Description

TITLE OF INVENTION: METHOD FOR HUMAN BODY TREATMENT

FIELD OF INVENTION

The present invention relates to a new method and process flow for human body treatment, not limiting to skin. This method and process flows consist of a microcontroller coupled with internal memory system that is able to be controlled by a keypad for easy usage and handling. The microcontroller is also linked to the treatment section wherein it is controlled by the present method and process flow. In addition to the microcontroller which is powered by a power source means, AC or DC supply, in which an indicator system consists of display and sound, is attached. The present invention has means to precisely control the application at a given or desired temperature, for a specific duration of time, with error handling and display or release sound in return.

BACKGROUND OF THE INVENTION

Skin break outs like acne is generally regarded as a common skin problems. Prompt and efficient treatment of acne, particularly in the early stages of development is vital for both resolving the condition and preventing the severe skin conditions.

Acne is a problem that all of us deal with at one time to another in life. Most acne will go away after we go through adolescence but some of us are still plagued with it far into our adult years. There are multiple treatment options have been available for acne and

localized abscess formations, however no one drug appears to be effective against the battle with acne or abscess formation on human body. Worst still some chemical preparations have significant side effects.

Other treatment methods that have been suggested include the methods disclosed in U.S Pat. 6,183,500 involving the use of phototherapy in the treatment of acne, in particular whereby a concentrated light source is used as a treatment. There is yet other existing mechanical devices such as ultrasound devices to delivery energy in a localized fashion have also been disclosed.

It has long been known that the application of heat to acne-prone or acne area or acne eruptions can be an effective way to treat these conditions. There are existing devices that uses just the same concept; however, the temperature controller utilizes analog temperature sensing to maintain a constant pre-determined temperature at the time of use.

Electronic systems are like humans in that their temperature needs to be measured at regular intervals. However, measurement alone is usually insufficient. The temperature reading must be interpreted properly and processed so that appropriate actions can be taken to counteract the unwanted temperature change.

There are an abundance of applications where temperature must be monitored and controlled, including personal computers, mobile phones, automobiles, medical equipment, and gaming consoles. Many devices have been developed to match the widely

varying technical and economic requirements of these applications, including thermistors, resistance temperature detectors (RTDs), infrared (IR). thermocouples, and more recently, IC temperature sensors.

There is therefore a need for improved treatment of human body through the application of heat utilizing a digital temperature controller as disclosed in the present invention as to ensure the accuracy and consistent temperature control during the treatment session through application of heat.

## BRIEF SUMMARY OF THE INVENTION

The present invention relates to the use of a regulated heat source that can be applied to a skin with acne problems, such acne eruption or localized abscess, in order to accelerate the death of invading bacteria, fungi or viral particles, or to assist in the breakdown of a skin irritant and thereby to speed up the recovery process.

It is an object of the present invention to provide an apparatus effective against skin diseases and itch. It is a further object of this invention to provide method of human body treatment, particular skin-related problems, which is simple, inexpensive, and convenient for use.

The main object of the present invention provides a heating means having a specific a temperature control means to control the heat temperature in about ±1°C. The present

invention also comprises temperature selection means within the range of 45–56°C. The present invention provides means to accurately detect heat temperature via the presence of an IC temperature sensor.

Another aspect of the present invention is the presence of an internal error-handling code within the program which is essential for all users, in particularly in the event the temperature of inadvertent over-heating which may easily result in burns on the skin surface of the user.

According to a third aspect of the invention, the heating means further comprises a safety means for auto switch off mode when the temperature hits the maximum level of 130 ° F.

Yet another object of this present invention is that the said embodiment will also result in auto switch-off when the device is not in use (idle mode).

There is yet another aspect of the invention to provide a pre-heat element to prevent user from experiencing a drastic temperature variation on the body of the user. In this regard, the said element provides the user an opportunity to test the temperature before applying on their body or face.

The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. It should be appreciated by those skilled in the art that the

conception and specific embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims.

