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(54) ELECTRONIC VAPORIZER

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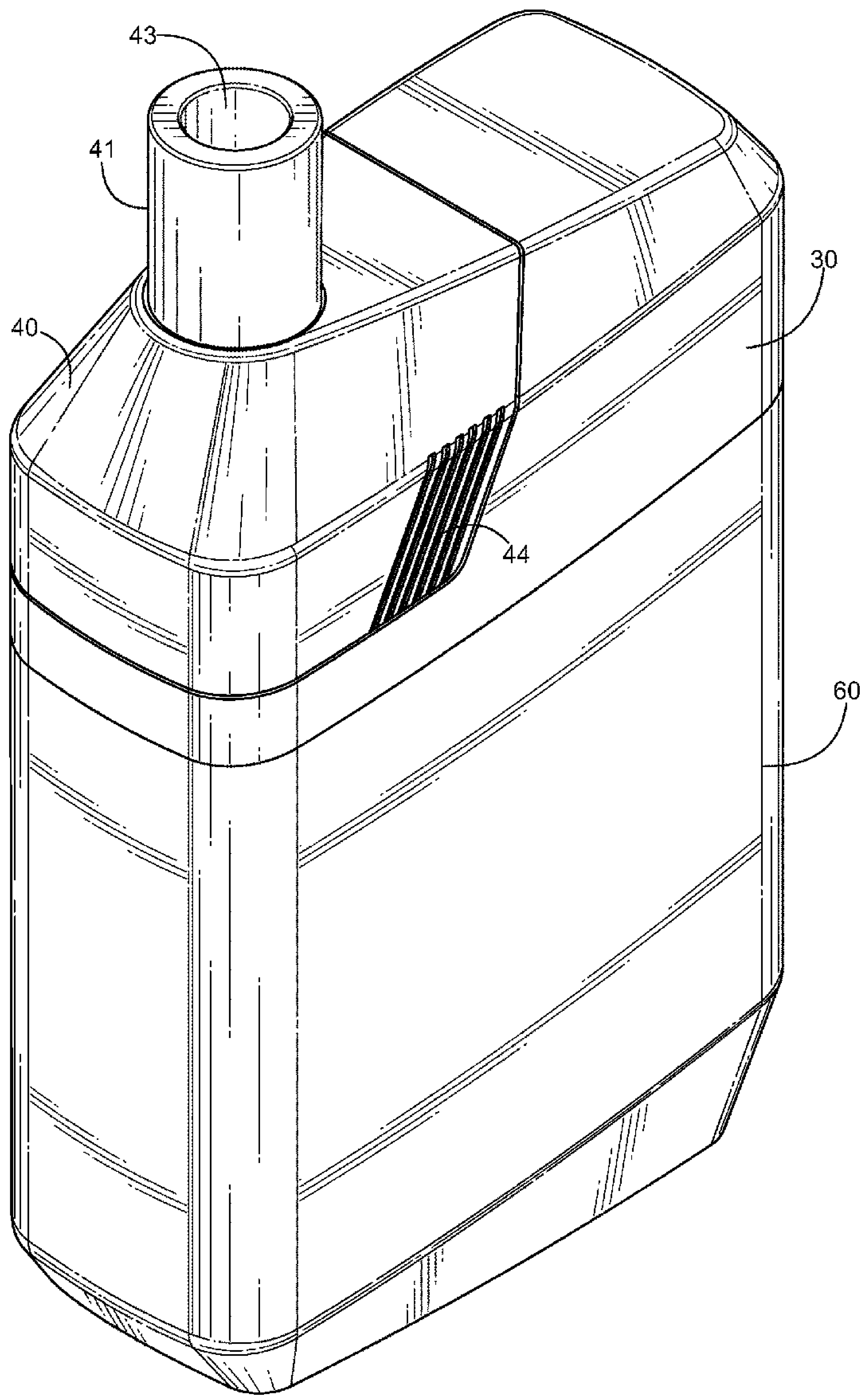
(57) **ABSTRACT**

An electronic vaporizer has a battery, and controls. The first and second heaters are activated by the controls. A middle chamber is heated by the first heater. Airflow is configured to pass through the middle chamber. The second heater heats an upper chamber. The airflow is configured to pass through the upper chamber from the middle chamber. The mouthpiece tube is connected to the upper chamber. The airflow passes through the mouthpiece tube. A processor is configured with a timing program which distributes battery power alternatively between the first heater the second heater according to a clock having a clock frequency. A control system has a voltage feedback loop inside a temperature feedback loop for controlling both the voltage and the temperature of the heating coil. The control system further includes a temperature sensor and a voltage sensor.



