in accordance with this aspect of the invention, that the ends of the piece 110 of foil are positioned within a layer 112 of plastic or other material of suitable insulating properties. Above and below the layer 112, there are layers 114, 116 of plastic that is not necessarily of insulating properties. This achieves "thermal deoupling" of the "frimdart" 106 from the chassis 108.

Referring now to FIG. 7, there is disclosed yet another aspect of the invention, in accordance with which audible indications are produced. The circuit shown in FIG. 7 comprises a battery 118, with leads 120 extending therefrom. The leads 120 extend to a Wheatstone bridge, indicated at 122. This comprises legs 124, 126, 128 and 130. In the leg 124, there is a rheostat 132. In the leg 126, there is a fixed resistor 134. In the leg 128, there is a positive-temperature-coefficient thermistor 136 that, as indicated above, may be contained with a "frimdart" or, if desired, may be buried for temperature-compensation purposes within the chassis of the invention device. Within the leg 130, there is a positive-temperature-coefficient thermistor 138 that, as will be understood, operates at about 35° C. and is contained in a suitable "frimdart." Connected across the thermistor 138 is a pair of leads 140 that connect it suitably to the tank circuit of an oscillator 142 of the audiofrequency type. The oscillator is suitably powered from a battery 144 through leads 146. As indicated above, by reason of the changes in the resistance value of the thermistor 138, the resonant frequency of the oscillator 142 is changed, so that upon its output line 148 leading to a loudspeaker 150 signals are produced that result in an audible change as a result of the application of body heat to the thermistor 138.

Referring now to FIG. 8, there is shown another circuit, in accordance with which thermistors located in a pair of "frimdarts" are so positioned that the difference in their electrical resistance, after having been brought into contact with the body portions, is sensed. The circuit shown in FIG. 8 comprises a battery 119 connected to a pair of leads 121 to a Wheatstone bridge 123. The Wheatstone bridge 123 comprises legs 125, 127, 129 and 131. Between the legs 125 and 131 there is a junction point 133, and between the legs 127 and 129 there is a junction point 135, and between the junction points 133 and 135 there is a line 137 containing an ammeter 139.

In the leg 125, there is a variable resistor or rheostat 141. In the leg 127, there is a fixed resistance 143. In the legs 129 and 131, there are positive-temperature-coefficient thermistors 145, 147, which, it will be understood, are contained within suitable "frimdarts" (not shown). With two persons playing the game of the invention, each of whom brings a body portion into contact with one or the other of the above-mentioned "frimdarts," so as to change the value of the resistance of the thermistors 145, 147, the circuit of FIG. 8 is so operated as to achieve, then, upon the meter 139, an indication of the difference between the resistance of the thermistor 145 and that of the resistor 147.

Referring now to FIG. 9, there is schematically shown a game board 149, around which there are positioned eight stations 151. At each station, there is located an appropriate "frimdart" 152 and an appropriate meter 154, and each meter 154 and "frimdart" 152 are suitably electrically connected, as at 156, to a central selection means, indicated schematically at 158, governing the interconnections of the various "frimdarts" 152 and meters 154 with one another and with an electrical power source.

Those skilled in the art will appreciate how, with different ones of a plurality of plugs serving as the means 158, it will be possible, during different rounds of a game, to arrange suitable interconnections. For example, in the first round, it will be possible to pit a first and second of the eight players occupying the eight stations 151 against each other, and the third against the fourth, and the fifth against the sixth, and so forth. In a second round of the game, it will be possible to pit the first, second, third and fourth, as a total, against the fifth, sixth, seventh and eighth of the players of the game. In a third round, the first and third are pitted against the fifth and seventh, and the second and fourth against the sixth and eighth. The game may, of course, proceed with suitable further rounds, such as readily may be imagined.

