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(54) **DEVICE THAT TREATS FOOD WITH MULTIPLE WAVELENGTHS OFLIGHT**

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(52) **U.S. Cl.**
CPC ***A23B 2/53*** (2025.01)

(57) **ABSTRACT**

A device that treats food with multiple wavelengths of light to provide a beneficial effect when the treated food is consumed. The device may emit at least three different wavelengths that are selected from specific wavelength combinations that have been found to have synergistic and positive effects. Treating food with these wavelengths may increase the energy content of the food, and specific types and levels of energy corresponding to the treatment wavelengths may be radiated into a person's body when the food is consumed.

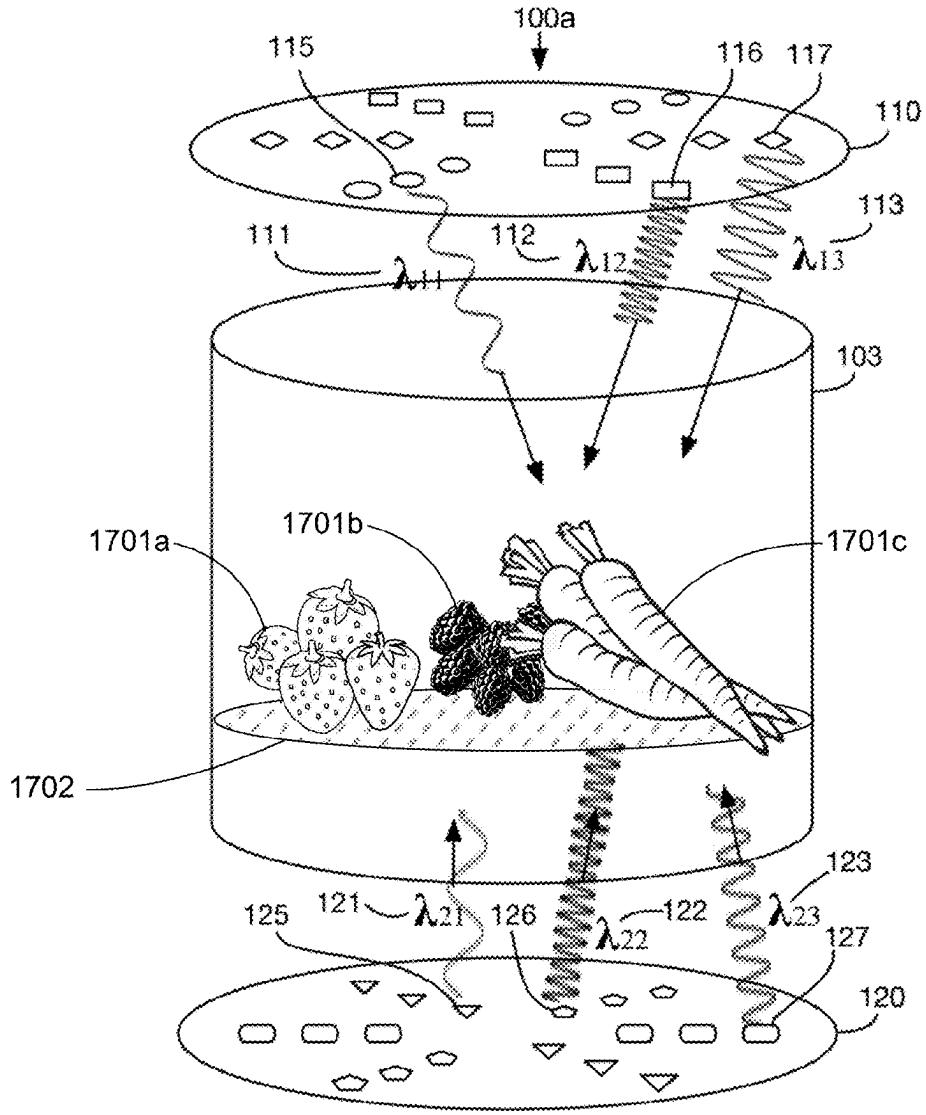


FIG. 1

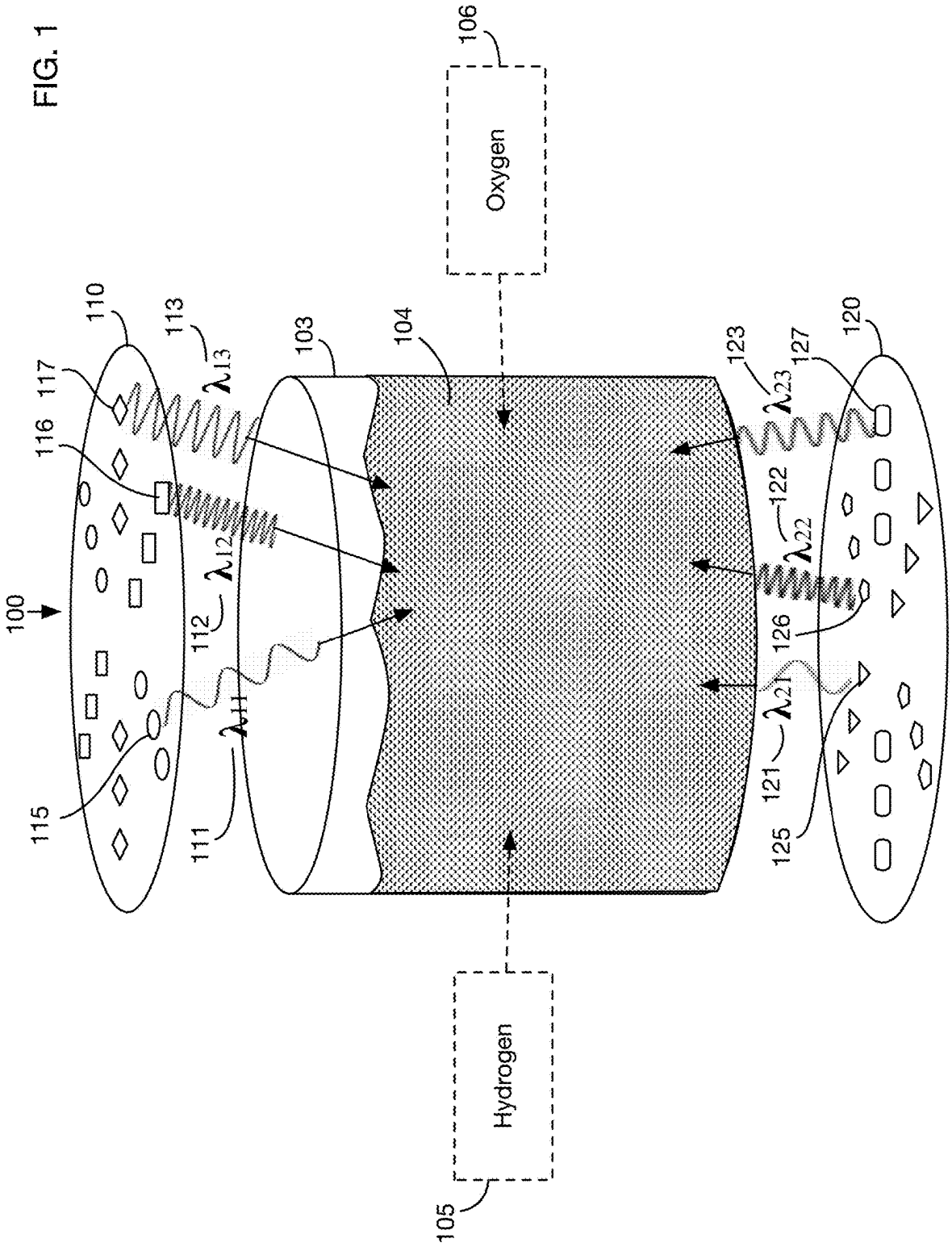

106
Oxygen
110
113
λ_{13}
103
104
123
λ_{23}
127
120
117
116
122
λ_{22}
λ_{12}
100
112
126
λ_{11}
λ_{21}
121
115
111
125
Hydrogen
105

FIG. 2

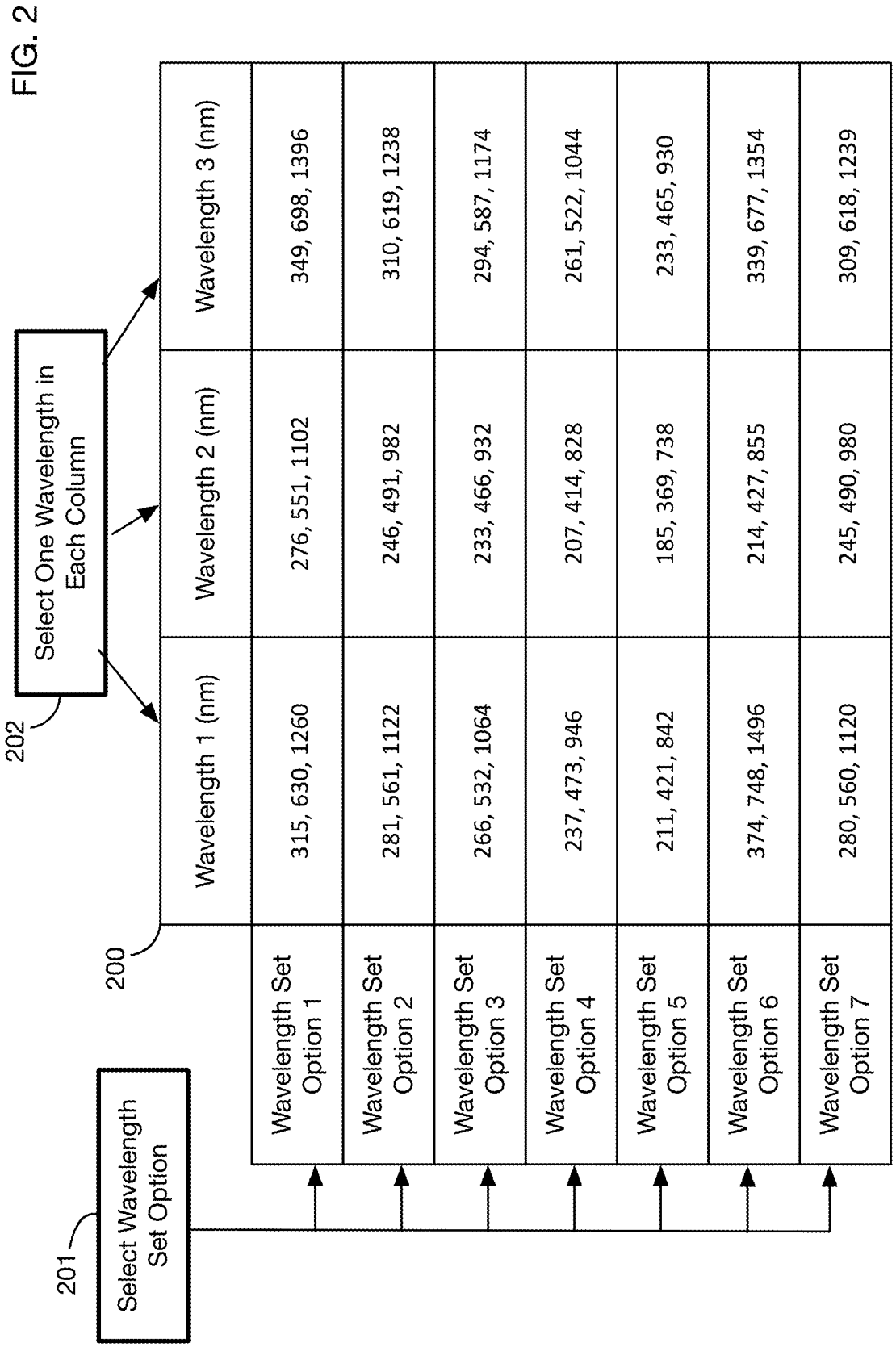

201
Select Wavelength Set Option
200
202
Select One Wavelength in Each Column
Wavelength 1 (nm)
Wavelength 2 (nm)
Wavelength 3 (nm)
Wavelength Set Option 1
315, 630, 1260
276, 551, 1102
349, 698, 1396
Wavelength Set Option 2
281, 561, 1122
246, 491, 982
310, 619, 1238
Wavelength Set Option 3
266, 532, 1064
233, 466, 932
294, 587, 1174
Wavelength Set Option 4
237, 473, 946
207, 414, 828
261, 522, 1044
Wavelength Set Option 5
211, 421, 842
185, 369, 738
233, 465, 930
Wavelength Set Option 6
374, 748, 1496
214, 427, 855
339, 677, 1354
Wavelength Set Option 7
280, 560, 1120
245, 490, 980
309, 618, 1239