The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages will be better understood from the following description when considered in connection with the accompanying figures. It is also to be expressly understood, however that each of the figures is provided for the purpose of illustration and description only and is not intended as a definition of the limits of the present invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows the block diagram of the said human body treatment which comprises of a microcontroller coupled with internal memory

FIG. 2 shows the method or the flow of the human body treatment when the device is turned on, before pressing the power button.

FIG. 3 indicates the flow when the device is turned on after pressing the power button. Digital tracking of the life span of the product is performed in this flow.

FIG. 4 shows the flow of the pre-heating loop and the auto sleep or standby mode routine is performed if the treatment part is idle for a period of time.

FIG. 5 shows the flow of the human body treatment starts when the heating button is pressed. The treatment part has a heating process flow to ensure the treatment part reaches the treatment temperature. It also shows that there is another safety routine that checks if the temperature is too high, that is exceeding the safety operating point of the temperature, by switching the treatment part off. The flow also includes the error handling instruction if the temperature is too high or faulty sensor.

FIG. 6 indicates the flow if the treatment part has not yet reached the desired temperature, it will loop back until the desired temperature has reached.

FIG. 7 shows the flow of self checking temperature of the treatment part.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

The block diagram in Figure 1 shows that the microcontroller that is coupled with an internal memory system connected to the power source and a keypad for easy usage and handling. Additional to that, the treatment section, which is the main human body treatment part, is connected and controlled by the microcontroller. The display and sound indicators are connected to the microcontroller that will display the temperature in accuracy, as well as alerting the user when any anomalies occur.

When the microcontroller is connected to the power source, the initializations of the hardware and the variables will be started, as shown in Figure 2. The initializations of the hardware includes, but not limited to, the microcontroller, internal memory system, display, sound, keypad and treatment part. For variables, all EEPROM counters will initialize to their default settings. Figure 2 shows that the EEPROM counter is set to N, and the device goes to sleep or standby mode. When the power button is not pressed, the device remains in sleep or standby mode; if the power button is pressed, then the human body treatment device is now turned on, by proceeding to A in the process flow Figure 2 and Figure 3.

The process flow in Figure 3 shows that at A, when the device is turned on, the power LED will turned on and concurrently, the microcontroller will read the EEPROM counter. Figure 3 shows that if the counter is equals to N – (N – N1), then the cycle LED green is turned on and proceed with C, together with the power LED turned on. Or else, if the counter is equals to (N – N1) – (N – N2), then the cycle LED green and red are turned on and proceed with C, together with the power LED turned on. Or else, if the counter is equals to (N – N2) – (N – N3), then the cycle LED red is turned on and proceed with C, together with the power LED turned on. Or else, if the counter is equals to (N – N3) – (N – N4), then the cycle LED red will blink and proceed with C, together with the power LED turned on. And finally if the counter is equals to (N – N4) – 1, then the cycle LED green and red will blink together and proceed with C, together with the power LED turned on. Each N, N1, N2, N3, and N4 values are stored in the EEPROM, which is the

internal memory of the microcontroller. C step is shown in both process flow Figure 3 and Figure 4.

Figure 4 shows the continuation of the process flow at step C, which heating up the treatment part. The desired temperature is around 105 ± 2 °F, where F is Fahrenheit. If the treatment part has not yet reached the desired temperature mentioned above, then the heating process in Figure 7 will loop until it reaches the desired temperature. Once this is achieved, the heat button needs to be pressed in order to proceed to step D. If this is not within S1 seconds, there will be a gentle sound alerted through the sound indicator which is connected and controlled by the microcontroller. The gentle sound alert repeats after S2, S3, and S4 seconds. Each S1, S2, S3, and S4 values are stored in the in the EEPROM. The gentle sound will alert the user for 4 times and if the heat button is not pressed, the treatment part will go to sleep or standby mode, which is step B.