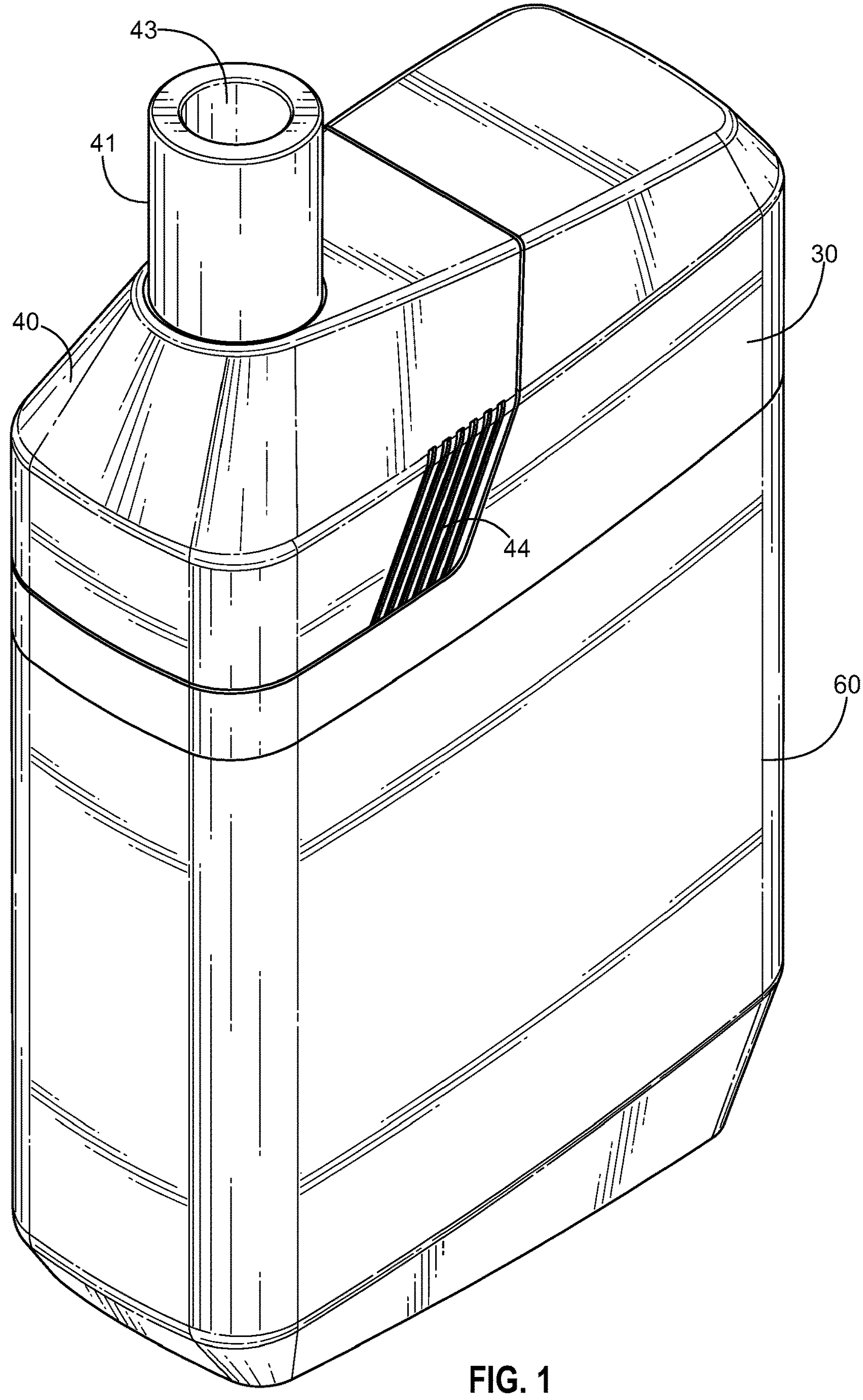


FIG. 1

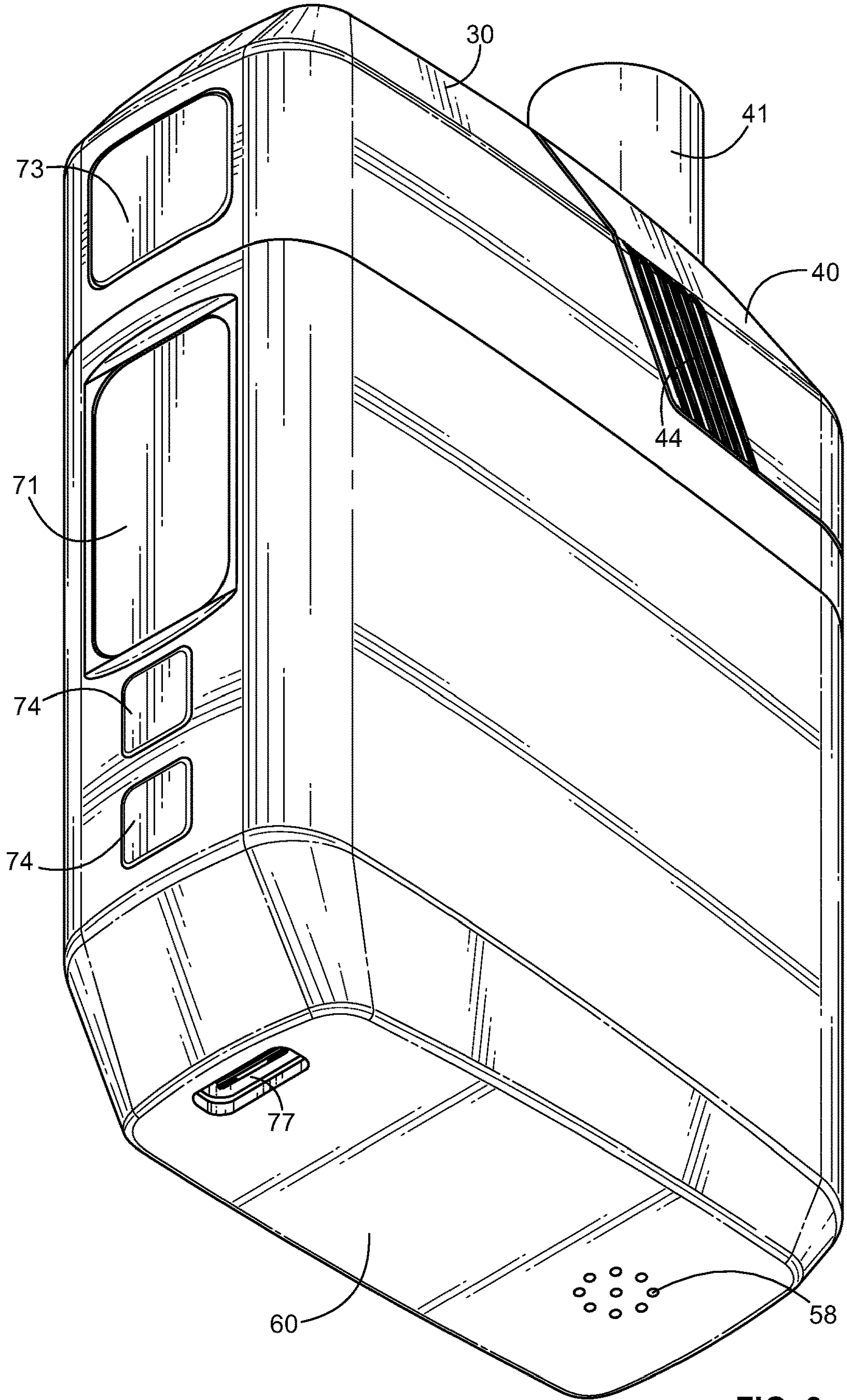


FIG. 2

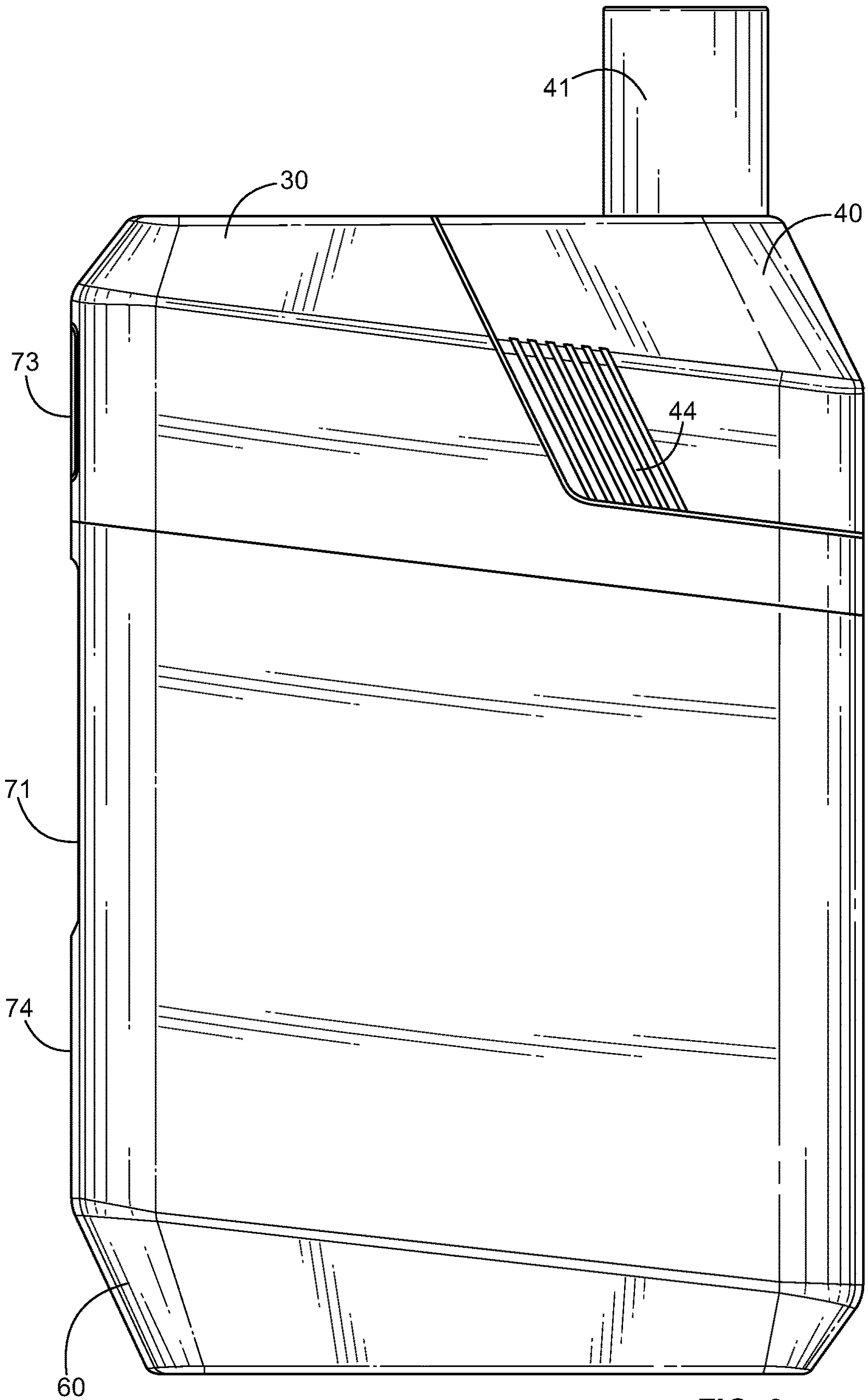


FIG. 3