FIG. 3

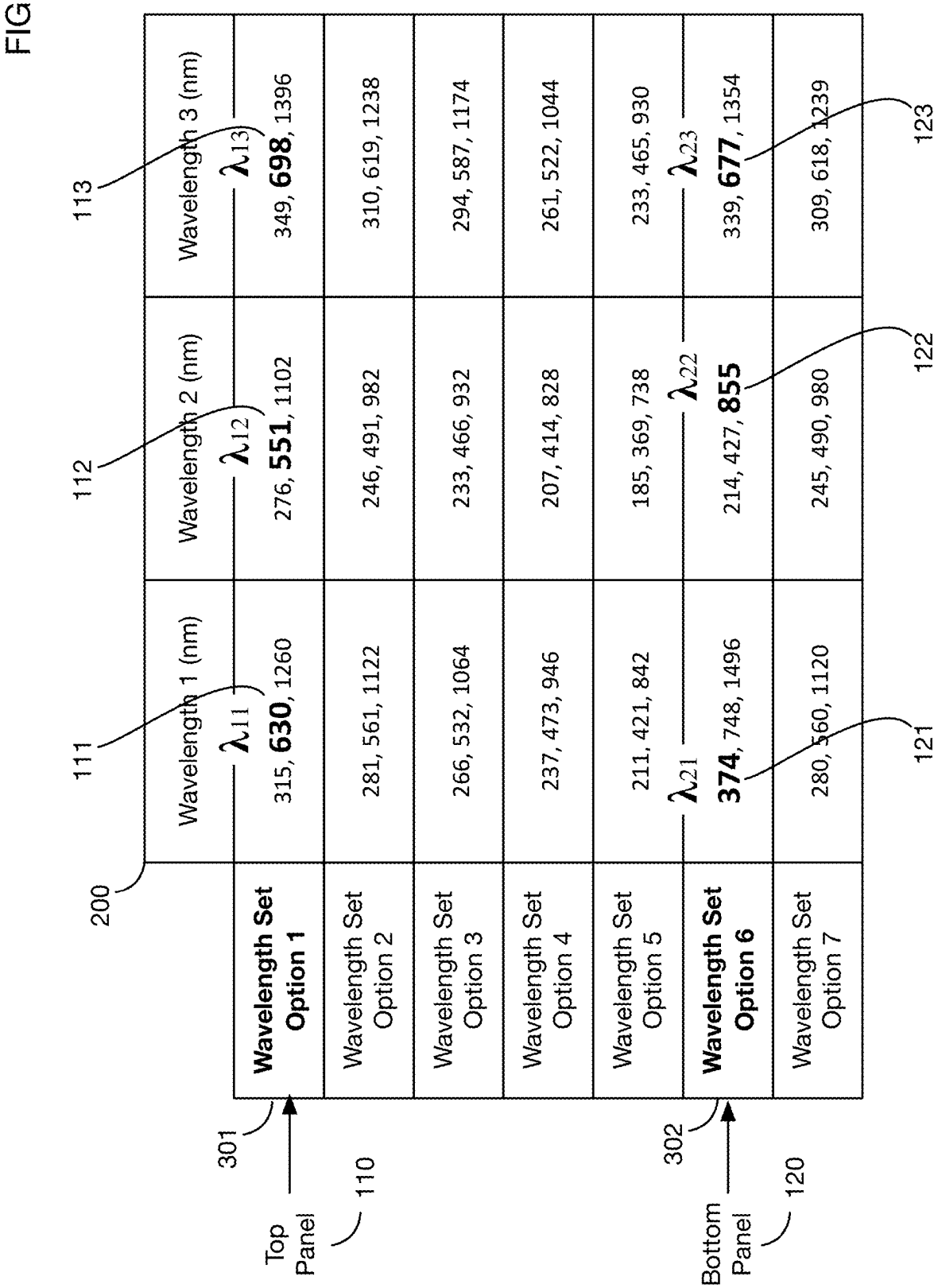

200
111
112
113
Wavelength 1 (nm)
Wavelength 2 (nm)
Wavelength 3 (nm)
λ11
λ12
λ13
λ21
λ22
λ23
Wavelength Set Option 1
315, 630, 1260
276, 551, 1102
349, 698, 1396
Wavelength Set Option 2
281, 561, 1122
246, 491, 982
310, 619, 1238
Wavelength Set Option 3
266, 532, 1064
233, 466, 932
294, 587, 1174
Wavelength Set Option 4
237, 473, 946
207, 414, 828
261, 522, 1044
Wavelength Set Option 5
211, 421, 842
185, 369, 738
233, 465, 930
Wavelength Set Option 6
374, 748, 1496
214, 427, 855
339, 677, 1354
Wavelength Set Option 7
280, 560, 1120
245, 490, 980
309, 618, 1239
121
122
123
301
302
Top Panel
110
Bottom Panel
120

FIG. 4

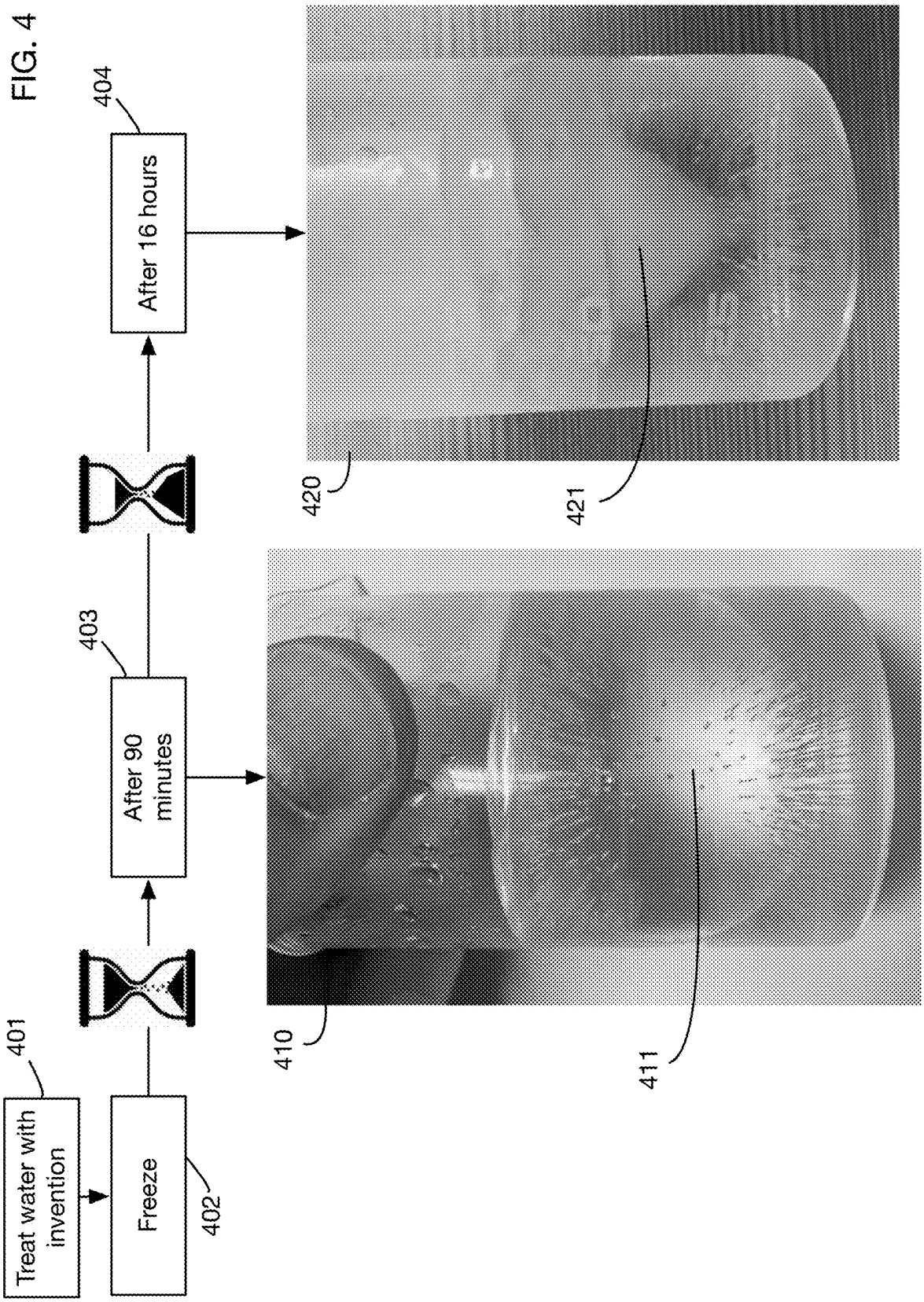

Treat water with invention
401
Freeze
402
After 90 minutes
403
After 16 hours
404
410
411
420
421

FIG. 5

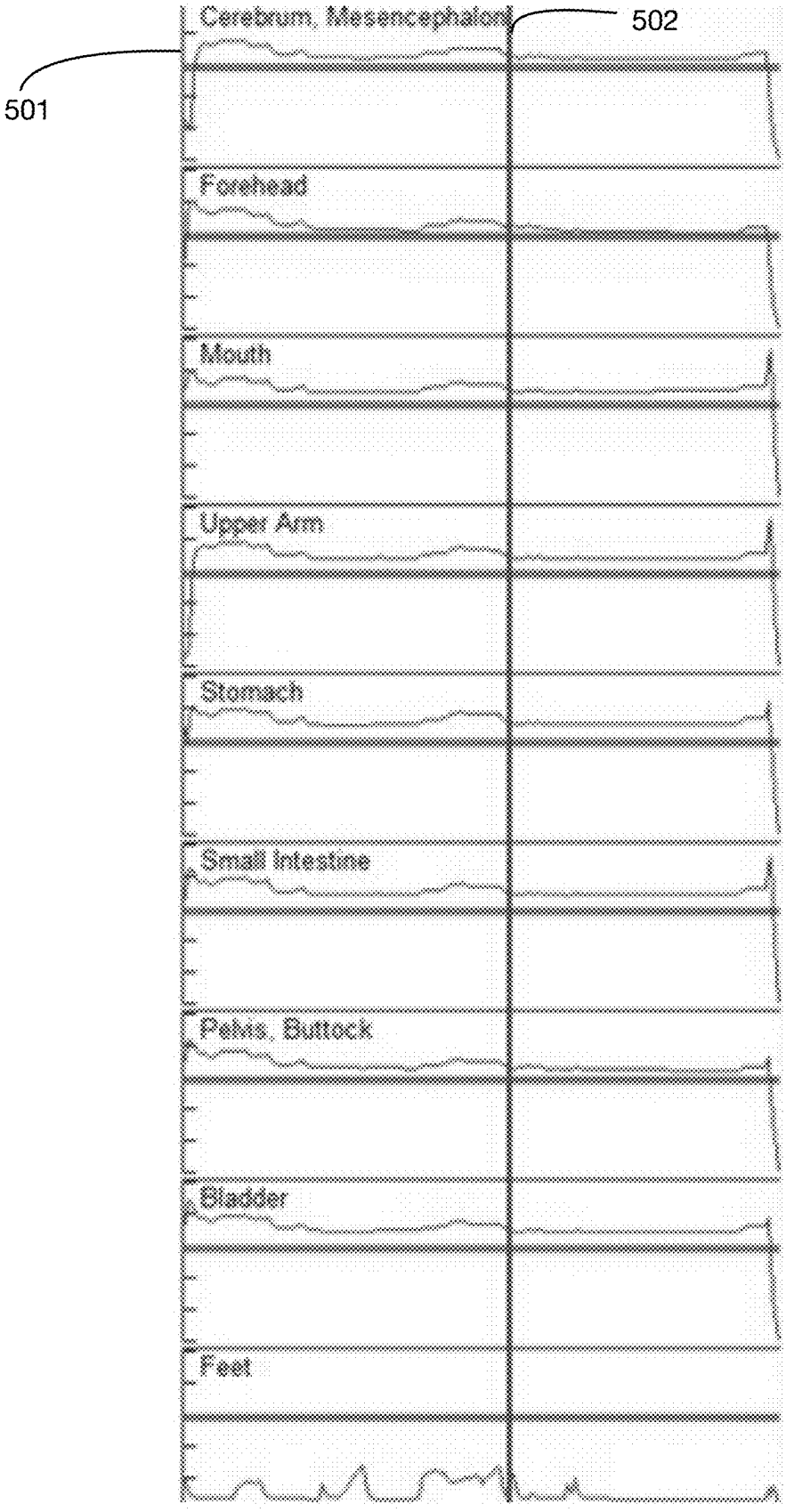

501
502
Cerebrum, Mesencephalon
Forehead
Mouth
Upper Arm
Stomach
Small Intestine
Pelvis, Buttock
Bladder
Feet