Referring now to FIG. 10, there is indicated schematically a terminal assembly 160 that may, in accordance with the invention, serve as the selector means 158 indicated above in connection with FIG. 9. The assembly 160 has a first set of terminals 162, each associated with a station "frimdart" 152 as indicated above, and a second set of terminals 164, each associated with an appropriate one of the meters 154 indicated above. Indicated on the figure, exteriorly of the assembly 160, are certain circuits that are connected to the above-mentioned terminals, and it will be most convenient to provide these on suitable monolayer or multilayer printed circuit boards, as is familiar to those skilled in the art. As will be apparent from an examination of FIG. 10, the assembly 160 serves to pit adjacent players against each other, namely, the first against the second, the third against the fourth, the fifth against the sixth, and the seventh against the eighth. To this end, there are provided as circuitry four Wheatstone bridge circuits 166, powered through leads 168 from a battery 170. In the legs 172 of the bridge circuits 166, there are positioned contacts that are connected by leads 174 with the terminals 162 of the assembly 160. Similarly, in the bridge conductors 176 of the bridges 166, there are positioned terminals that are connected, by means of conductors 178, to the terminals 164 of the assembly 160, which, as aforesaid, are connected to the meters 154 mentioned above.

Those skilled in the art can readily imagine how the various thermistors contained in the "frimdarts" 152 at the various stations 151 may, using conductors differently arranged, be made to suit the various desired modes of connections indicated above for use in different rounds.

In FIG. 10, each of the bridge circuits 166 is shown as containing a variable resistor. It is to be understood that, although it is possible to include a variable resistor in a printed circuit board, ordinarily this will not be done; rather, appropriate conductors will be provided in order to permit the manipulation, at the game board 149, and in the vicinity of various ones of the stations 151, of appropriate knobs or levers to provide a suitable adjustment.

Referring now to FIGS. 11 and 11A, these figures disclose an alternative embodiment of the invention in accordance with which a keyboard is used to achieve various modes of interconnection among the player-operated "frimdarts." There is provided a game board 180, seen in plan view in FIG. 11, which comprises a base 182 and a face 184 that is supported above and generally parallel thereto by means of a number of support members 186. At the various player locations or stations, there are located appropriate "frimdarts" 188, indicating meters 190, and zeroing adjustment knobs 192. Centrally of the board 180, there is located a keyboard 194 comprising a plurality of keys 196. The keys 196 are associated with plungers 198 that operate switches 200. As seen in FIG. 11A, the switches 200 are biased into a normally open condition by means of springs 202. The "frimdarts" 188, meters 190, and control knobs 192 are suitably connected with a distributor box 204 by suitable lines 206, and a conduit 208 leads from the distributor box 204 to a plurality of printed circuit means 210. A power source 212 connects to one side of the printed circuit means 210 through a conduit 214 and to the other side through a line 216 containing the switches 200. For simplicity, only the printed circuits for the ninth through the 12th modes of interconnection are illustrated in FIG. 11A; it is to be understood that the circuit would be expanded to provide a corresponding printed circuit for each of the keys 196 of the keyboard 194.

Various manners of using the apparatus shown in FIGS. 11 and 11A will be apparent to those skilled in the art. In this regard, it is to be noted that the printed circuit means 210 are not necessarily limited to the making of comparisons such as by pitting the players against each other in pairs or foursomes; rather, it is also within the skill of the art to devise and use modes of interconnection somewhat more elaborate, one possible example being a mode of interconnection such that the value on a player's meter 190 comprises the sum of the values attributable to the players on his right and left minus the valve attributable to the operation of his own "frimdart" 188. This leads to the possibility of playing a game of more ad-

vanced character, in accordance with which a player is called upon to make a strategy selection, that is, whether or not to place his finger or other body part upon his "frimdart" **188**. A game of this kind may be made one purely of chance, if (for example) the key **196** that is to be depressed is decided upon by chance means after the strategy has been selected. On the contrary, the game may also be made one that involves an element of skill. If the key **196** that is to be depressed is announced before the players select their strategies, an individual player can, by remembering or deducing from the earlier course of play the effect of depressing that key, utilize that knowledge to increase his score.

To increase still further the possibilities of the game, and the enjoyment derivable therefrom, it will in some instances be desirable to use, as part of the game equipment, a chance selection device such as the spinner **218** illustrated in FIG. **12**. As illustrated there, the spinner comprises a pointer **220** and a face **224** that is marked off with appropriate indicia into various regions that indicate, for example, the portion of the player's body that is to be placed against the player's "frimdart." The spinner may be spun once, with all the players using the body part indicated, or the spinner may be passed around from one player to another, with the different players bringing different body parts into contact with their "frimdarts."