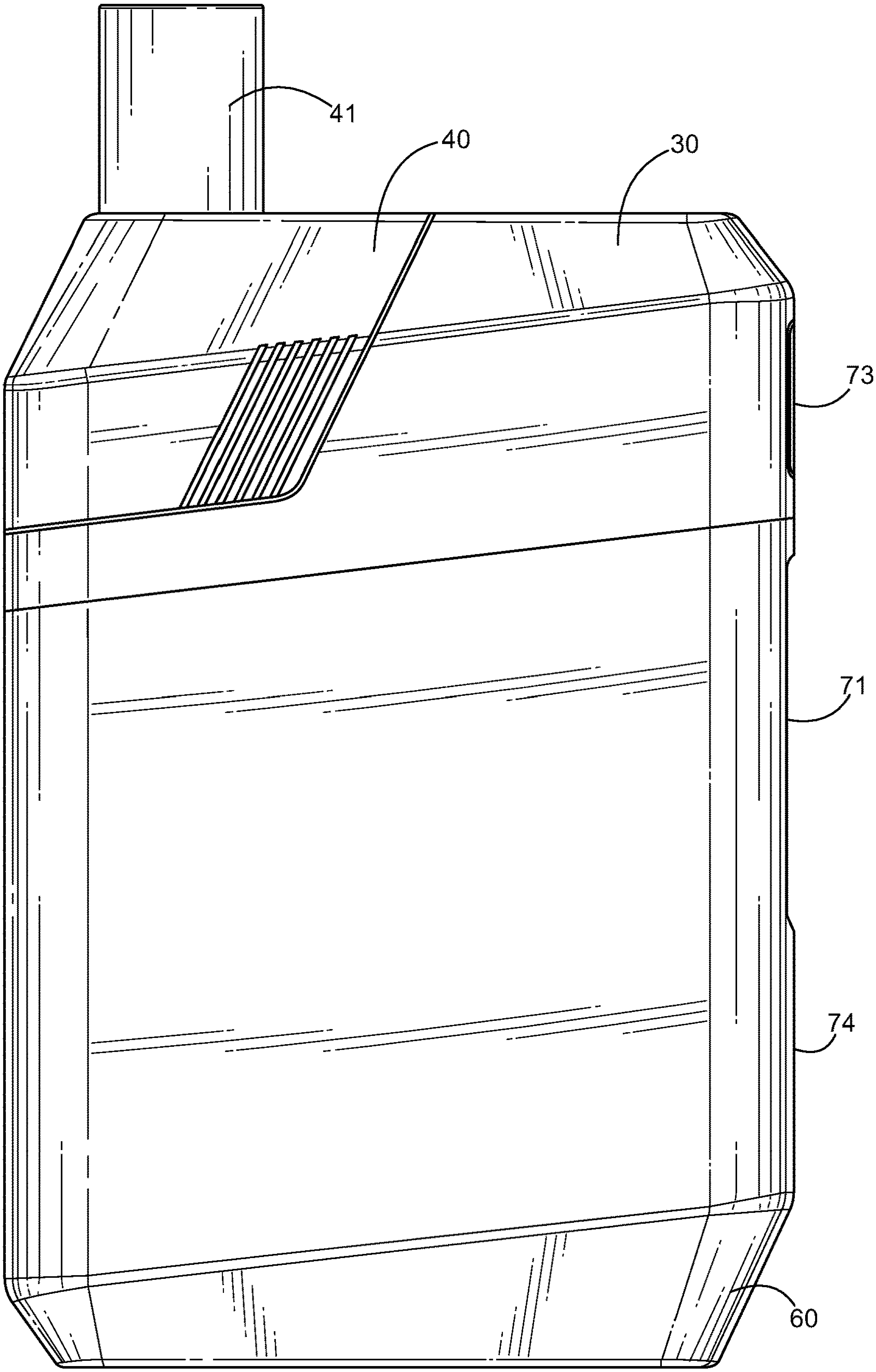


FIG. 4

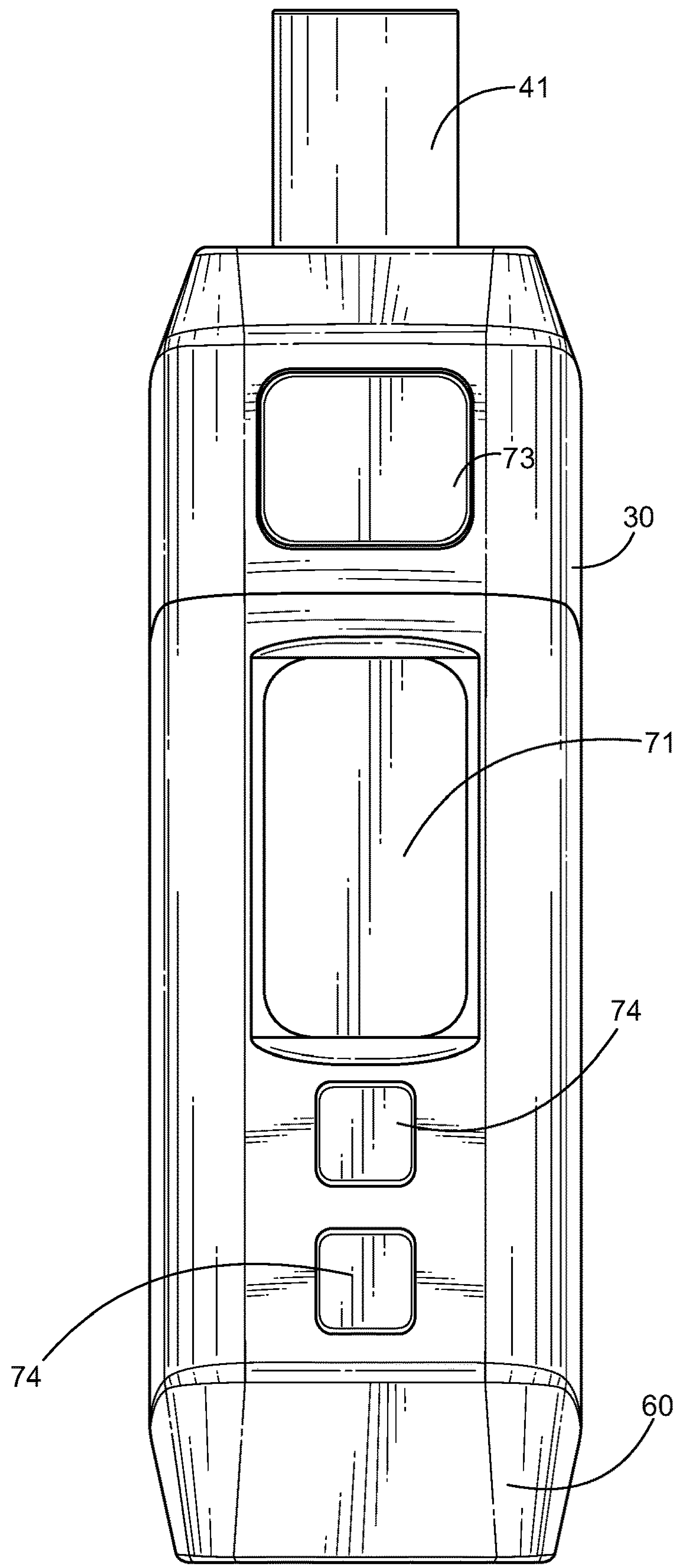


FIG. 5

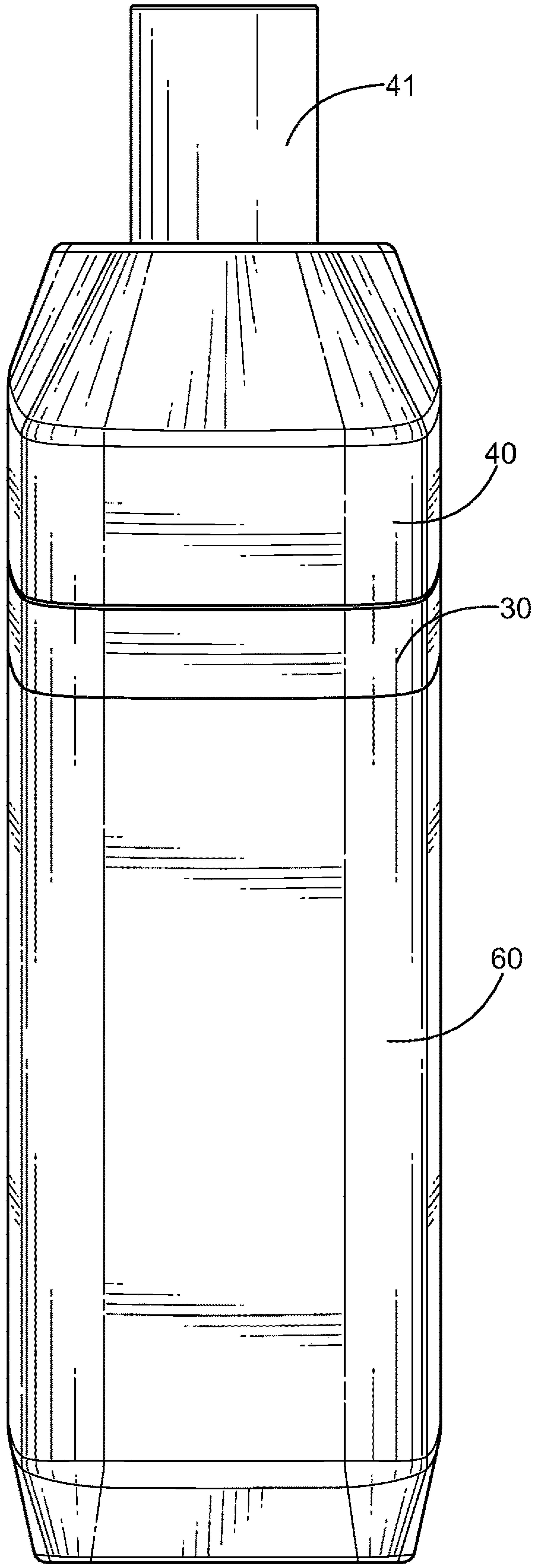


FIG. 6

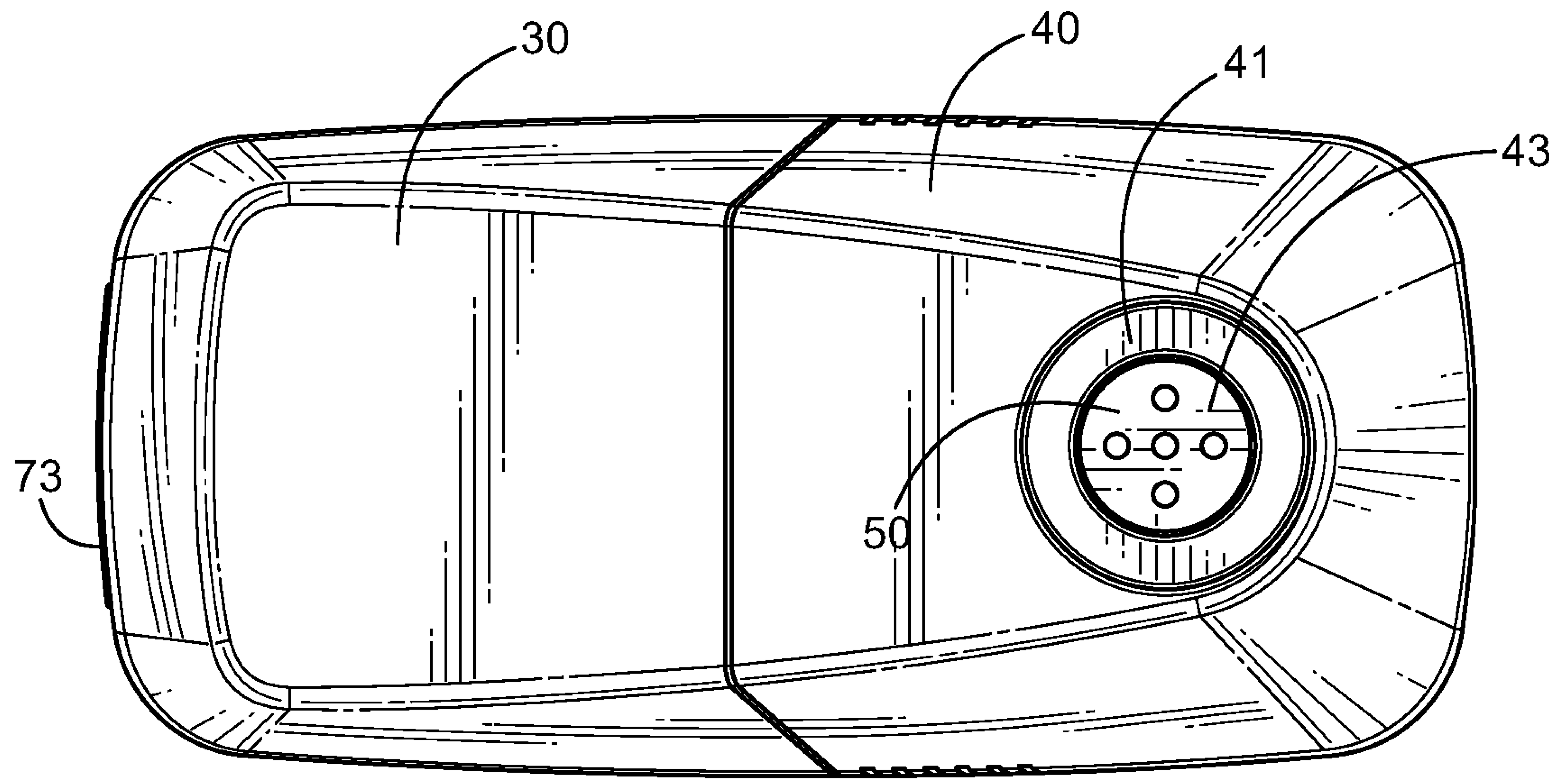