FIG. 6

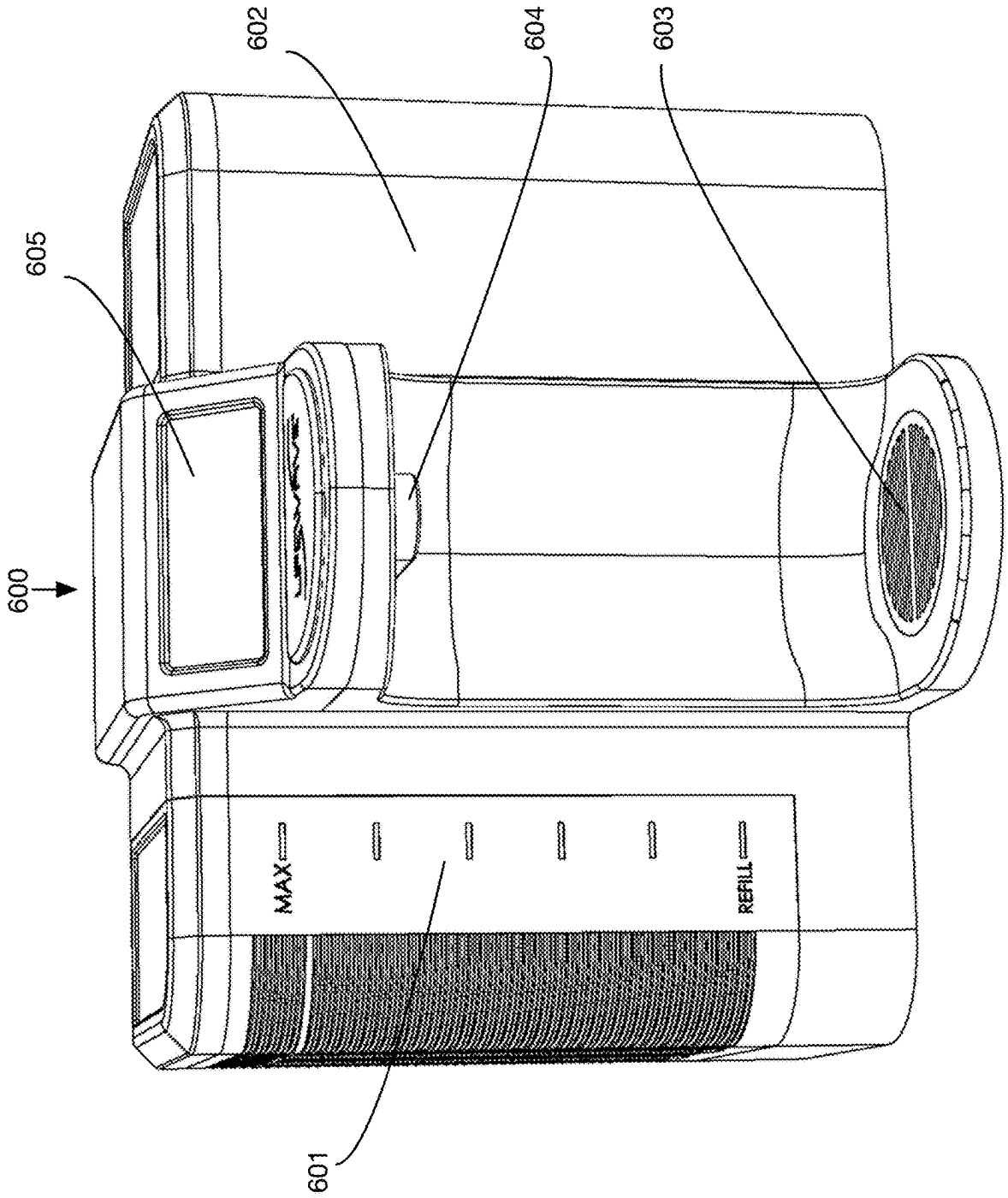


FIG. 7

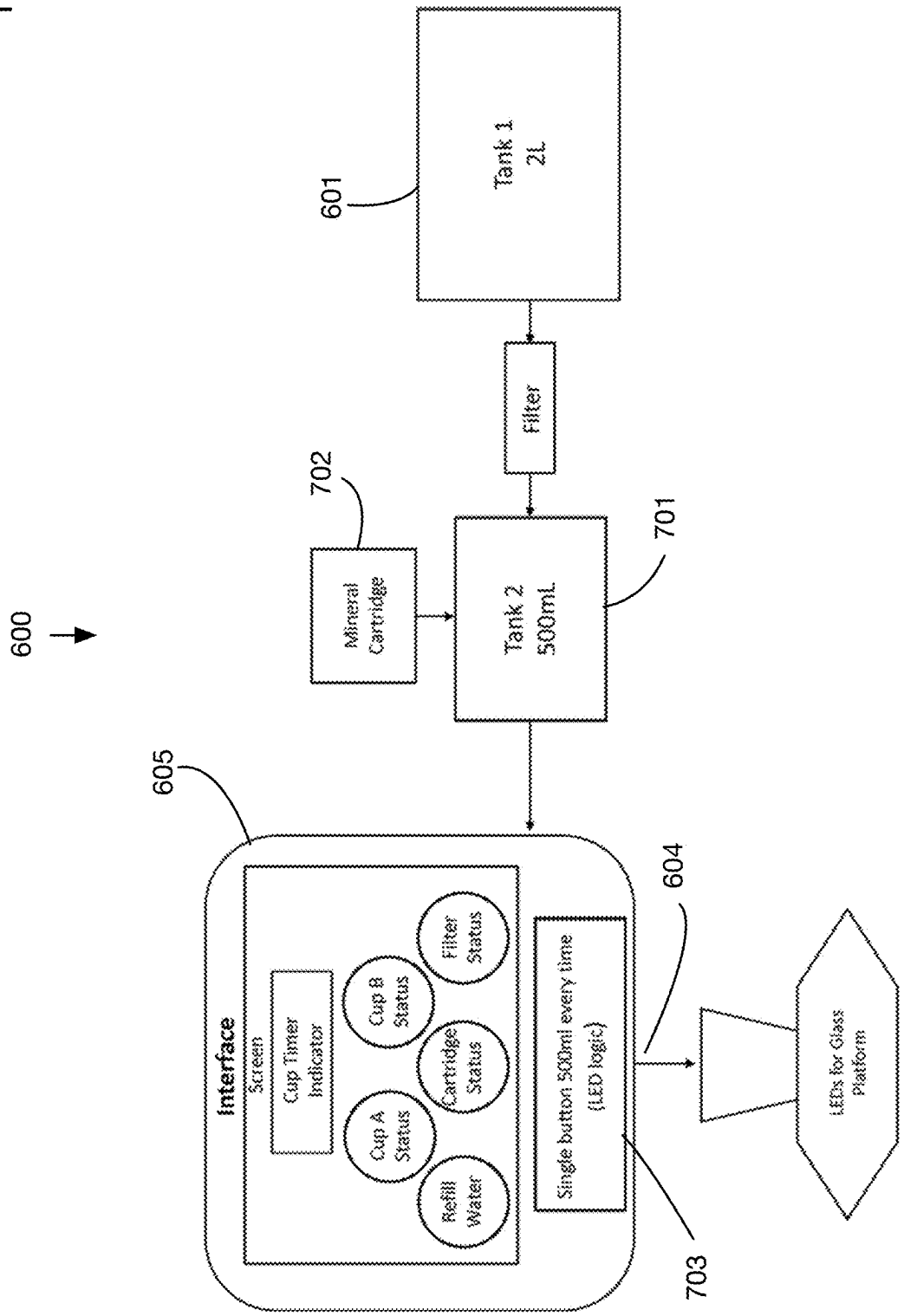

600
601
Tank 1
2L
Filter
702
Mineral Cartridge
Tank 2
500mL
701
605
Interface
Screen
Cup Timer Indicator
Cup B Status
Filter Status
Cup A Status
Cartridge Status
Refill Water
Single button 500ml every time (LED logic)
604
703
LEDs for Glass Platform

FIG. 8

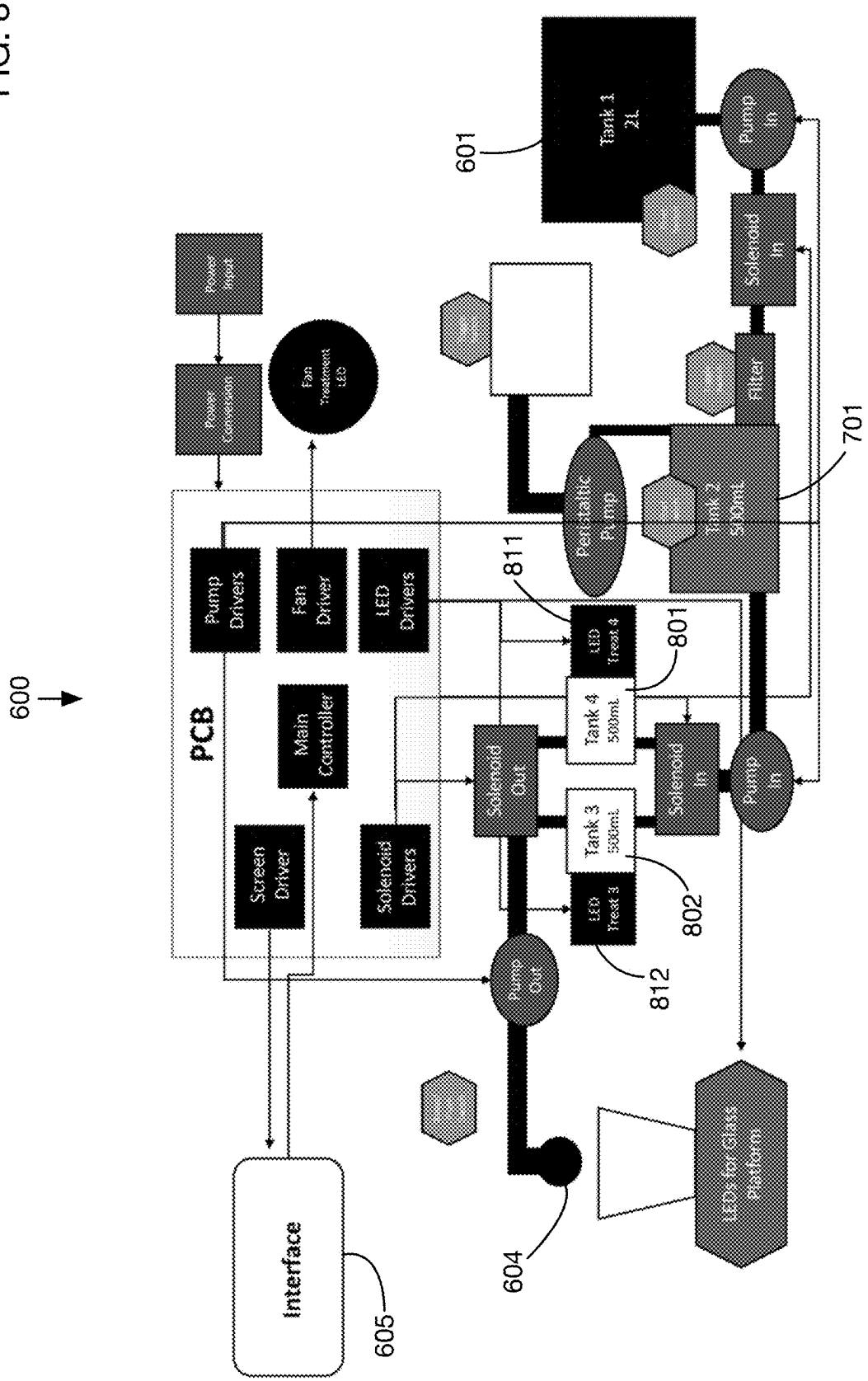

600
PCB
Pump Drivers
Fan Driver
LED Drivers
Main Controller
Screen Driver
Solenoid Drivers
Interface
605
Power Input
Power Conversion
Fan Treatment LED
601
Tank 1 2L
Pump In
Solenoid In
Filter
701
Peristaltic Pump
Tank 2 500mL
811
LED Treat 4
801
Tank 4 500mL
Solenoid Out
Solenoid In
Pump In
Tank 3 500mL
LED Treat 3
802
812
Pump Out
604
LED for Glass Platform