While we have shown and described above certain embodiments of our invention, we intend to cover as well any change or modification therein which may be made without departing from its spirit and scope. In particular, though reference herein has been made repeatedly to positive-temperature-coefficient thermistors, it will be understood that with appropriate circuit modifications of such nature as will be apparent to those skilled in the art, negative-temperature-coefficient thermistors operating at about 35° C. could be used in place of the positive-temperature-coefficient thermistors. Those familiar with the thermistors now available will appreciate, however, that the negative-temperature-coefficient thermistors now known are appreciably less sensitive than the positive-coefficient ones.

It should also be mentioned that the sensitivity of the heat-sensitive "frimdart" can be improved by having it contain a plurality of thermistors. These thermistors are preferably connected in different branches of the Wheatstone bridge circuit. If they are both thermistors of positive-temperature-coefficient, they are connected in legs that lie on opposite sides of the bridge connection containing the meter. If they are of opposite coefficient nature, they are connected in different branches but in legs on the same side of the bridge connection.

Other features of novelty herein disclosed and/or claimed, as well as the above-noted improvement in sensitivity, may prove valuable in numerous nongame applications, such as in the making of fever thermometers, leak detectors, or temperature-sensitive probes, and in this connection, the invention is not necessarily limited to the use of thermistors that change their resistance substantially at about body temperature in such nongame applications.

What we claim as our invention is:

1. A method of playing a game, using as equipment therefor at least one thermistor having a resistance change temperature substantially that of human skin, a power source connected to said thermistor, and meter means operatively connected to said thermistor to register changes in its resistance,

said method comprising the steps of,

having each of a plurality of players bring a body part of said player into heat transfer association with said thermistor,

observing for each player the reading of said meter, and comparing the reading of one player with that of at least one other player to determine among said players a winner.

2. Apparatus for playing a body-part temperature comparison game comprising,

a power source,

a plurality of Wheatstone bridge circuits each of said Wheatstone bridge circuits having a first branch comprising first and second legs, a second branch comprising third and fourth legs, and a fifth leg joining the junction point between said first and second legs with the junction point between said third and fourth legs,

said second leg containing a positive-temperature-coefficient thermistor located in a "frimdart" and having a resistance-change temperature substantially that of human skin and being exposed in such a manner that a player of the game may touch it, said third leg containing a fixed resistor, said fourth leg containing a positive-temperature-coefficient thermistor having a resistance-change temperature substantially that of human skin, said fifth leg containing a meter, and said first leg containing a variable resistance of such value as to permit zeroing of said meter in said fifth leg,

means for connecting all of said Wheatstone bridge circuits to said power source, and

means for selectively interconnecting said bridge circuits one to the other for causing the thermistors in the respective bridge circuits to be electrically pitted one against another.

3. Apparatus as defined in claim **2**, characterized in that said positive-temperature-coefficient thermistors in said second and fourth legs are each contained in "frimdarts," whereby said meter in said fifth leg is caused to read directly a difference in resistance change resulting from simultaneous activation of said "frimdarts."

4. Apparatus as defined in claim **2**, characterized in that said apparatus further comprises an oscillator having a tank circuit and an audiofrequency output and

a loudspeaker operatively connected to the output of said oscillator,

said positive-temperature-coefficient thermistor in said second leg forming at least part of said tank circuit of said oscillator, whereby audible indications are produced when the resistance of said positive-temperature-coefficient thermistor in said second leg changes.

5. Apparatus as defined in claim **2**, characterized in that each Wheatstone bridge circuit is contained in a chassis, at least said thermistor in said second leg being contained in a "frimdart" exposed on an exterior surface of said chassis, said "frimdart" having electrically conductive thermal insulating means positioned between said thermistor and said chassis, whereby said thermistor is thermally decoupled from said chassis.

6. Apparatus as defined in claim **5**, characterized in that each Wheatstone bridge circuit is contained in a chassis, and in that said positive-temperature-coefficient thermistor in said fourth leg is positioned within said chassis to compensate for variations in ambient temperature.

7. Apparatus as defined in claim **5**, characterized in that said positive-temperature-coefficient thermistors in said second and fourth legs are each contained in exposed "frimdarts," whereby said meter in said fifth leg is caused to read directly a difference in resistance change resulting from simultaneous activation of said "frimdarts."