FIG. 7

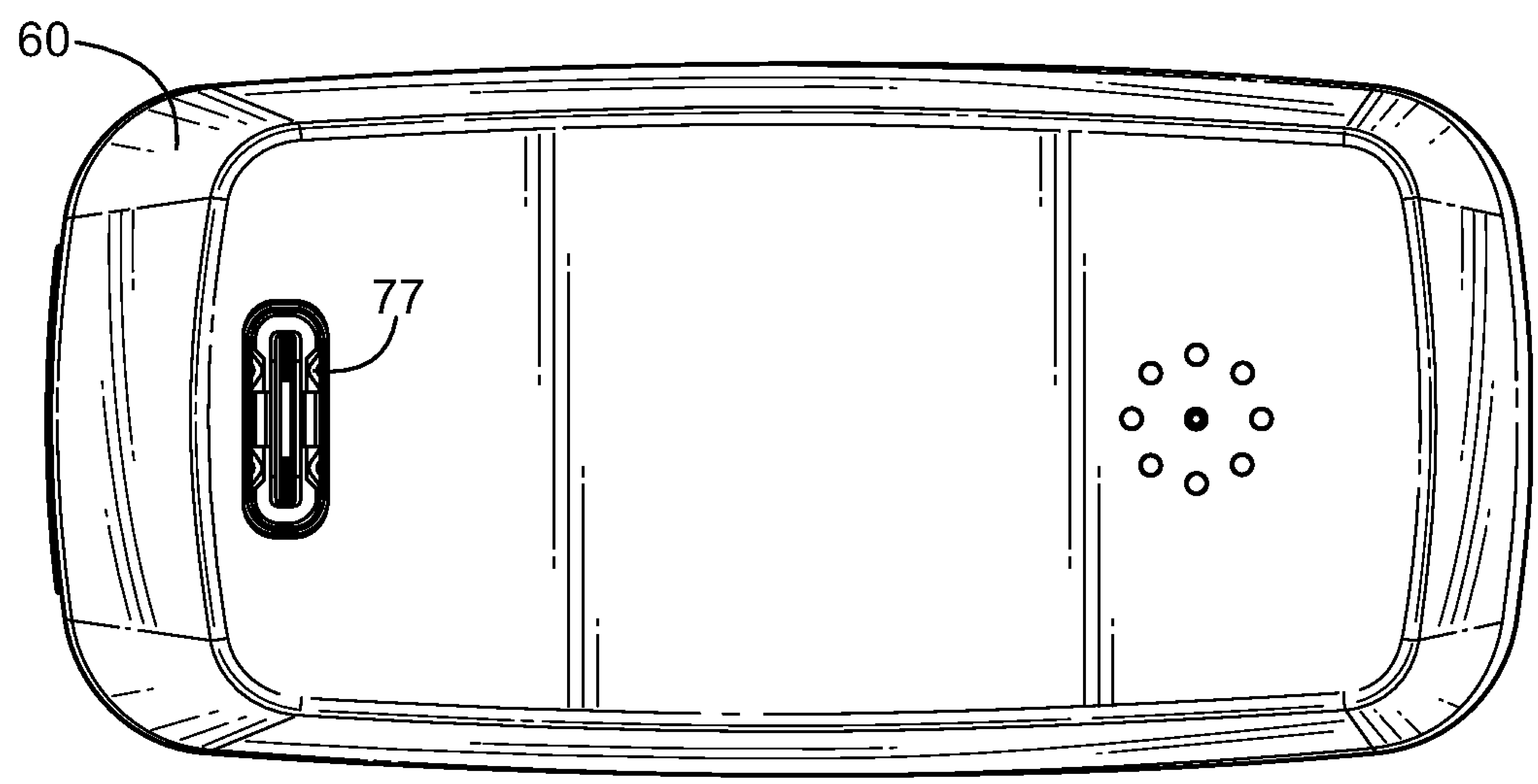


FIG. 8

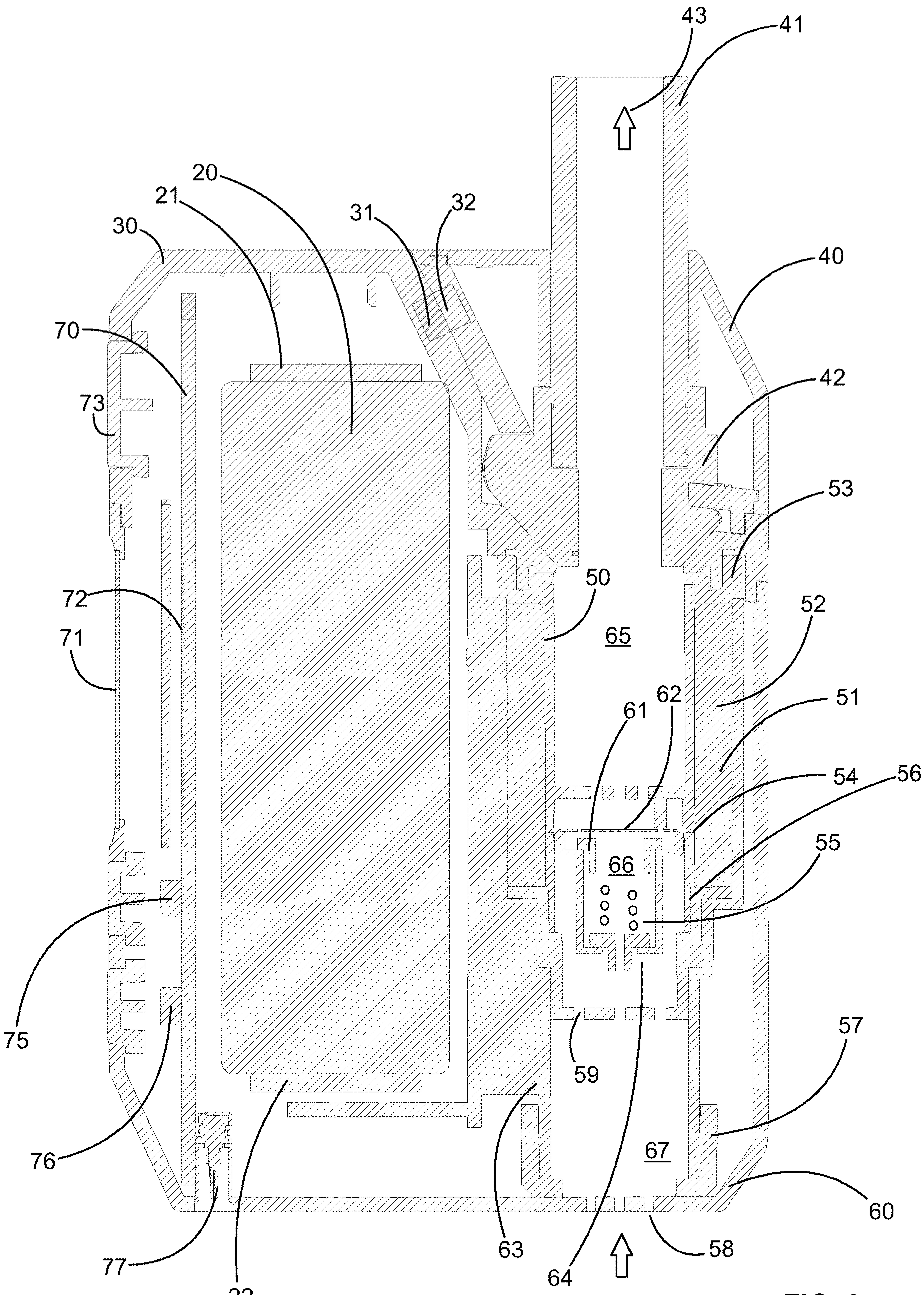

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FIG. 9