FIG. 9

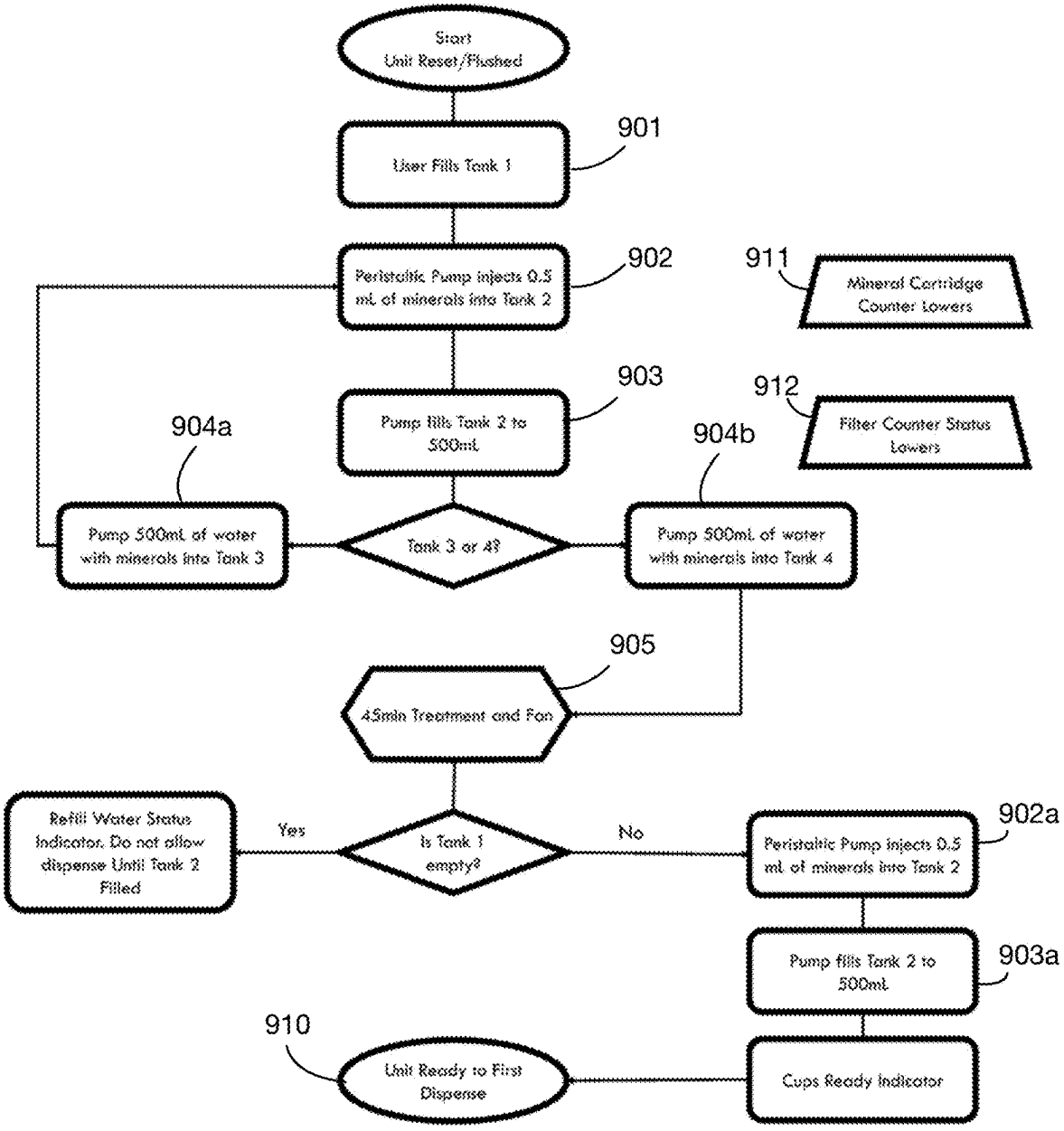

Start
Unit Reset/Flushed
User Fills Tank 1
901
Peristaltic Pump injects 0.5 mL of minerals into Tank 2
902
911
Mineral Cartridge Counter Lowers
Pump fills Tank 2 to 500mL
903
912
Filter Counter Status Lowers
904a
904b
Pump 500mL of water with minerals into Tank 3
Tank 3 or 4?
Pump 500mL of water with minerals into Tank 4
905
45min Treatment and Fan
Refill Water Status Indicator. Do not allow dispense Until Tank 2 Filled
Yes
Is Tank 1 empty?
No
Peristaltic Pump injects 0.5 mL of minerals into Tank 2
902a
Pump fills Tank 2 to 500mL
903a
910
Unit Ready to First Dispense
Cups Ready Indicator

FIG. 10

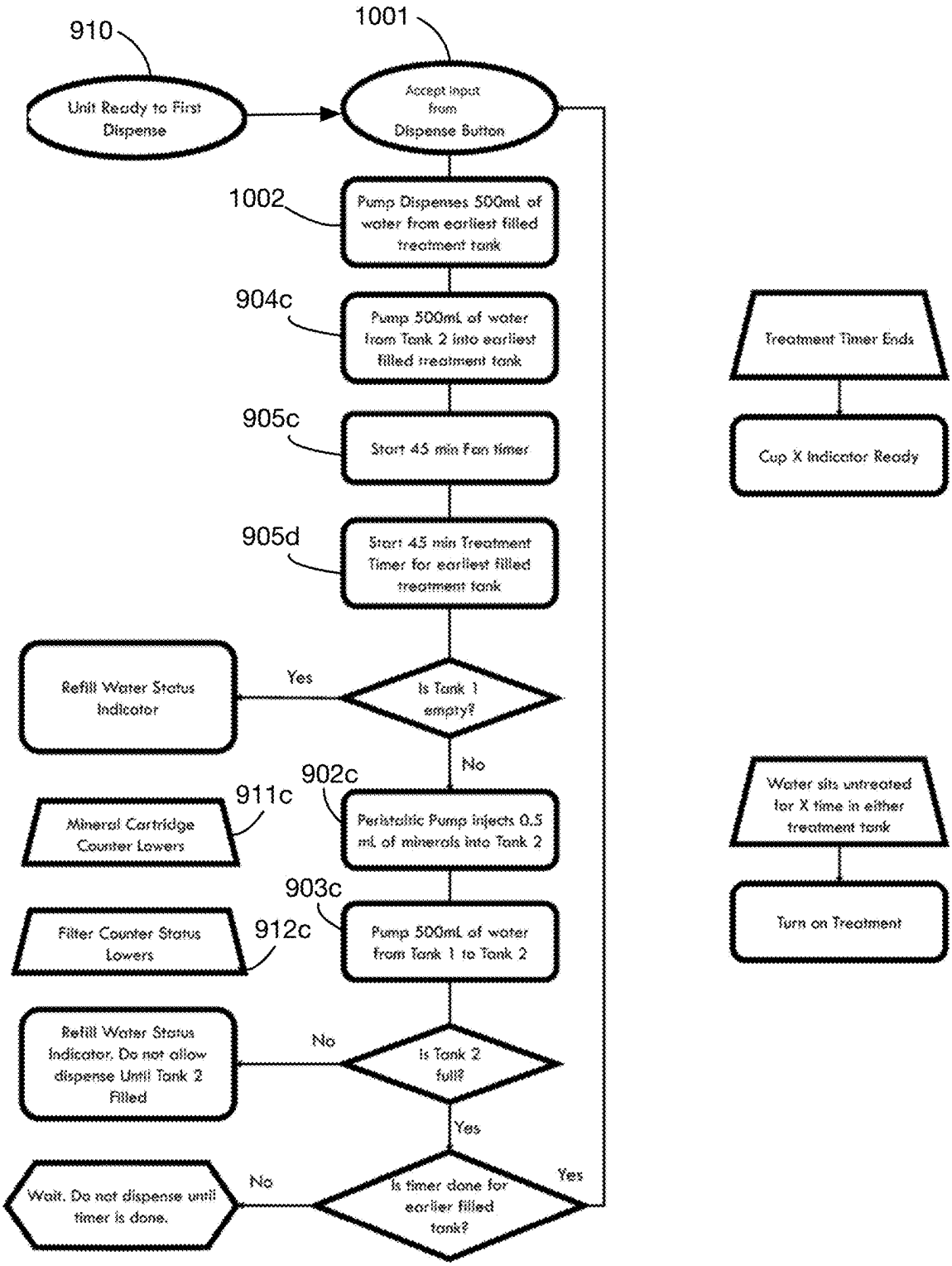

910
Unit Ready to First Dispense
1001
Accept Input from Dispense Button
1002
Pump Dispenses 500ml of water from earliest filled treatment tank
904c
Pump 500mL of water from Tank 2 into earliest filled treatment tank
905c
Start 45 min Fan timer
905d
Start 45 min Treatment Timer for earliest filled treatment tank
Refill Water Status Indicator
Yes
Is Tank 1 empty?
No
902c
911c
Mineral Cartridge Counter Lowers
Peristaltic Pump injects 0.5 ml of minerals into Tank 2
903c
912c
Filter Counter Status Lowers
Pump 500mL of water from Tank 1 to Tank 2
Refill Water Status Indicator. Do not allow dispense Until Tank 2 Filled
No
Is Tank 2 full?
Yes
Wait. Do not dispense until timer is done.
No
Is timer done for earlier filled tank?
Yes
Treatment Timer Ends
Cup X Indicator Ready
Water sits untreated for X time in either treatment tank
Turn on Treatment