8. Apparatus as defined in claim **5**, characterized in that said apparatus further comprises an oscillator having a tank circuit and an audiofrequency output and

a loudspeaker operatively connected to the output of said oscillator,

said positive-temperature-coefficient thermistor in said second leg forming at least part of said tank circuit of said oscillator, whereby audible indications are produced when the resistance of said positive-temperature-coefficient thermistor in said second leg changes.

9. Apparatus as defined in claim **2**, characterized in that it further contains, in combination therewith, a chance selection device for indicating a body part to be placed by at least one player against said "frimdart."

10. Apparatus as defined in claim 9, characterized in that said positive-temperature-coefficient thermistors in said second and fourth legs are each contained in exposed "frimdarts," whereby said meter in said fifth leg is caused to read directly a difference in resistance change resulting from simultaneous activation of said "frimdarts."

11. Apparatus as defined in claim 9, characterized in that said apparatus further comprises an oscillator having a tank circuit and an audiofrequency output and

a loudspeaker operatively connected to the output of said oscillator,

said positive-temperature-coefficient thermistor in said second leg forming at least part of said tank circuit of said oscillator, whereby audible indications are produced when the resistance of said positive-temperature-coefficient thermistor in said second leg changes.

12. Apparatus as defined in claim 2, characterized in that said positive-temperature-coefficient thermistors in said second and fourth legs are each contained in exposed "frimdarts," whereby said meter in said fifth leg is caused to read directly a difference in resistance change resulting from simultaneous activation of said "frimdarts."

13. Apparatus as defined in claim 5, characterized in that it further contains, in combination therewith, a chance selector device for indicating a body part to be placed by at least one player against said "frimdart."

14. Apparatus as defined in claim 13, characterized in that said positive-temperature-coefficient thermistors in said second and fourth legs are each contained in exposed "frimdarts," whereby said meter in said fifth leg is caused to read directly a difference in resistance change resulting from simultaneous activation of said "frimdarts."

15. Apparatus as defined in claim 2, characterized in that said interconnecting means comprises a keyboard consisting of a plurality of keys, each of said keys having associated therewith a switch that is normally open and serves, when closed, to effect said electrical pitting of said thermistors in a desired mode.

16. Apparatus as defined in claim 15, characterized in that said positive-temperature-coefficient thermistors in said second and fourth legs are each contained in exposed "frimdarts," whereby said meter in said fifth leg is caused to read directly a difference in resistance change resulting from simultaneous activation of said "frimdarts."

17. Apparatus as defined in claim 15, characterized in that said apparatus further comprises an oscillator having a tank circuit and an audiofrequency output and

a loudspeaker operatively connected to the output of said oscillator,

said positive-temperature-coefficient thermistor in said second leg forming at least part of said tank circuit of said oscillator, whereby audible indications are produced when the resistance of said positive-temperature-coefficient thermistor in said second leg changes.

18. A method of playing a game with at least four players, using as equipment therefor at least four positive-temperature-coefficient thermistors, each having a resistance-change temperature substantially that of human skin,

means for electrically pitting the resistance changes in said thermistors occasioned by players bringing body parts into operative association therewith against one another in various predetermined modes, and

meter means for observing the outcome of said electrical pitting to award scores to said players, said method comprising the steps of

bringing body parts of at least two players into heat transfer association with selected ones of said thermistors,

activating said means for electrically pitting said resistance changes against one another to select one of said modes, and

comparing said scores as observed on said meter means to determine the winner.

19. A method as defined in claim 18, characterized in that said step of activating said pitting means to select one of said modes of electrical pitting is done by chance.

20. A method as defined in claim 19, further characterized by the inclusion of the step of selecting by chance the body part to be used by individual ones of said players.

21. A method as defined in claim 18, further characterized by the inclusion of the step of selecting by chance the body part to be used by individual ones of said players.

22. A method as defined in claim 18, characterized by all of said players bringing body parts into operative heat transfer association with respective ones of said thermistors.

23. A method as defined in claim 22, characterized in that said step of activating said pitting means to select one of said modes of electrical pitting is done by chance.

24. A method as defined in claim 23, characterized by the inclusion of the step of selecting by chance the body part to be used by individual ones of said players.

25. A method as defined in claim 22, further characterized by the inclusion of the step of selecting by chance the body part to be used by individual ones of said players.