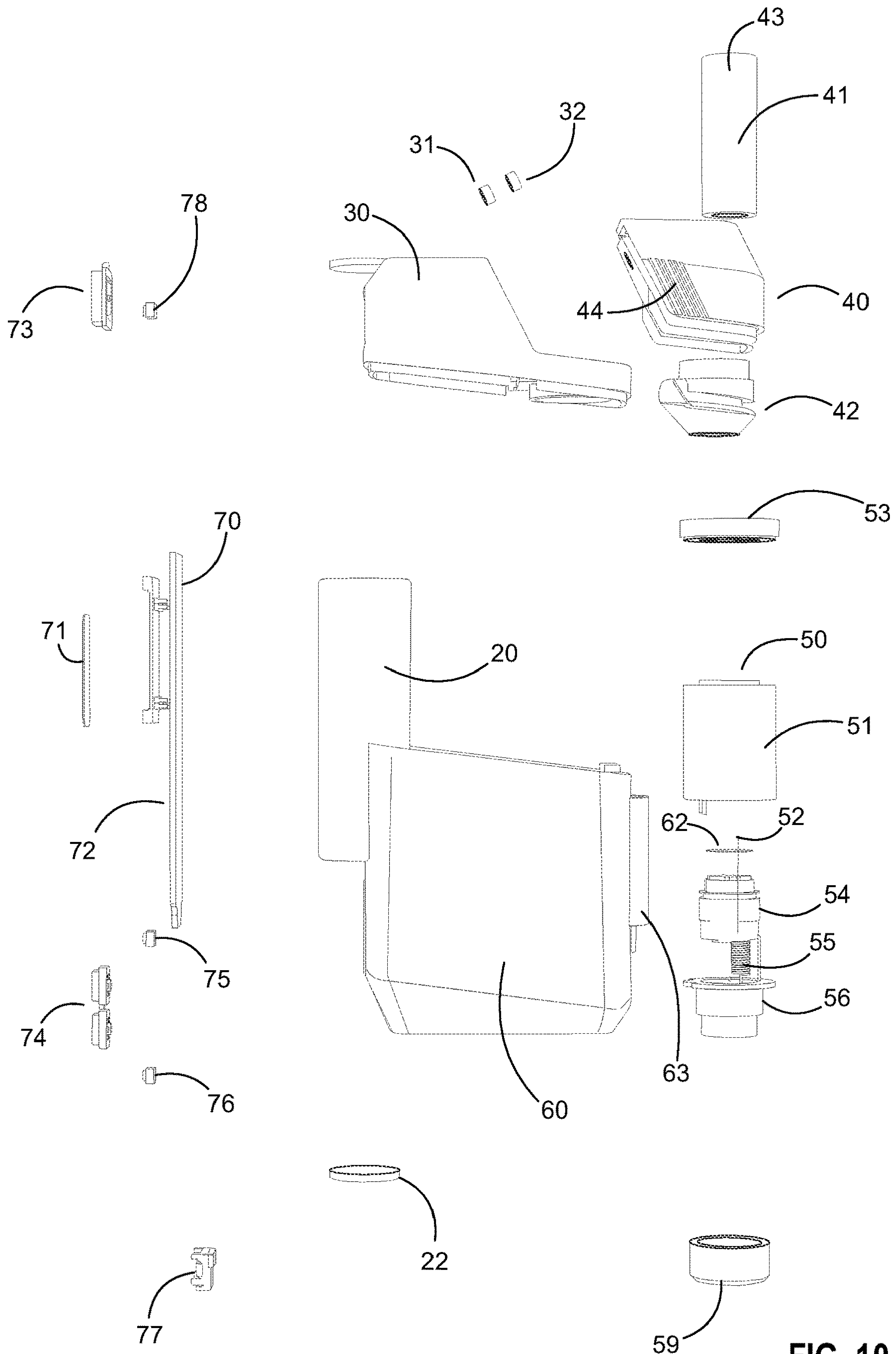
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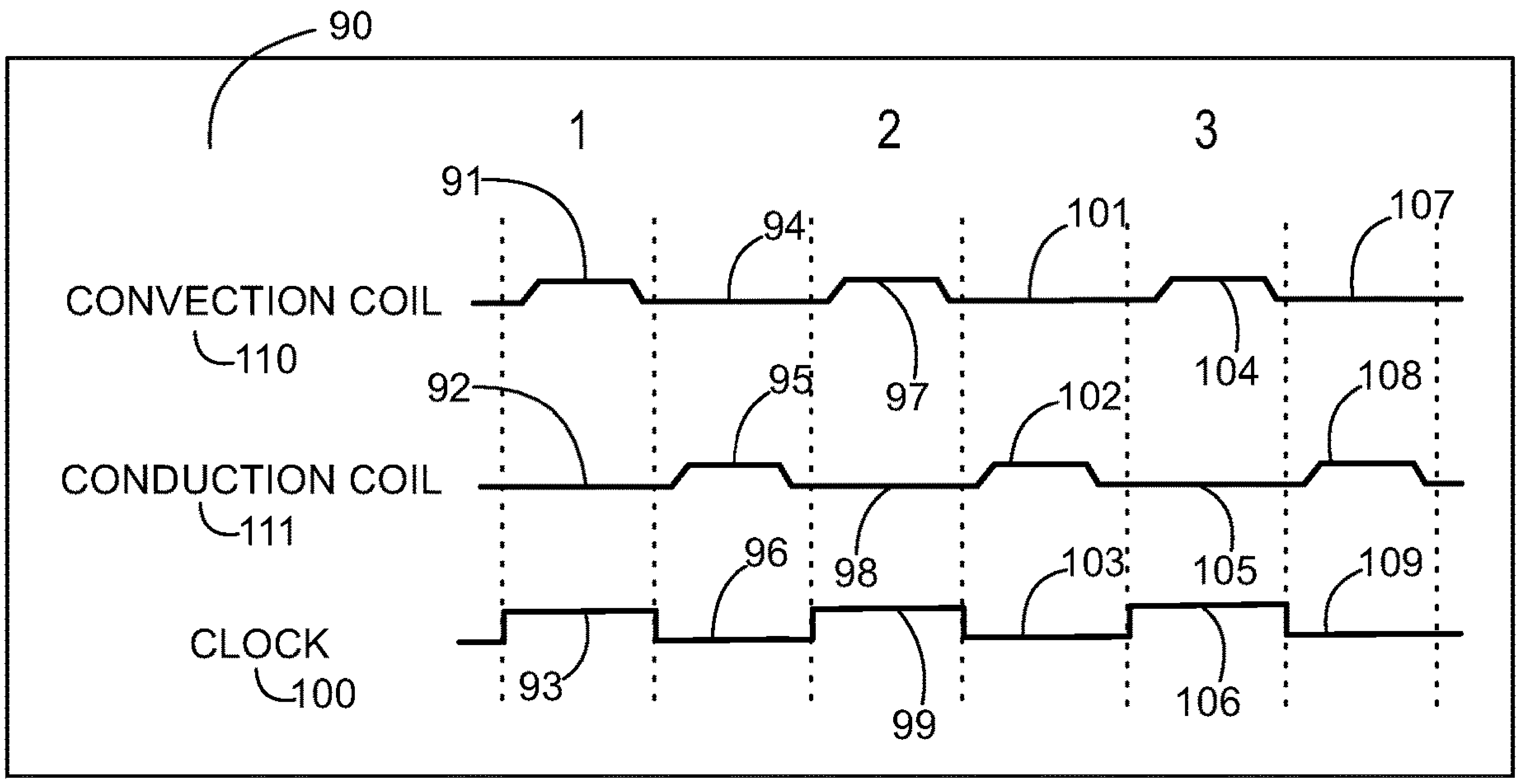
FIG. 10