FIG. 11

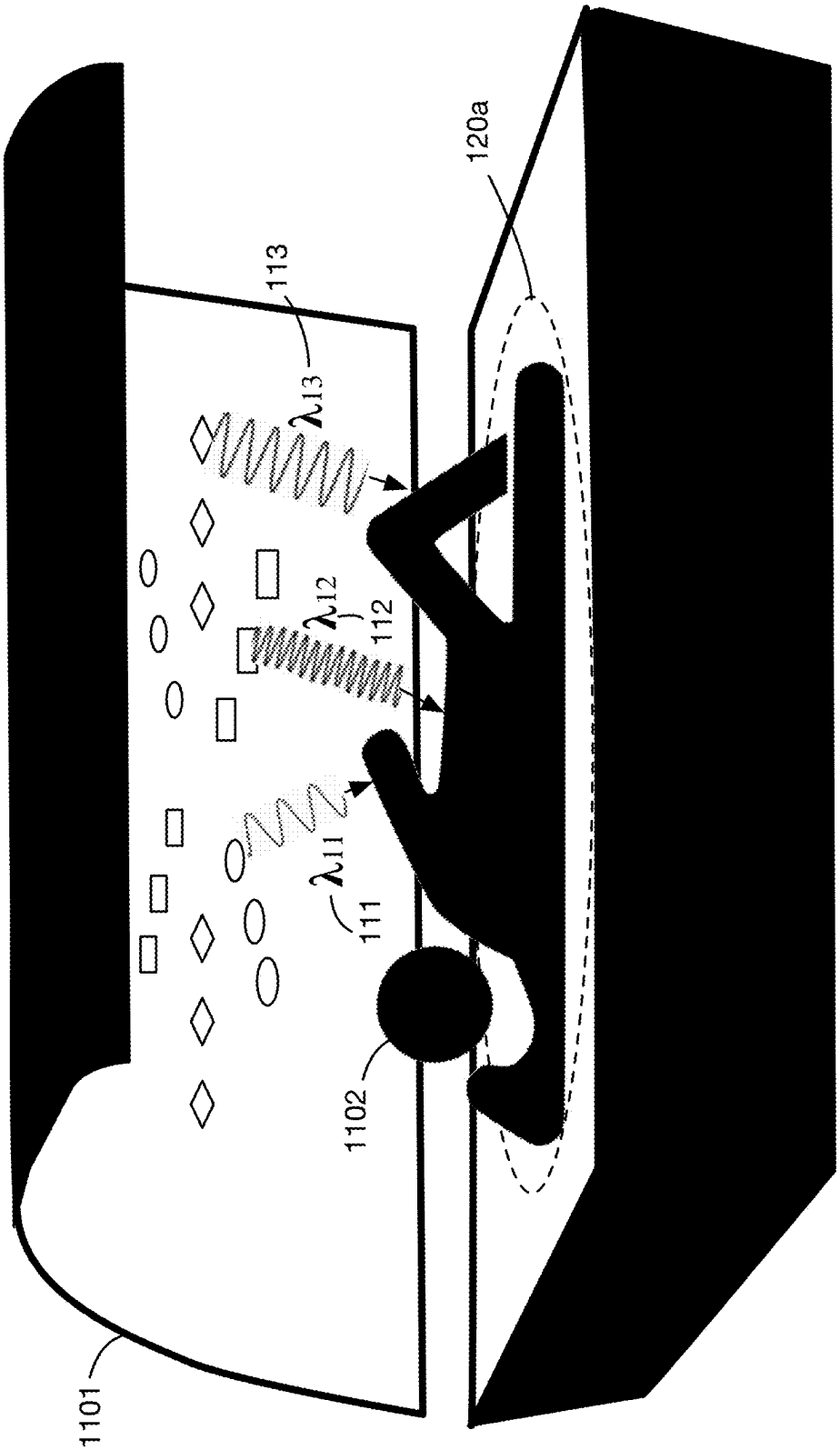


FIG. 12

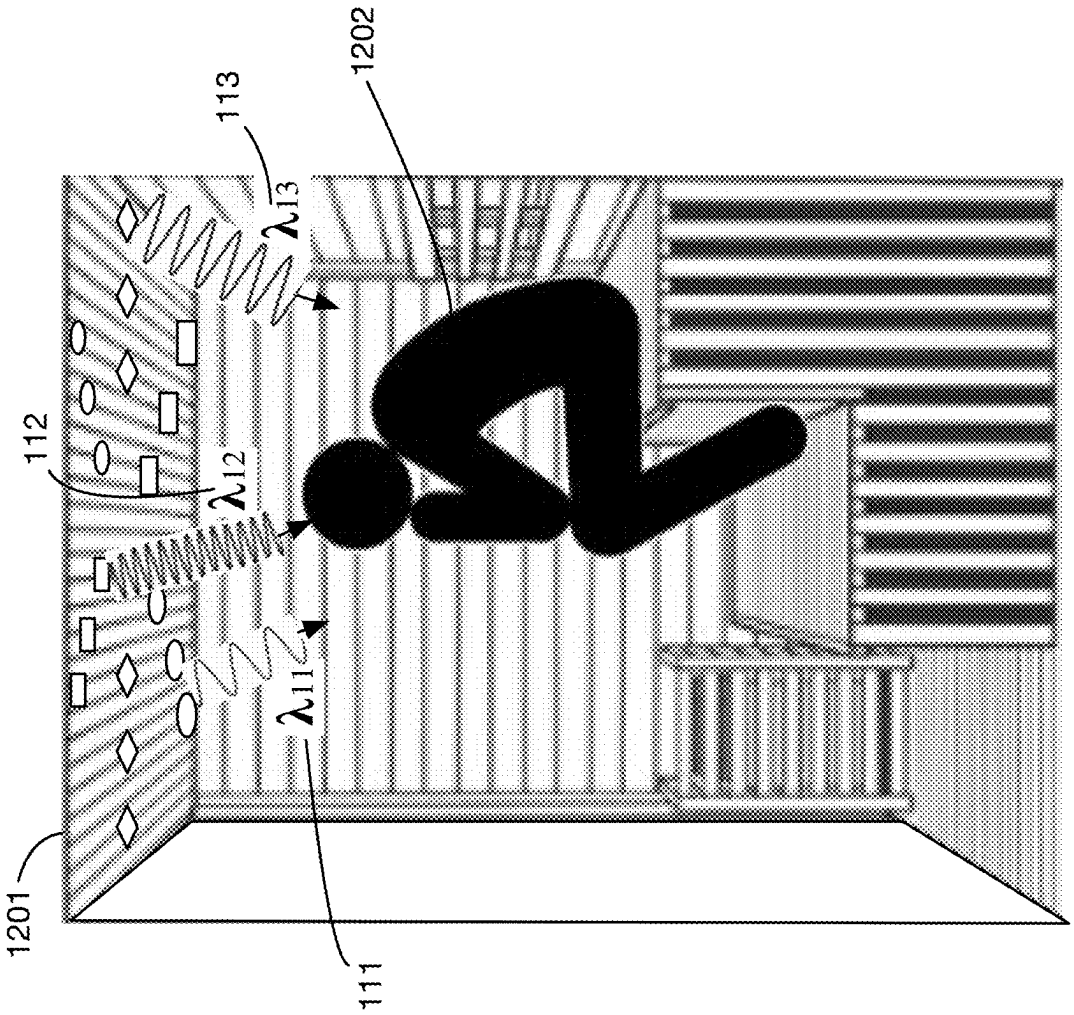


FIG. 13

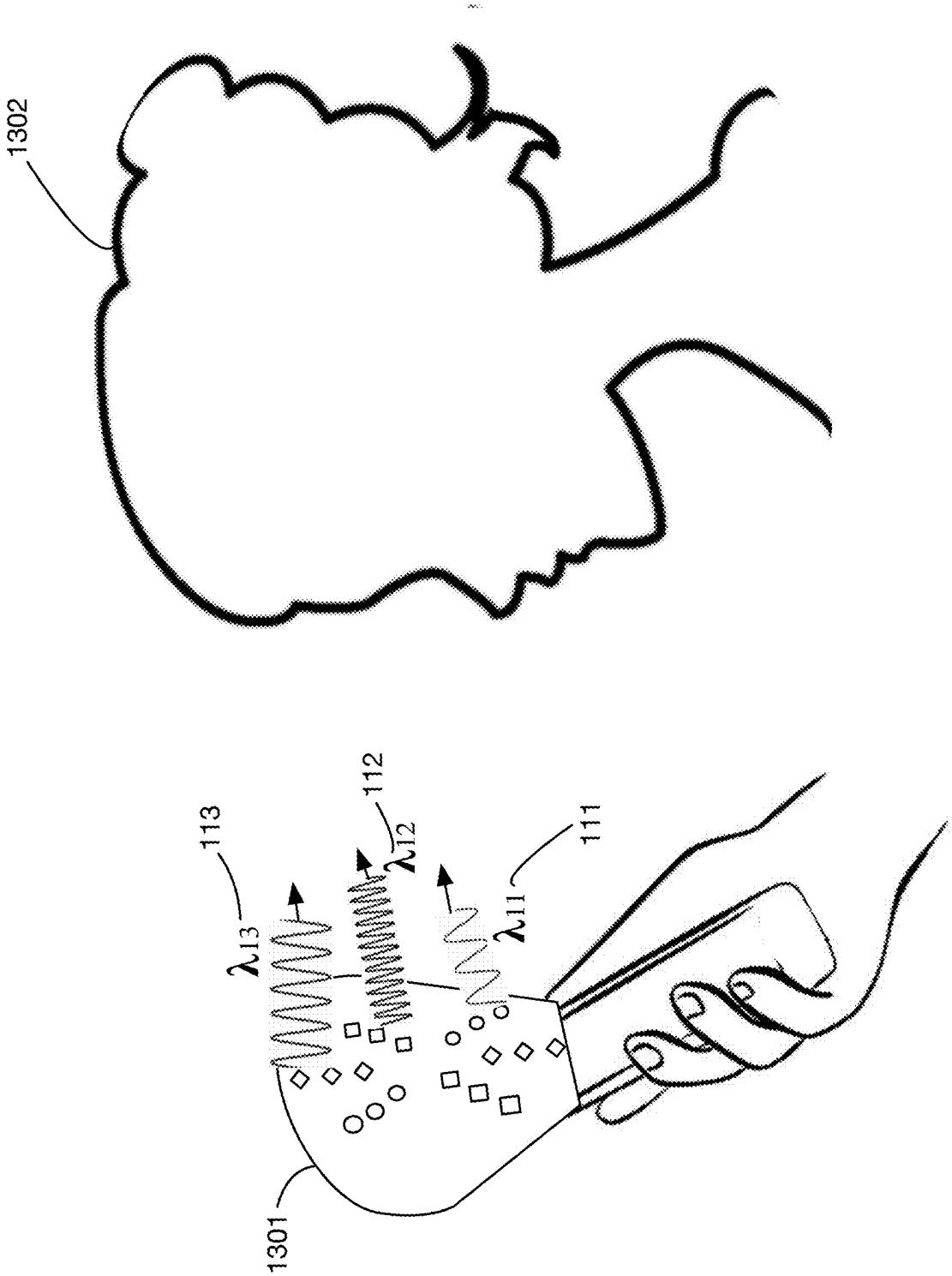


FIG. 14

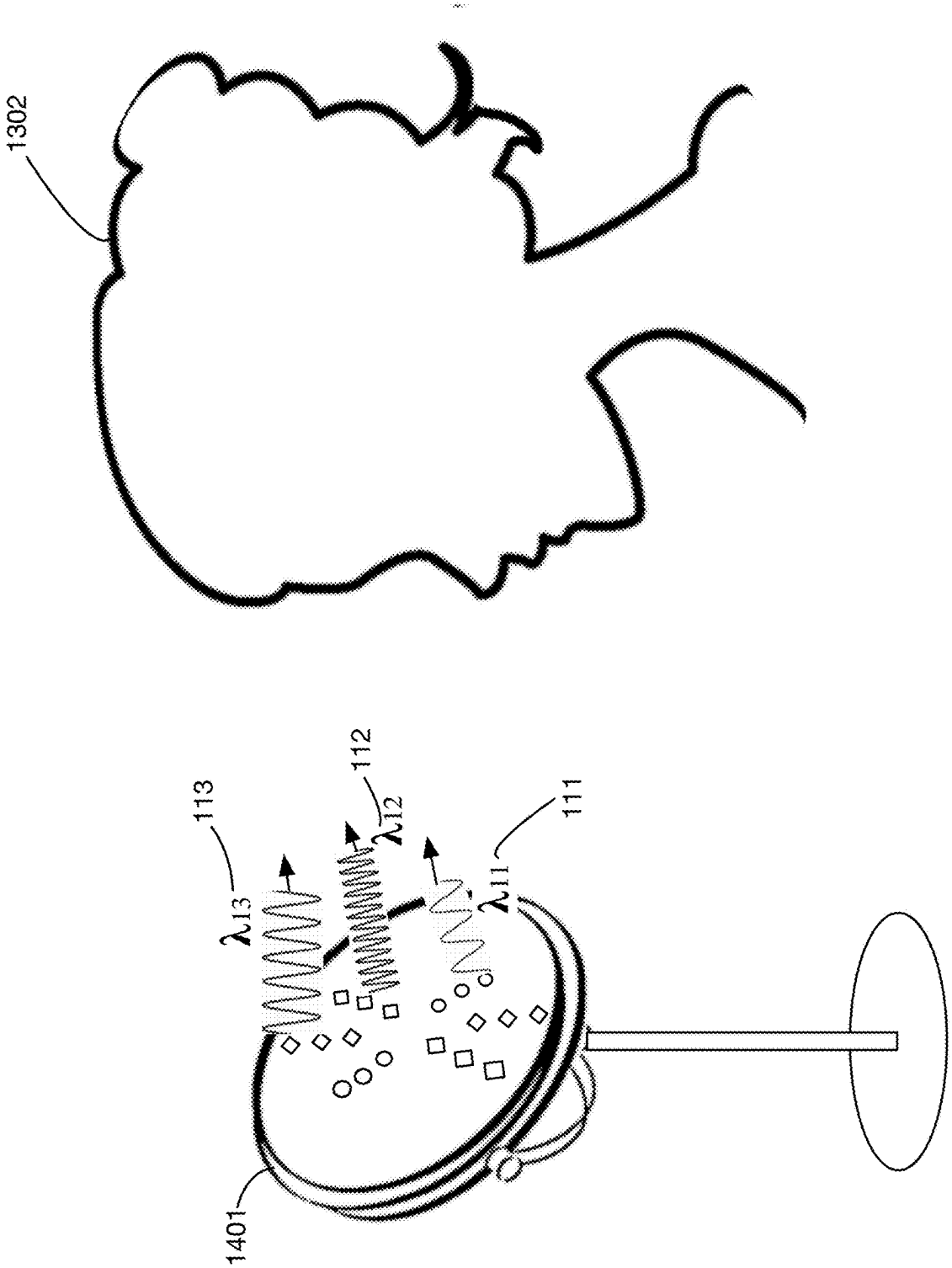