When the desired temperature is achieved in the process flow shown in Figure 4, if the user pressed the heat button within the S1 or S2 or S3 or S4 seconds interval, then the user will then able to proceed with the human body treatment through the treatment part at step D, shown in Figure 4 and Figure 5.

Step D in Figure 5 indicates that when the heat button is pressed, the TIP LED is turned on and the counter is set to -1 into EEPROM. Concurrently, the treatment part is now heat up to 115 ± 2 °F, where F is Fahrenheit, which is the treatment temperature for human body parts. This temperature is constantly measured through the feedback loop

counter, to check if the temperature at the sensor is more than 130°F, where F is Fahrenheit. If the temperature is greater than 130°F, then all LED will turned on and the buzzer will sound three times. After that, the error handling routine will be started due to, but not limited to, faulty temperature sensor, or an error message will prompt the user through the display indicator with instructions, or even requires hard reset to the microcontroller so to reinitialize the hardware and variables.

Whereas, if the temperature at the sensor is less then 130°F, then the process flow shows that the treatment part is ready for performing treatment on to the human body, which is step E, shown in Figure 5 and Figure 6.

In Figure 6, step E indicates that the buzzer will now sounds two times and then maintaining the temperature at 115 ± 2 °F for 150 seconds. During this 150 second, the heating process is later described in Figure 7, in order to maintain the heat in this short period of time. After 150 seconds, the buzzer will sound X times, where X can be any integer, and the TIP LED will be turned off, and return to step C, which will then continue and repeat the process flow describe in the above Figure 4.

The heating process flow in Figure 7 indicates that the heating process is done every 0.0125 seconds, which is 12.5 micro-seconds interval. In this process flow, the sensor will check if the treatment part needs more heat if the temperature is lower than 115 ± 2 °F, and in vise versa, if the temperature at the treatment part is higher than 115 ± 2 °F, then it will not provide more heat to the treatment part.

It will be apparent that improvements and modifications may be made within the purview of the invention without departing from the scope of the invention defined in the appended claims.

All of the compositions and methods disclosed and claimed herein can be made and executed without undue experimentation in light of the present disclosure. While the compositions and methods of this invention have been described in terms of preferred embodiments, it will be apparent to those of skill in the art that variations can be applied to the devices or methods and in the steps or in the sequence of steps of the methods described herein without departing from the concept, spirit and scope of the invention. More specifically, it will be apparent that certain mechanical elements related to those described above can be substituted for the mechanical elements described herein to achieve the same or similar results. All such similar substitutes and modifications apparent to those skilled in the art are deemed to be within the spirit, scope and concept of the invention as defined by the appended claims.

Claims

1. This method for human body treatment reveals the process flow of a microcontroller with a memory, powered by a power source, which is linked to a treatment section, by providing a precisely controlled temperature at a given time, with error handling and display or release sound in return.

2. This method for human body treatment according to claim 1 has a hardware and other variables initialization, such as digital tracking of product life cycles to ensure quality of the product, when the power button is pressed on the keypad.

3. This method for human body treatment according to claim 1 has a pre-heating routine to ensure the treatment part is preheated until the desired temperature before used, after claim 2 is initialized.

4. This method for human body treatment according to claim 1 has a self intelligence microcontroller that is continuously sensing the temperature in a feedback loop to ensure constant temperature at the treatment part.

5. This method for human body treatment according to claim 1 has a digital temperature control to ensure the desired temperature is always accurate and displayed.

6. This method for human body treatment according to claim 1 has an auto activation alert system if the device is ideal for a certain duration of time, to remind the user that the said treatment part is ready for use.

7. This method for human body treatment according to claim 1 has a sleep or standby mode when the heated treatment part is ideal for a period of time.

8. This method for human body treatment according to claim 1 has an automated switch off loop if the temperature of the treatment part is exceeding the desired operating temperature. This safety feature is to ensure that the treatment part will not be over heated and harm the user.

9. This method for human body treatment according to claim 1 has an error handling feedback loop to handle all errors or anomalies during operation and require hard reset or user attention.