90
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101
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CONVECTION COIL
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CONDUCTION COIL
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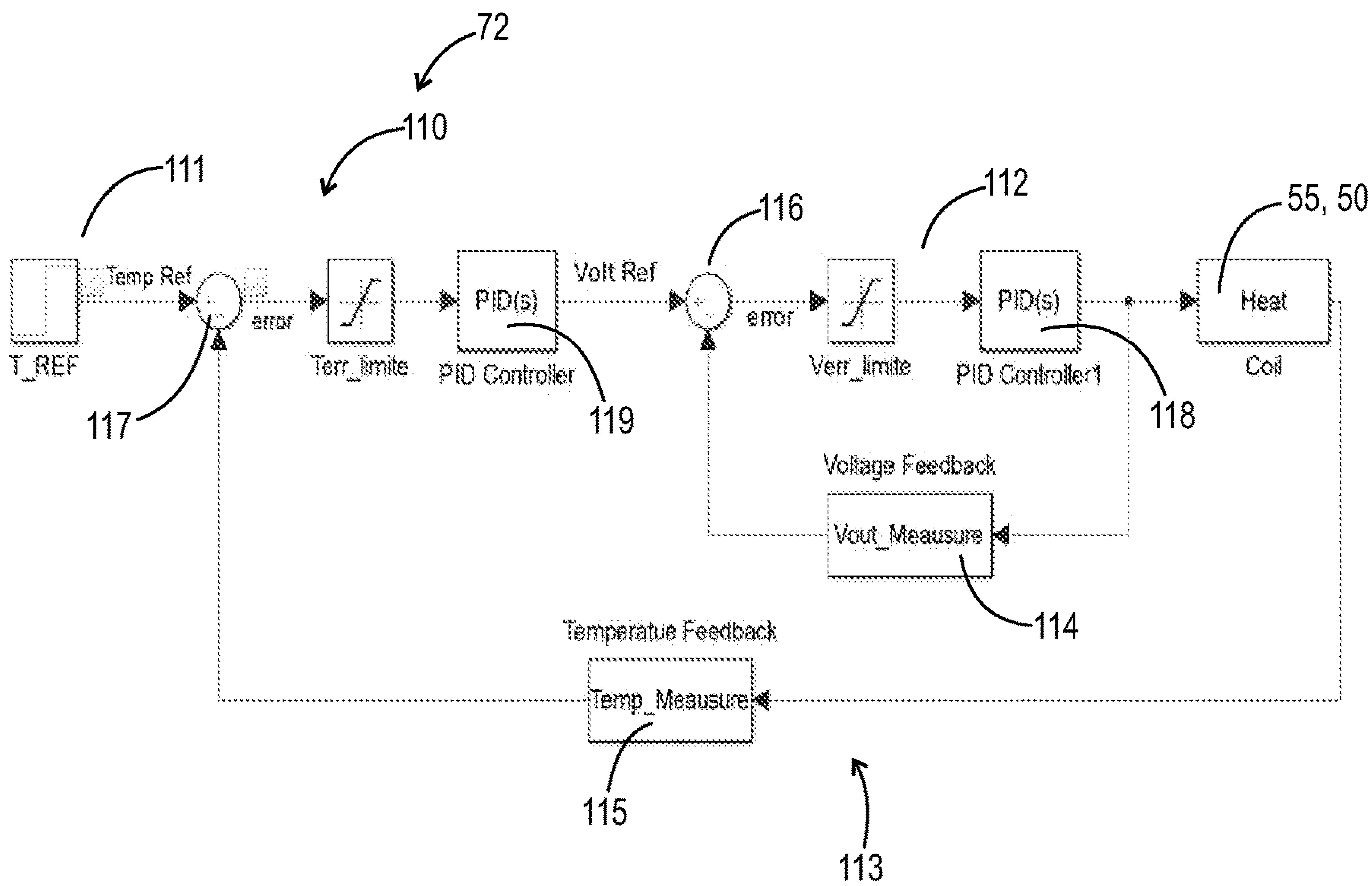
98
105
96
103
109
CLOCK
100
93
99
106

FIG. 11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111
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55, 50
Temp Ref
Volt Ref
T_REF
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PID(s)
PID Controller
Verr_limite
PID Controller1
Heat
Coil
117
119
118
Voltage Feedback
Vout_Meausure
114
Temperatue Feedback
Temp_Meausure
115
113

FIG. 12

ELECTRONIC VAPORIZER

FIELD OF THE INVENTION

[0001] The present invention is in the field of electronic vaporizers.

DISCUSSION OF RELATED ART

[0002] A variety of different electronic vaporizers have been described in the prior art for smoking articles. For example, in the international publication number WO2016126698A1 published on Nov. 8, 2016, titled Personal Electronic Vaporizer by inventor Curtis R. BERRY, the abstract discloses, "The disclosure relates to a personal electronic vaporizer (1) configured to receive a selected oven assembly (13) and heat the medium therein in accordance with a heating profile associate with the selected oven assembly. The personal electronic vaporizer may define a pathway (129) entirely surrounded by a material (131). The material is preferably an inert material such as glass or a material otherwise desirable to channel the vapors emitted by the heated medium to the user. The user may swap or select a different oven assembly associated with a different heating profile. The first oven assembly is thereafter removed from the personal electronic vaporizer and replaced with the newly selected oven assembly. The personal electronic vaporizer may automatically recognize the particular selected oven assembly and heat the substance therein according to a predefined heating profile associate with the oven assembly."

[0003] For example, in the United States publication number US20210282232A1 published on Sep. 9, 2021 titled Electronic Smoking Article Comprising One or More Microheaters by inventor William Robert Collett et al., the abstract discloses, "The present disclosure relates to an electronic smoking article that provides for improved aerosol delivery. Particularly, the article comprises one or more microheaters. In various embodiments, the microheaters provide for improved control of vaporization of an aerosol precursor composition and provide for reduced power requirements to achieve consistent aerosolization. The present disclosure further relates to methods of forming an aerosol in a smoking article."

[0004] For example, in the international patent number CN112535323A published on Mar. 23, 2021 titled Double-heating-wire Electronic Cigarette Controller and Double-heating-wire-Control Method by inventor Chen Yi, the abstract discloses, "The invention relates to a double-heating-wire electronic cigarette controller and a double-heating-wire control method. The double heating wire control method comprises the following steps of S1: when the electronic cigarette controller is powered on, one of the first heating wire and the second heating wire is randomly selected as a main heating wire, and the other one is selected as an auxiliary heating wire; s2: and detecting the number of the smoking ports, and switching the auxiliary heating wire to be the main heating wire when the number of the smoking ports reaches a first preset value n. The invention has the advantages that: the two heating wire terminals are arranged, and the main heating wire and the auxiliary heating wire are switched according to the number of the smoking openings, so that the service life of the heating wires can be prolonged, and the service life of the electronic cigarette can be prolonged; the first preset value and the working state of the auxiliary heating wire are adjusted according to the real-time smoking frequency of a user, so that the working time of a single heating wire can be prevented from being too short or too long."

SUMMARY OF THE INVENTION

[0005] An electronic vaporizer has a battery, and a set of controls. The first heater is activated by the set of controls. A middle chamber is heated by the first heater. An airflow is configured to pass through the middle chamber. A second heater is activated by the set of controls. The second heater heats an upper chamber. The airflow is configured to pass through the upper chamber from the middle chamber. The mouthpiece tube is connected to the upper chamber. The airflow passes through the mouthpiece tube. A processor is configured with a timing program which distributes battery power alternatively between the first heater the second heater according to a clock having a clock frequency. A control system has a voltage feedback loop inside a temperature feedback loop for controlling both the voltage and the temperature of the heating coil. The clock cycle for the voltage feedback loop is higher than the clock cycle for the temperature feedback loop. The control system further includes a temperature sensor and a voltage sensor. The temperature sensor can be a thermocouple mounted in the second heater.

[0006] The mouthpiece tube is preferably made of glass having spiral indentations to promote a vortex flow. The mouthpiece tube seals to a mouthpiece gasket which in turn is mounted to a mouthpiece assembly. The mouthpiece assembly has a magnetic connection to an upper housing. The upper housing is connected to a lower housing. The battery is mounted between the upper housing and lower housing.

[0007] A lower chamber has an air intake formed on a lower housing which has a lower frame.

[0008] The lower chamber can be mounted on the lower frame. The middle chamber and the upper chamber are mounted to the middle frame. A silicone heater cover is sandwiched between the lower housing and the lower frame.

[0009] The electronic vaporizer has a timing program that has a clock cycle greater than 100 Hz. The clock cycle has a high half and a low half. Either the first heater or the second heater is activated in the high half, and either the first heater or the second heater is activated in the low half. In a 50 percent program, if the first heater is activated in the high half, the first heater is not activated again in the low half. The first heater is a convection heater that heats air passing through it, and the second heater is a conduction heater that heats the article directly.

[0010] The convection heater has a convection heater coil. The airflow passes around and through the convection heater coil. The conduction heater is a ceramic heater having a ceramic body. The timing program alternates between heating the upper chamber and heating the lower chamber at a clock cycle greater than 10 Hz when the timing program is set for half convection heating and half conduction heating.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a perspective right side view of the present invention.

[0012] FIG. **2** is a perspective left side view of the present invention.