FIG. 15

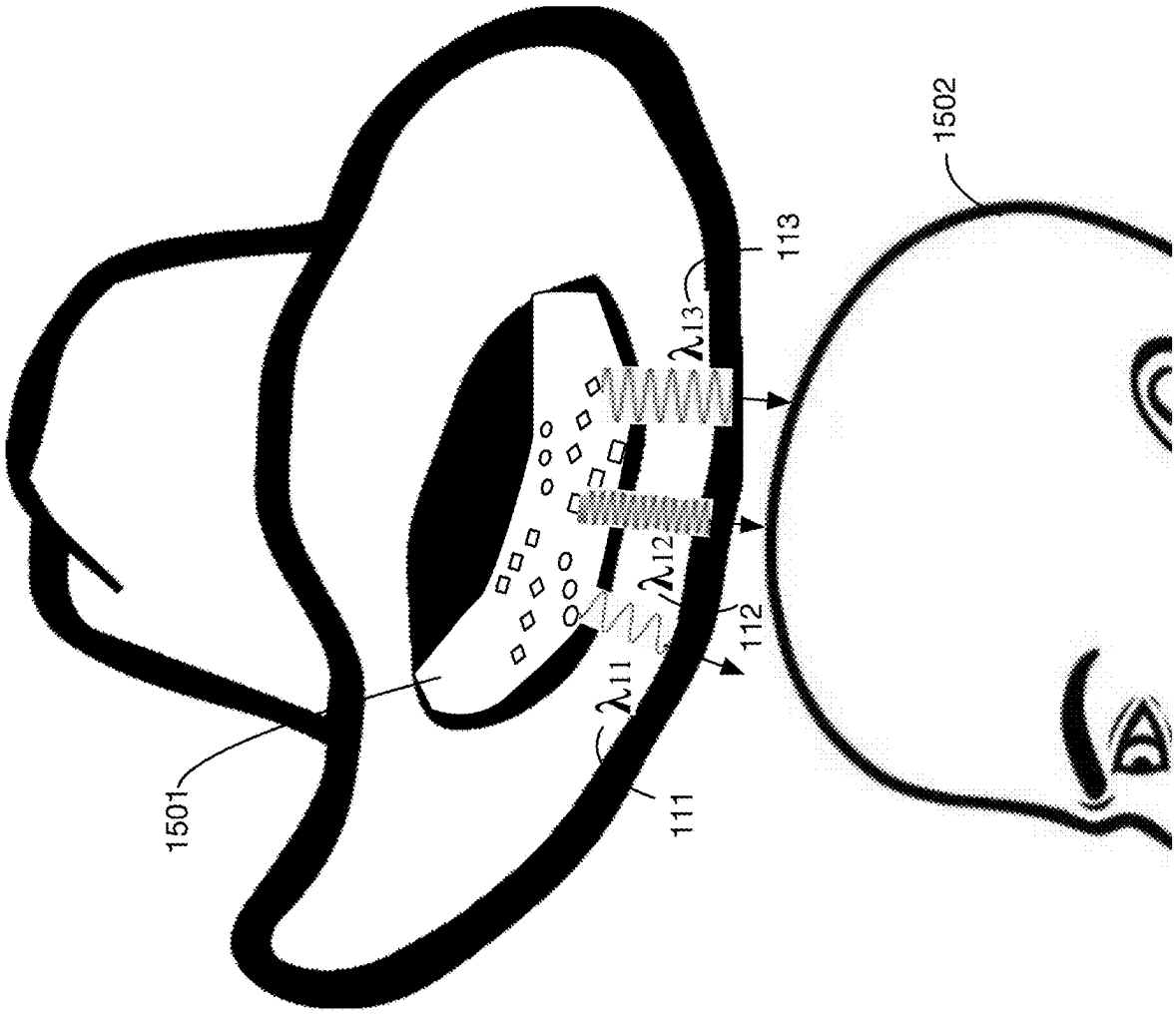


FIG. 16

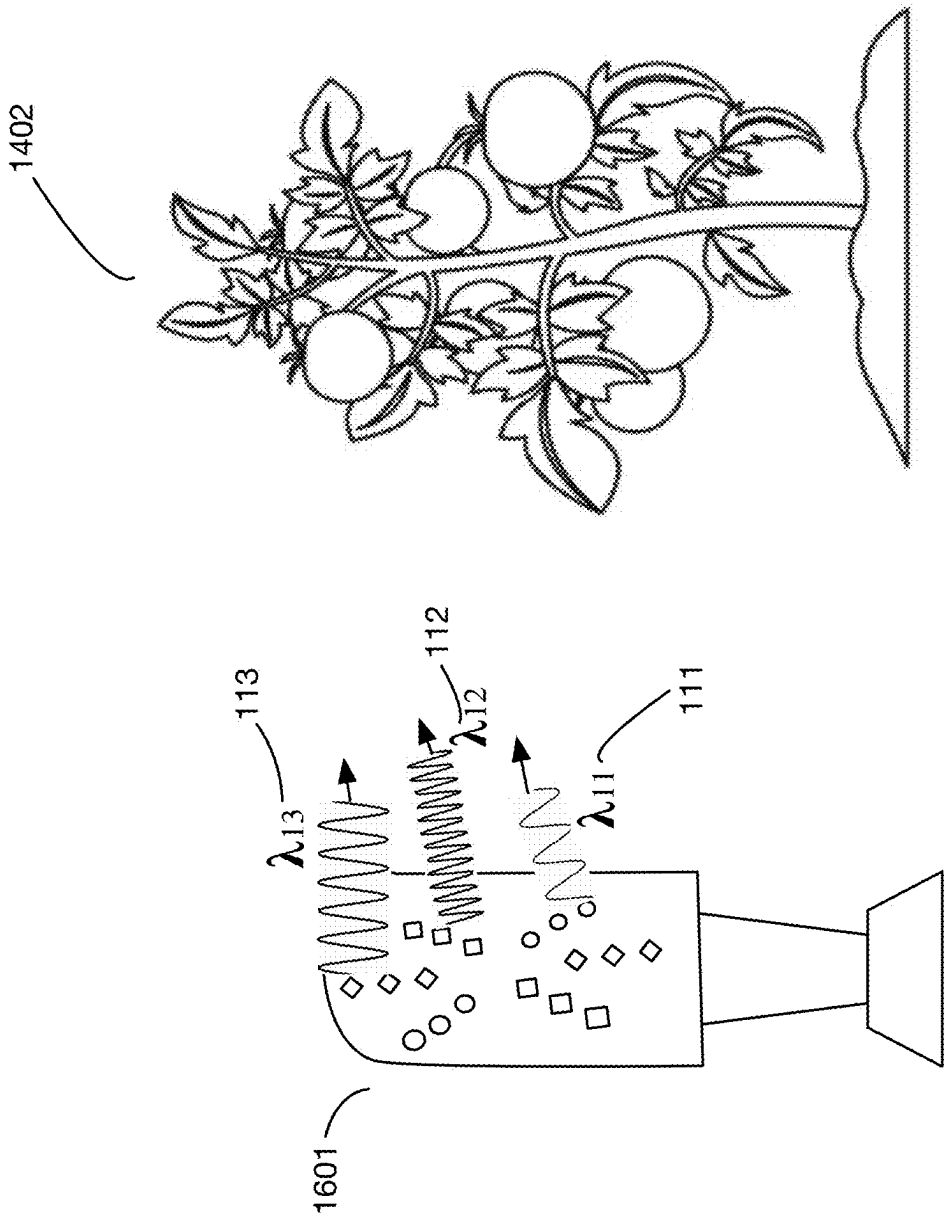


FIG. 17

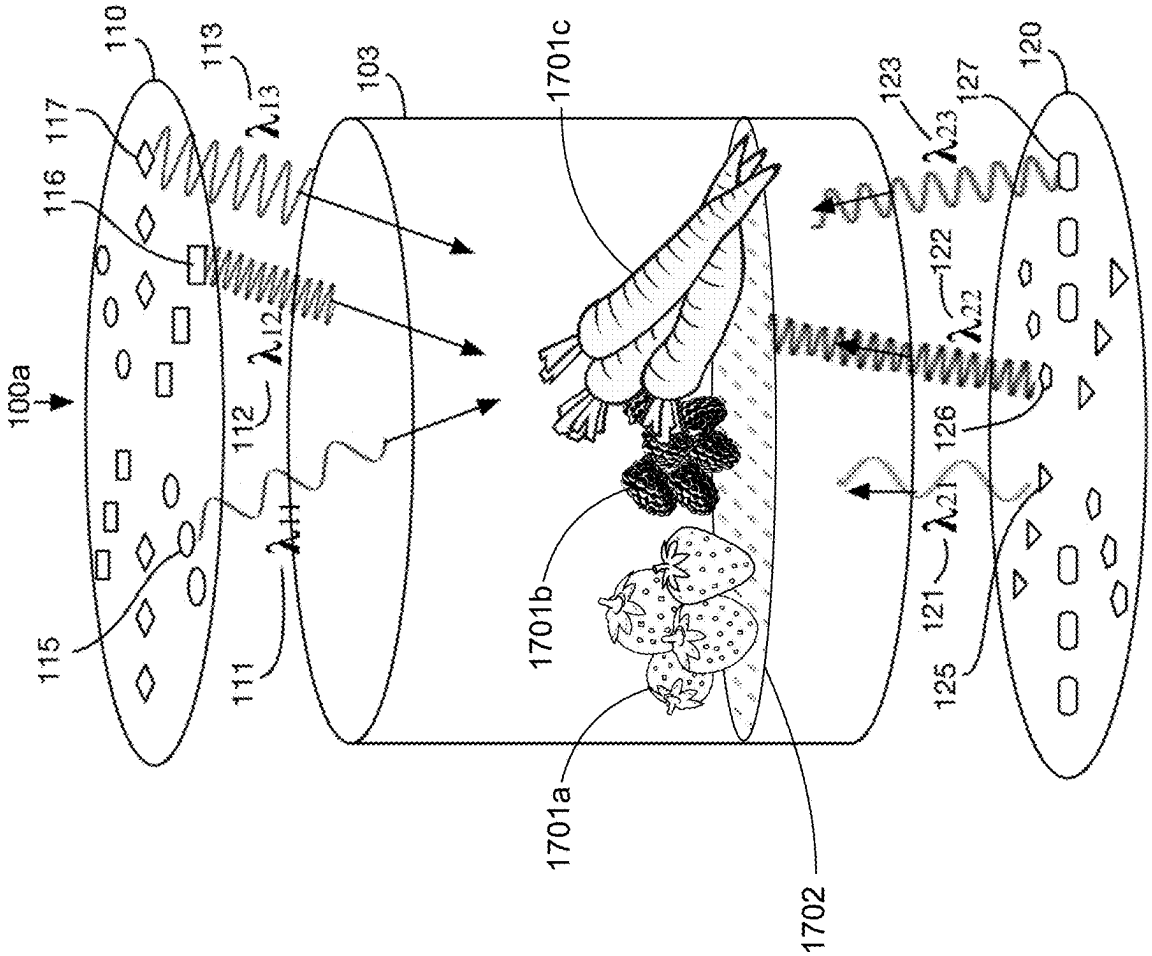
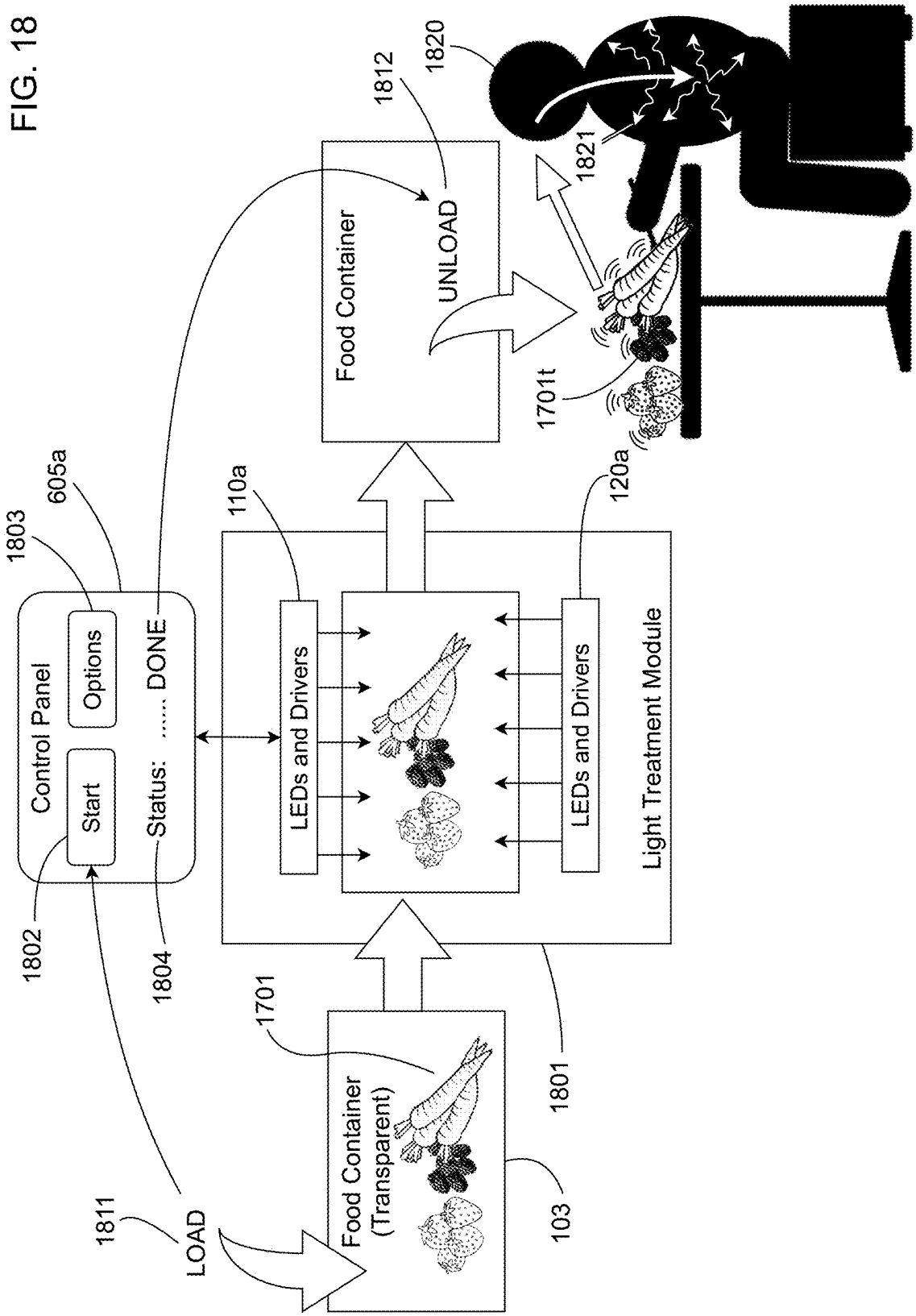

100a
110
113
λ_{13}
103
1701c
123
λ_{23}
127
120
117
116
λ_{12}
122
λ_{22}
112
λ_{11}
126
λ_{21}
121
115
111
1701b
125
1701a
1702

FIG. 18


1820
1812
1821
Food Container
UNLOAD
1701t
1803
605a
110a
120a
Control Panel
Options
Start
Status: ..... DONE
LEDs and Drivers
LEDs and Drivers
Light Treatment Module
1802
1804
1701
1801
1811
LOAD
Food Container
(Transparent)
103

DEVICE THAT TREATS FOOD WITH MULTIPLE WAVELENGTHS OFLIGHT

[0001] This application is a continuation in part of U.S. Utility patent application Ser. No. 18/918,326 filed 17 Oct. 2024, issued as U.S. Pat. No. 12,285,625 on 29 Apr. 2025, which is a continuation in part of U.S. Utility patent application Ser. No. 18/332,879 filed 12 Jun. 2023, the specifications of which are hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] One or more embodiments of the invention are related to the field of food treatment and enhancement systems. More particularly, but not by way of limitation, one or more embodiments of the invention enable a device that treats food with multiple wavelengths of light from one direction or different directions.

Description of the Related Art

[0003] Some existing devices treat food with light, typically for sterilization. However, there are no known systems that treat food with light alone to modify the energy content of the food. Moreover, existing food treatment devices typically use a single wavelength of light, which limits the potential effects of the treatment.

[0004] For at least the limitations described above there is a need for a device that treats food with multiple wavelengths of light.

BRIEF SUMMARY OF THE INVENTION

[0005] One or more embodiments described in the specification are related to a device that treats food with multiple wavelengths of light. Embodiments of the invention may treat food with multiple wavelengths of light selected from specific groups of wavelengths that are known to work well in combination.

[0006] One or more embodiments of the invention may have a transparent container that contains water to be treated, a first light panel located on a first side of the container, and a second light panel located on a second side of the container. Alternatively, the first light panel may be located underneath the transparent container, and the second light panel located on top of the transparent container. The first light panel may have multiple light sources that emit light of three different first side wavelengths that is directed towards the water in the container. The second light panel may have multiple light sources that emit light of three different second side wavelengths that is directed towards the water in the container. The three different second side wavelengths may all be different from the three different first side wavelengths. In one or more embodiments one or more light panels may be utilized that transmit a plurality of wavelengths. For example, embodiments may utilize one light panel to treat a subject from a single direction. These embodiments may be lighter, less costly and utilize less power.

[0007] In one or more embodiments of the invention, the second side of the container may be opposite the first side. In one or more embodiments the first light panel may be above the transparent container and the second light panel may be below the transparent container.

[0008] In one or more embodiments of the invention, the amounts of light emitted from the first light panel in each of the three different first side wavelengths may be substantially equal, and the amounts of light emitted from the second light panel in each of the three different second side wavelengths may be substantially equal. In addition, the amount of light from each LED that emits a wavelength for a given light panel may be different. More specifically, for the three wavelengths of light per panel as described in this invention, the amount of light per LED may be in the ratio of 0.875:1:1.125. In other words, the number of LED's, or the total power in watts of the first LED in the series as described in this invention will be 0.875 units relative to 1 unit for the second LED and 1.125 units for the third LED. In practice, what this means is that for an LED panel of 27 watts, LED **1** will be about 7.9 watts, LED **2** will be about 9 watts and LED **3** will be about 10.1 watts. Other LED powers may be utilized for slower or faster processing of water or for larger or smaller containers.

[0009] In one or more embodiments of the invention, the three different first side wavelengths may be selected from a first wavelength set that is selected from multiple wavelength set options, and the three different second side wavelengths may be selected from a second wavelength set, different from the first wavelength set, that is selected from these wavelength set options. Each wavelength set option may have three different wavelength one options, three different wavelength two options, and three different wavelength three options. The three different first side wavelengths may include a first wavelength that is substantially equal to one of the three different wavelength one options associated with the first wavelength set, a second wavelength that is substantially equal to one of the three different wavelength two options associated with the first wavelength set, and a third wavelength that is substantially equal to one of the three different wavelength three options associated with the first wavelength set. The three different second side wavelengths may include a first wavelength that is substantially equal to one of the three different wavelength one options associated with the second wavelength set, a second wavelength that is substantially equal to one of the three different wavelength two options associated with the second wavelength set, and a third wavelength that is substantially equal to one of the three different wavelength three options associated with the second wavelength set.

[0010] In one or more embodiments of the invention, the wavelength set options may include a first wavelength set option with wavelength one options that include 315 nm, 630 nm, and 1260 nm, with wavelength two options that include 276 nm, 511 nm, and 1102 nm, and with wavelength three options that include 349 nm, 698 nm, and 1396 nm. The wavelength set options may include a second wavelength set option with wavelength one options that include 281 nm, 561 nm, and 1122 nm, with wavelength two options that include 246 nm, 491 nm, and 982 nm, and with wavelength three options that include 310 nm, 619 nm, and 1238 nm. The wavelength set options may include a third wavelength set option with wavelength one options that include 266 nm, 532 nm, and 1064 nm, with wavelength two options that include 233 nm, 466 nm, and 932 nm, and with wavelength three options that include 294 nm, 587 nm, and 1174 nm. The wavelength set options may include a fourth wavelength set option with wavelength one options that include 237 nm, 473 nm, and 946 nm, with wavelength two

options that include 207 nm, 414 nm, and 828 nm, and with wavelength three options that include 261 nm, 522 nm, and 1044 nm. The wavelength set options may include a fifth wavelength set option with wavelength one options that include 211 nm, 421 nm, and 842 nm, with wavelength two options that include 185 nm, 369 nm, and 738 nm, and with wavelength three options that include 233 nm, 465 nm, and 930 nm. The wavelength set options may include a sixth wavelength set option with wavelength one options that include 374 nm, 748 nm, and 1496 nm, with wavelength two options that include 214 nm, 427 nm, and 855 nm, and with wavelength three options that include 339 nm, 677 nm, and 1354 nm. The wavelength set options may include a seventh wavelength set option with wavelength one options that include 280 nm, 560 nm, and 1120 nm, with wavelength two options that include 245 nm, 490 nm, and 980 nm, and with wavelength three options that include 309 nm, 618 nm, and 1239 nm. In tabular form:

TABLE 1

Wavelength Sets	
First wavelength set option	
wavelength one options that include	315 nm, 630 nm, and 1260 nm,
wavelength two options that include	276 nm, 511 nm, and 1102 nm, and
wavelength three options that include	349 nm, 698 nm, and 1396 nm.
Second wavelength set option	
wavelength one options that include	281 nm, 561 nm, and 1122 nm,
wavelength two options that include	246 nm, 491 nm, and 982 nm, and
wavelength three options that include	310 nm, 619 nm, and 1238 nm.
Third wavelength set option	
wavelength one options that include	266 nm, 532 nm, and 1064 nm,
wavelength two options that include	233 nm, 466 nm, and 932 nm, and
wavelength three options that include	294 nm, 587 nm, and 1174 nm.
Fourth wavelength set option	
wavelength one options that include	237 nm, 473 nm, and 946 nm,
wavelength two options that include	207 nm, 414 nm, and 828 nm, and
wavelength three options that include	261 nm, 522 nm, and 1044 nm.
Fifth wavelength set option	
wavelength one options that include	211 nm, 421 nm, and 842 nm,
wavelength two options that include	185 nm, 369 nm, and 738 nm, and
wavelength three options that include	233 nm, 465 nm, and 930 nm.
Sixth wavelength set option	
wavelength one options that include	374 nm, 748 nm, and 1496 nm,
wavelength two options that include	214 nm, 427 nm, and 855 nm, and
wavelength three options that include	339 nm, 677 nm, and 1354 nm.
Seventh wavelength set option	
wavelength one options that include	280 nm, 560 nm, and 1120 nm,
wavelength two options that include	245 nm, 490 nm, and 980 nm, and
wavelength three options that include	309 nm, 618 nm, and 1239 nm.

[0011] In other embodiments, the wavelength set may include two wavelength sets. The wavelength set options may include a first wavelength set option with wavelength one options that include 550 nm, 630 nm, and 710 nm. The second wavelength set options may include a first wavelength set option with wavelength one options that include 385 nm, 674 nm, and 866 nm. Water treated with these wavelength sets freezes in geometric shapes.

TABLE 2

Wavelength Sets	
First wavelength set	
wavelength one options that include	550 nm, 630 nm, and 710 nm.
Second wavelength set	
wavelength one options that include	385 nm, 674 nm, and 866 nm.