[0013] FIG. **3** is a left view of the present invention.
[0014] FIG. **4** is a right view of the present invention.
[0015] FIG. **5** is a rear view of the present invention.
[0016] FIG. **6** is a front view of the present invention.
[0017] FIG. **7** is a top side view of the present invention.
[0018] FIG. **8** is a bottom view of the present invention.
[0019] FIG. **9** a cross-section diagram.
[0020] FIG. **10** is an exploded view diagram.
[0021] FIG. **11** is a timing diagram.
[0022] FIG. **12** is a control system diagram.
[0023] The following call out list of elements can be a useful guide in referencing the elements of the drawings.
[0024] **20** Battery
[0025] **21** Upper Connection Pad
[0026] **22** Lower Connection Pad
[0027] **30** Upper Housing
[0028] **31** Upper Housing Magnet
[0029] **32** Mouthpiece Assembly Magnet
[0030] **40** Mouthpiece Assembly
[0031] **41** Mouthpiece Tube
[0032] **42** Mouthpiece Gasket
[0033] **43** Vapor Exit
[0034] **44** Mouthpiece Assembly Grip
[0035] **45** Mouthpiece Gasket Groove
[0036] **50** Ceramic Conduction Heater
[0037] **51** Insulation Tubing
[0038] **52** Temperature Sensor
[0039] **53** Upper Heater Cover
[0040] **54** Coil Holder
[0041] **55** Convection Heating Coil
[0042] **56** Coil Heating Cover
[0043] **57** Silicone Heating Cover
[0044] **58** Air Intake
[0045] **59** Heater Cover Openings
[0046] **60** Housing
[0047] **61** Ceramic Coil Top Spacer
[0048] **62** Screen Coil Cover
[0049] **63** Lower Frame
[0050] **64** Ceramic Coil Bottom Spacer
[0051] **65** Upper Chamber
[0052] **66** Middle Chamber
[0053] **67** Lower Chamber
[0054] **70** Printed Circuit Board Assembly
[0055] **71** Liquid Crystal Display Screen
[0056] **72** Central Processing Unit
[0057] **73** Fire Button
[0058] **74** Up And Down Buttons
[0059] **75** Up Button Switch
[0060] **76** Down Button Switch
[0061] **77** Universal Serial Bus Socket
[0062] **78** Fire Button Switch
[0063] **90** Coil Timing System
[0064] **91** Convection Coil First Half Of First Clock Cycle
[0065] **92** Conduction Coil First Half Of First Clock Cycle
[0066] **93** Clock First Half Of First Clock Cycle
[0067] **94** Convection Coil Second Half Of First Clock Cycle
[0068] **95** Conduction Coil Second Half Of First Clock Cycle
[0069] **96** Conduction Coil Second Half Of First Clock Cycle
[0070] **97** Convection Coil First Half Of Second Clock Cycle
[0071] **98** Conduction Coil First Half Of Second Clock Cycle
[0072] **99** Clock First Half Of Second Clock Cycle
[0073] **100** Clock
[0074] **101** Convection Coil Second Half Of Second Clock Cycle
[0075] **102** Conduction Coil Second Half Of Second Clock Cycle
[0076] **103** Clock Second Half Of Second Clock Cycle
[0077] **104** Convection Coil First Half Of Third Clock Cycle
[0078] **105** Conduction Coil First Half Of Third Clock Cycle
[0079] **106** Clock First Half Of Third Clock Cycle
[0080] **107** Convection Coil Second Half Of Third Clock Cycle
[0081] **108** Conduction Coil First Second Of Third Clock Cycle
[0082] **109** Clock Second Half Of Third Clock Cycle
[0083] **120** Convection Coil Cycle
[0084] **121** Conduction Coil Cycle
[0085] **110** Control System
[0086] **111** Reference Temperature
[0087] **112** Voltage Feedback Loop
[0088] **113** Temperature Feedback Loop
[0089] **114** Voltage Sensor Measurement
[0090] **115** Temperature Sensor Measurement
[0091] **116** Voltage Comparator
[0092] **117** Temperature Comparator
[0093] **118** Voltage Proportional Integral Derivative Controller
[0094] **119** Temperature Proportional Integral Derivative Controller

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0095] As seen in FIGS. **9-10**, the present invention is an electronic vaporizer. The electronic vaporizer has a battery **20** that powers a pair of heaters, such as a first heater and a second heater. The second heater can be a ceramic conduction heater **50** that heats an upper chamber **65**, and the first heater can be a convection heating coil **55** that heats a middle chamber **66**. The processor, controller or central processing unit **72** can be configured with firmware or software so that it switches between the first heater and the second heater. The second heater is a conduction heater and the first heater is a convection heater. Air passes first through the second heater for preheating and then passes into the upper chamber **65** where the conduction heater heats the plant material.

[0096] The battery **20** is housed within an upper housing **30** and a lower housing **60**. The upper housing has an upper housing magnet **31** that clicks to a mouthpiece assembly magnet **32** mounted on a mouthpiece assembly **40**. The magnetic attraction between the upper housing magnet **31** and the mouthpiece assembly magnet **32** provides a click audio indicator. The upper housing magnet **31** is mounted within a recess on the upper housing **30**, and the mouthpiece assembly magnet **32** is mounted within a recess on the mouthpiece assembly **40**. The magnet interface is formed at an angle relative to the mouthpiece tube **41** and the battery **20** and is generally tagging only oriented. The mouthpiece tube **41** can be formed as a glass mouthpiece that has spiral oriented indentations in it for providing a vortex flow. A concentrate can be put on a fibrous sponge pad which is inserted into the heating chamber which is the upper chamber **65**. Alternatively, plant material can be put directly into the heating chamber.

[0097] The mouthpiece assembly **40** has a mouthpiece tube **41** inserted into the mouthpiece assembly **40** and a mouthpiece gasket **42** that forms an airtight seal. The mouthpiece gasket **42** retains to the mouthpiece assembly **40** at a mouthpiece gasket groove **45**. The mouthpiece tube **41** has a vapor exit **43** that is collinear with an air intake **58** at an opposite end of the electronic vaporizer. The orientation of the magnet interface is parallel to the mouthpiece assembly grip **44** which is formed on the exterior surface of the mouthpiece assembly **40**.

[0098] A printed circuit board assembly **70** may include a central processing unit **72** and a liquid crystal display screen **71**. Up and down buttons **74** can be formed as an elastomeric cover that operates an up button switch **75** and a down button switch **76**. The battery can be charged through the universal serial bus socket **77** which also allows data operation between the central processing unit and a memory stored on the printed circuit board assembly **70**. The printed circuit board assembly **70** is mounted adjacent to the battery **20**. A fire button **73** has a fire button switch **78** that is mounted to the printed circuit board assembly **70**. The fire button **73** is parallel to the up and down buttons **74** with an LCD screen **71** mounted between the fire button **73** and the up and down buttons **74**.

[0099] The ceramic conduction heater **50** is mounted in the lower housing **60** between an upper heater cover **53** and a coil holder cover **54**. The coil holder cover **54** also holds the convection heating coil **55**. The temperature sensor **52** can be formed as a thermocouple that is mounted on the ceramic conduction heater **50**. The convection heating coil **55** is preferably set off from the coil holder **54** such as by a ceramic coil bottom spacer **64** that fits within a lower opening of the coil holder **54**. At an upper opening of the coil holder **54**, a ceramic coil top spacer **61** retains the convection coil. The convection coil can be activated when airflow is active. The coil holder cover **56** preferably has multiple lower openings such as heater cover openings **59** for allowing the flow of air to pass through the convection heating coil **55**. The convection heating coil **55** allows airflow to pass through the middle of the coil as well as along its sides.

[0100] Airflow passes through the air intake **58** on the lower surface of the floor housing **60** into a lower chamber **67**. The lower chamber **67** slows the air speed so that any particulates entrained within the airflow will drop out. The airflow then passes into the middle chamber **66**. After airflow is heated by the convection coil in the middle chamber **66**, the airflow passes along the convection heating coil **55** which is sealed within the coil holder **54** between the ceramic coil top spacer **61**, and the ceramic coil bottom spacer **64**. The middle chamber **66** is mounted to the lower frame **63** which extends from the lower housing **60**. A screen coil cover **62** has perforations that prevent plant or herb material from falling out of the upper chamber **65** into the middle chamber **66**. The urban material is in the upper chamber **65**. The screen coil cover **62** is preferably stainless steel but can be aluminum. The upper chamber **65** has a ceramic conduction heater **50** which defines the upper chamber **65**. The ceramic conduction heater **50** may have a lower grille which is ceramic and has openings allowing airflow to pass through from the convection heating coil **55**. The ceramic conduction heater **50** has trace of electric coils in the sidewalls which heat by resistance heating. The ceramic material of the ceramic conduction heater **50** receives heat and conducts it to the plant material. As the plant material vaporizes, the airflow passes upward through the mouthpiece gasket **42**, then through the mouthpiece tube **41** and finally out through the vapor exit **43**. As the mouthpiece tube **41** is sealed to the mouthpiece gasket **42** in a socket of the mouthpiece gasket **42**, the airflow does not leak out into the upper housing **30**, or the mouthpiece assembly **40**. Similarly, a silicone heater cover **57** at the air intake **58** prevents air from leaking into the lower housing. The airflow is linear and passes vertically parallel to the battery and the liquid crystal display.

[0101] Therefore, a key feature of the present invention is that the air is heated first by convection, then by conduction. The proportion of the convection and conduction is user controllable. When a user desires to have more convection heating, the user can control the convection using the buttons. Similarly, when a user desires to have more conduction heating, the user can control that as well. The user can also control the amount of heat and heat duration. Insulation tubing **51** encapsulates the sidewalls of the ceramic conduction heater **50** and the upper half of the convection heating coil **55**. The insulation tubing **51** can be fiberglass, mineral wool or the like.

[0102] The battery **20** does not power both the trace in the ceramic conduction heater **50** and the convection heating coil **55** at the same time. The battery **20** is controlled by the printed circuit board assembly **70** which switches the power based on a clock cycle. The clock cycle can be 10 kilohertz for example.

[0103] As seen in FIG. **11**, a coil timing system **90**, a clock **100** provides timing for a convection coil cycle **120** and a conduction coil cycle **121**. The convection coil has an activation input on a cycle that is offset by 180 degrees to the conduction coil cycle. A complete clock cycle has a high clock segment and a low clock segment comprising a total of 360 degrees. The coil timing system **90** begins with a convection coil first half of first clock cycle **91** where the convection coil is activated. The conduction coil first half of first clock cycle **92** deactivates the conduction coil. The clock first half of first clock cycle **93** is high. Then, the convection coil second half of first clock cycle **94** has a deactivation of the convection coil. The conduction coil second half of first clock cycle **95** is high which means that the conduction coil is activated. The conduction coil second half of first clock cycle **96** is low. That concludes the first cycle.

[0104] In the second cycle, the timing repeats. The convection coil first half of second clock cycle **97** is high, and the conduction coil first half of second clock cycle **98** is low because the clock first half of second clock cycle **99** is high. This mirrors the sequence from 360 degrees ago in the first cycle. Then, the value of the convection coil second half of second clock cycle **101** is high, and the value of the conduction coil second half of second clock cycle **102** is low. The clock second half of second clock cycle **103** is low. Again, in the third cycle, the timing repeats again. The convection coil first half of third clock cycle **104** is high, then low in the convection coil second half of third clock cycle **107**. This coordinates with the conduction coil value where the conduction coil first half of third clock cycle **105** is low and the conduction coil first second of third clock cycle **108** is high. The clock first half of third clock cycle **106** is high, and the clock second half of third clock cycle **109** is low. The coil timing system **90** can be implemented on the central processing unit **72**. The clock can be set at two kilohertz for example.

[0105] As seen in FIG. **12**, the central processing unit **72** can also implement a voltage and temperature control system **110**. A user input reference temperature **111** can be checked with a temperature comparator **117** which calculates an error that a temperature proportional integral derivative controller **119** uses to output a voltage reference to a voltage comparator **116** which then calculates an error which the voltage proportional integral derivative controller uses to generate a voltage output to a heating coil. The heating coil has a temperature sensor measurement **115** taken from the temperature sensor **52**, and the output of the voltage proportional integral derivative controller **118** has a voltage sensor measurement **114** from a voltage sensor. This provides a voltage feedback loop **112** inside a temperature feedback loop **113** which controls the temperature of the heating coil. The heating coil voltage output value is sent to power the convection heating coil **55** and the ceramic heater **50** alternatively on a 2 kHz alternating clock cycle for example.

[0106] The example given is for a 50% convection and 50% conduction profile. The voltage cycle frequency is at a higher frequency than the temperature cycle frequency. The voltage cycle frequency can be set at 62.5 Hz and the temperature cycle frequency set at 10 Hz. The thermocouple temperature sensor is preferably attached to the ceramic cup of the ceramic heater **50**. The ceramic heater **50** preferably has a cylindrical body with a cylindrical opening for receiving the head of the thermocouple with a pair of legs extending from the thermocouple and out of the ceramic cup of the ceramic heater **50**. The thermocouple can be integrally formed with the ceramic sidewall of the ceramic heater **50**. Alternatively, two separate control systems can be used for controlling the convection heating coil **55** and the ceramic heater **50** separately, but still using the same temperature reference input.

[0107] FIGS. **1-8** show the exterior of the electronic vaporizer. From the exterior, the user does not see that the device has both a conduction and convection heater, however the user can check the status of the conduction and convection heater on the display screen. The user can control each heater individually and can set a desired temperature and then a percentage for each heater. The display screen on default preferably shows 50% conduction and 50% convection. The percentage can vary from 0 to 100 degrees in 10 degrees increments for example. Both will add up to 100%. For example, the temperature can be set to 180° C. with the conduction heater at 20% and the convection heater at 80%. The display screen will have a temperature with a countdown timer, the conduction percentage, convection percentage, battery indicator, and a vibration on-off symbol. The power and fire button, increase temperature button and decrease temperature button are all grouped together around the display screen.

[0108] By using different combinations of the buttons, the user can turn on the device, turn off the device, set the temperature, turn on the heat, turn off the heat, extend the session timer by 30 seconds, reset, change the units of the temperature, activate a stealth mode, and turn on and off a vibration. The device settings preferably have a temperature between 115° C. and 221° C. with a timer of five minutes and time extensions of 30 seconds each up to an additional five minutes. The default starting temperature is preferably 176° C. which is 350° F., with a default conduction heater utilization percentage of 50% and a default convection heater utilization percentage of 50%. The utilization percentage ratios correspond to a set activation timing pattern with the simplest timing pattern being alternation on every clock cycle.

[0109] The default values can be stored based on the last settings before powering off the device. By changing the variation of heat distribution between conduction and convection, a user can change the quality of the vapor depending upon user tastes and depending upon the herbal material or other articles being vaporized. Conduction preferably has a faster heating and uses less power, but may not be as easily vaporized and as flavorful as convection heating.

[0110] By combining the electronically controlled two heaters, the user has the ability to customize their vaporization session as they please. If the user were to modify the heat so that the heat was 30% conduction and 70% convection, the clock cycle could have three half cycles of conduction heating for every seven cycles of convection heating. The **30** to **70** ratio pattern may be conduction, convection, convection, conduction, convection, convection, convection, conduction, convection, and convection in that order where each conduction heating signal pulse is followed by three or four pulses of convection heating signal pulses.

1. An electronic vaporizer comprising:

a. a battery;

b. a set of controls;

c. a first heater activated by the set of controls;

d. a middle chamber heated by the first heater, wherein an airflow is configured to pass through the middle chamber;

e. a second heater activated by the set of controls;

f. an upper chamber heated by the second heater, wherein the airflow is configured to pass through the upper chamber from the middle chamber;

g. a mouthpiece tube, wherein the mouthpiece tube is connected to the upper chamber, wherein the airflow passes through the mouthpiece tube; and

h. a processor, wherein the processor is configured with a timing program which distributes battery power alternatively between the first heater the second heater according to a clock having a clock frequency;

i. a control system, wherein the control system has a voltage loop inside a temperature loop for controlling both the voltage and the temperature of the heating coil, wherein the control system further includes a temperature sensor and a voltage sensor.

2. The electronic vaporizer of claim **1**, wherein the temperature sensor is a thermocouple that is mounted in the second heater.

3. The electronic vaporizer of claim **1**, wherein the mouthpiece tube is made of glass and has spiral indentations to promote a vortex flow.

4. The electronic vaporizer of claim **1**, wherein the mouthpiece tube seals to a mouthpiece gasket, wherein the mouthpiece gasket is mounted to a mouthpiece assembly, wherein the mouthpiece assembly has a magnetic connection to an upper housing, wherein the upper housing is connected to a lower housing, wherein the battery is mounted between the upper housing and lower housing.

5. The electronic vaporizer of claim **1**, further including a lower chamber, wherein the lower chamber has an air intake formed on a lower housing, and further comprising a lower frame, wherein the middle chamber and the upper chamber are mounted to the middle frame, and further comprising a silicone heater cover sandwiched between the lower housing and the lower frame.

6. The electronic vaporizer of claim **1**, wherein the timing program has a clock cycle greater than 100 Hz, wherein the clock cycle has a high half and a low half, wherein either the first heater or the second heater is activated in the high half, and wherein either the first heater or the second heater is activated in the low half, wherein if the first heater is activated in the high half, the first heater is not activated again in the low half.

7. The electronic vaporizer of claim **1**, wherein the first heater is a convection heater, and wherein the second heater is a conduction heater.

8. The electronic vaporizer of claim **7**, wherein the conduction heater is a ceramic heater has a ceramic body.

9. The electronic vaporizer of claim **7**, wherein the convection heater has a convection heater coil, wherein the airflow passes through the convection heater coil.

10. The electronic vaporizer of claim **9**, wherein the temperature sensor is a thermocouple that is mounted in the second heater.

11. The electronic vaporizer of claim **9**, wherein the mouthpiece tube is made of glass and has spiral indentations to promote a vortex flow.

12. The electronic vaporizer of claim **9**, wherein the mouthpiece tube seals to a mouthpiece gasket, wherein the mouthpiece gasket is mounted to a mouthpiece assembly, wherein the mouthpiece assembly has a magnetic connection to an upper housing, wherein the upper housing is connected to a lower housing, wherein the battery is mounted between the upper housing and lower housing.

13. The electronic vaporizer of claim **9**, further including a lower chamber, wherein the lower chamber has an air intake formed on a lower housing, and further comprising a lower frame, wherein the middle chamber and the upper chamber are mounted to the middle frame, and further comprising a silicone heater cover sandwiched between the lower housing and the lower frame.

14. The electronic vaporizer of claim **9**, wherein the timing program has a clock cycle greater than 100 Hz, wherein the clock cycle has a high half and a low half, wherein either the first heater or the second heater is activated in the high half, and wherein either the first heater or the second heater is activated in the low half, wherein if the first heater is activated in the high half, the first heater is not activated again in the low half.

15. The electronic vaporizer of claim **1**, wherein the temperature sensor is a thermocouple that is mounted in the second heater, wherein the timing program has a clock cycle greater than 100 Hz, wherein the clock cycle has a high half and a low half, wherein either the first heater or the second heater is activated in the high half, and wherein either the first heater or the second heater is activated in the low half, wherein if the first heater is activated in the high half, the first heater is not activated again in the low half.

16. The electronic vaporizer of claim **1**, wherein the mouthpiece tube is made of glass and has spiral indentations to promote a vortex flow, wherein the mouthpiece tube seals to a mouthpiece gasket, wherein the mouthpiece gasket is mounted to a mouthpiece assembly, wherein the mouthpiece assembly has a magnetic connection to an upper housing, wherein the upper housing is connected to a lower housing, wherein the battery is mounted between the upper housing and lower housing.

17. The electronic vaporizer of claim **1**, wherein the timing program alternates between heating the upper chamber and heating the lower chamber at a clock cycle greater than 10 Hz when the timing program is set for half convection heating and half conduction heating.

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