[0012] One or more embodiments of the invention may also have means for adding one or both of hydrogen and oxygen to the water before or during treatment. The Hydrogen may be added by using an electrolyzer, and then bubbling the Hydrogen into the water during the processing time of the water with the light panels. Alternatively, the Hydrogen may be added by using a material that contains Hydrogen. In one embodiment of the present invention the material that was selected is a Hydrogen contained within a silica cage, with this product having been invented by Patrick Flanagan and sold under the product name Crystal Energy®. Alternatively, the Hydrogen and Oxygen may be added from an electrolyzer, with both the Hydrogen and Oxygen being bubbled thru the water as the water is being processed by the light panels. Alternatively, the Hydrogen and Oxygen could be added with a material that contains Hydrogen and a material that contains Oxygen. Alternatively, the Hydrogen and Oxygen could be added by using a Browns Gas electrolyzer, and bubbled thru the water as the water is being treated by the light panel. Alternatively, the Hydrogen and Oxygen could be supplied from a PEM fuel cell. Alternatively, the Hydrogen and Oxygen could be supplied from tanks of stored gas.

[0013] One or more embodiments of the invention may enable a light therapy device that treats a subject with multiple wavelengths of light. The device may include multiple light sources configured to emit light of three different wavelengths that is directed towards a subject to be treated, such as a person or an animal. The three different wavelengths may be selected from a wavelength set that is selected from multiple wavelength set options. Each wavelength set option may have three different wavelength one options, three different wavelength two options, and three different wavelength three options. The three different wavelengths may include a first wavelength that is substantially equal to one of the three different wavelength one options associated with the wavelength set, a second wavelength that is substantially equal to one of the three different wavelength two options associated with the wavelength set, and a third wavelength that is substantially equal to one of the three different wavelength three options associated with the wavelength set.

[0014] In one or more embodiments of the light therapy device, the wavelength set options may include the options described above in Table 1.

[0015] In one or more embodiments of the light therapy device, the amounts of light emitted from the multiple light sources in each of the three different wavelengths may be substantially equal.

[0016] In one or more embodiments, the light therapy device may include a handheld therapy device.

[0017] In one or more embodiments, the light therapy device may be attached to or integrated into a hat, and the

light of three different wavelengths may be directed towards the scalp of the subject to be treated.

[0018] In one or more embodiments, the light therapy device may include a light therapy bed on or within which the subject to be treated is located during therapy.

[0019] In one or more embodiments, the light therapy device may include a facial treatment therapy device, and the light of three different wavelengths may be directed towards the face of the subject to be treated.

[0020] In one or more embodiments, the light therapy device may include a light therapy sauna within which the subject to be treated is located during therapy.

[0021] In one or more embodiments, the device may be configured to treat food. The food may be contained in a transparent container and one or more light panels may be located around the transparent container. Each light panel may contain multiple light sources that emit light of three different wavelengths, selected from the wavelength options described above in Table 1.

[0022] In one or more embodiments of a food treatment device, the amounts of light emitted from each light panel in each of the three wavelengths may be substantially equal.

[0023] In one or more embodiments of a food treatment device, the light panels may include a first light panel on a first side of the transparent container, and a second light panel on a second side of the transparent container. The second side may be opposite the first side; for example, the first light panel may be above the transparent container and the second light panel may be below the transparent container. The three wavelengths of light associated with the first light panel may all be different from the three wavelengths associated with the second light panel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The above and other aspects, features and advantages of the invention will be more apparent from the following more particular description thereof, presented in conjunction with the following drawings wherein:

[0025] FIG. **1** shows a schematic of an illustrative embodiment of the invention that treats water using light of three different wavelengths emitted from each of two light panels.

[0026] FIG. **2** shows illustrative options for wavelengths of light that may be used in one or more embodiments of the invention.

[0027] FIG. **3** shows an illustrative selection of 6 wavelengths from the options of FIG. **2** that may be used in one or more embodiments of the invention.

[0028] FIG. **4** shows images of results of an experiment that treated water using an embodiment of the invention; the crystal forms of the treated water when it was frozen demonstrate that the water had a novel structure.

[0029] FIG. **5** shows results of an experiment in which a test subject drank water treated using an embodiment of the invention.

[0030] FIG. **6** shows an illustrative water treatment device that treats water with light and then dispenses treated water on demand into a container for drinking, such as a cup or water bottle.

[0031] FIG. **7** shows an architectural diagram of selected components of the treatment and dispensing device of FIG. **6**.

[0032] FIG. **8** shows a more detailed architectural diagram of components of the treatment and dispensing device of FIG. **6**.

[0033] FIG. **9** shows a flowchart of treatment steps performed by the device of FIG. **6**.

[0034] FIG. **10** continues the flowchart of FIG. **9** to show dispensing of treated water followed by another cycle of water treatment to prepare for a next dispensing cycle.

[0035] FIG. **11** shows an illustrative light therapy device similar to a tanning bed that treats a person with multiple wavelengths of light that may be similar to those used in a water treatment device.

[0036] FIG. **12** shows an illustrative light therapy device integrated into a sauna.

[0037] FIG. **13** shows an illustrative light therapy device in a handheld unit.

[0038] FIG. **14** shows an illustrative light therapy device used as a facial treatment.

[0039] FIG. **15** shows an illustrative light device integrated into a hat to treat the scalp or hair.

[0040] FIG. **16** shows an illustrative light device used for agricultural treatment.

[0041] FIG. **17** shows a variation of the embodiment of FIG. **1** that is configured to treat food instead of or in addition to water.

[0042] FIG. **18** shows an architectural block diagram for an illustrative device that treats food with selected wavelengths of light.

DETAILED DESCRIPTION OF THE INVENTION

[0043] A device that treats food with multiple wavelengths of light will now be described. In the following exemplary description, numerous specific details are set forth in order to provide a more thorough understanding of embodiments of the invention. It will be apparent, however, to an artisan of ordinary skill that the present invention may be practiced without incorporating all aspects of the specific details described herein. In other instances, specific features, quantities, or measurements well known to those of ordinary skill in the art have not been described in detail so as not to obscure the invention. Readers should note that although examples of the invention are set forth herein, the claims, and the full scope of any equivalents, are what define the metes and bounds of the invention.

[0044] Experiments conducted by the inventor have explored the use of specific wavelengths of light to create oscillations in the water which could progressively add energy to the water. Results appear to be optimal when water is treated with **6** different wavelengths of light. This type of treatment results in a novel water structure which may have additional energy in the water. FIG. **4** below shows illustrative results of an experiment that demonstrates this novel structure.

[0045] FIG. **1** shows an illustrative device **100** that may be used to generate the desired structure of water. The device has a transparent container **103** that may hold water **104** to be treated. Container **103** may be of any shape and size. Two light panels **110** and **120** are located outside the container in different locations; for example, these panels may be on opposite sides of the container. In device **100**, light panel **110** is located above the container **103**, and light panel **120** is located below the container **103**. The light panels may each contain multiple light sources, such as LEDs or lasers for example. Each light source may emit a specific wavelength or range of wavelengths of light that is directed towards the water **104** in container **103**. The light emitted from the light

sources interacts with water **104** and modifies its structure, as described below. In one or more embodiments of the invention, each of the light panels **110** and **120** may emit three different wavelengths of light, and the wavelengths from one panel may all be different from the wavelengths from the other panel; thus, the water may be treated with **6** different wavelengths. The different wavelengths may be emitted from different types of light sources, or from light sources that are controlled to emit these different types of wavelengths. In FIG. **1**, the different light sources on panels **110** and **120** are indicated schematically by different shapes corresponding to different wavelengths; these icons do not necessarily indicate the actual shape of the light sources. Light panel **110** has 18 light sources, and light panel **120** has 18 light sources; these numbers are illustrative and embodiments may have any number of light sources on any light panel. Light source **115** emits light of wavelength **111**; light source **116** emits light of wavelength **112**; light source **117** emits light of wavelength **113**; light source **125** emits light of wavelength **121**; light source **126** emits light of wavelength **122**; and light source **127** emits light of wavelength **123**. The wavelengths **111**, **112**, **113**, **121**, **122**, and **123** may all be different. In one or more embodiments the amount of light emitted in each wavelength may be substantially equal for each of the different wavelengths. For example, in panel **110** there are 6 light sources associated with each of the wavelengths **111**, **112**, and **113**, and in panel **120** there are 6 light sources associated with each of the wavelengths **121**, **122**, and **123**; each of these light sources may have similar or equal power or intensity. In one or more embodiments the light panels do not substantially output other wavelengths of light beyond the three different wavelengths emitted. For example, the light emitted may have a peak with fall off around a central frequency so that other frequencies are not emitted with an amplitude near the amplitude of the central frequency.

[0046] One or more embodiments of the invention may also provide a mechanism to add either or both of hydrogen **105** and oxygen **106** to water **104** before or during treatment by the light from panels **110** and **120**. In one or more embodiments the hydrogen and oxygen may be generated by electrolysis of water, with the resulting hydrogen gas and oxygen gas bubbled through the water during treatment. An electrolyzer may be integrated into device **100**. The hydrogen and oxygen generated during electrolysis may be kept in the same vessel **104**. The hydrogen and oxygen may recombine into water when they are exposed to the light from the light panels. Instead of or in addition to electrolysis, any other source of hydrogen and/or oxygen gas may be used, and the gas may be bubbled through the water during treatment. Another source of hydrogen and/or oxygen that may be used in one or more embodiments is the introduction of compounds into the water that bear hydrogen and/or oxygen, such as hydrogen bound to a mineral or other complex.

[0047] An illustrative embodiment of device **100** may use for example a container **103** that is approximately 4 inches in diameter and 4 inches high and that holds approximately 500 ml of water, and panels **110** and **120** that are each be approximately 4 inches in diameter and may each consume approximately 20 watts of power. An illustrative treatment time for the water is 45 minutes. Additional sources of hydrogen and/or oxygen may or may not be used during treatment.

[0048] FIG. **2** shows illustrative wavelengths of light that may be used in one or more embodiments of device **100**. In one or more embodiments, for each light panel a selection **201** may be made to select one of the 7 wavelength set options of table **200**. Each light panel should be associated with a different wavelength set option. Then for each light panel, selection **202** may be made to choose one wavelength from each of the three columns of table **200**. These wavelength selection steps **201** and **202** ensure that all wavelengths are different, and the specific wavelengths in the rows and columns of table **200** have been found experimentally to provide the desired results. The actual wavelengths used in an embodiment may differ from the ideal wavelengths shown in table **200**, for example by approximately ±10 nm for each wavelength.

[0049] FIG. **3** shows an illustrative selection of wavelengths from table **200** for the light panels **110** and **120** and the wavelengths **111**, **112**, **113**, **121**, **122**, **123** of device **100** of FIG. **1**. In this example, light panel **110** is associated with wavelength option set **301**, and light panel **120** is associated with wavelength option set **302**. Any two wavelength option sets may be used. For panel **110**, the first wavelength **111** is the second wavelength of the first column; the second wavelength **112** is the second wavelength of the second column, and the third wavelength **113** is the second wavelength of the third column. For panel **120**, the first wavelength **121** is the first wavelength of the first column; the second wavelength **122** is the third wavelength of the second column, and the third wavelength **123** is the second wavelength of the third column. The illustrative selections are embodied in a device that treats water with **6** different wavelengths approximately equal to 630 nm, 551 nm, 698 nm, 374 nm, 855 nm, and 677 nm.

[0050] FIG. **4** shows results of an illustrative experiment performed by the inventor using an embodiment of the invention to treat water. In treatment step **401**, 500 ml of water was placed into a glass container, with the glass container being about 4" in diameter and about 4" in height. One of the LED panels as described above was placed below the glass container, and the other was placed on top of the glass container so that both LED panels simultaneously treated the water in the glass container. The water was treated for 45 minutes.

[0051] After treatment in step **401**, in step **402** the treated water was placed into a glass beaker which was then placed into a freezer. The water in the freezer was observed over the period of the next few hours as it froze. Image **410** shows the water at time **403** after 90 minutes, and image **420** shows the water at time **404** after 16 hours. What was noticed is that an implosion bubble **411** appears in image **410**, and the resulting frozen ice has a water vortex **421** frozen inside in image **420**. These unusual structures, which have not been previously observed in water, indicate that the structure of the water was altered by the treatment.

[0052] FIG. **5** shows the results of an experiment in which a test subject drank 500 ml of water that had been treated using an embodiment of the invention. Graphs **501** show a portion of a Biopulsar® recording of the subject, with the blue line **502** indicating the time at which the subject drank the treated water. The result was immediate (under 10 seconds) as well as systemic; the subject's readings became much more stable across multiple organ systems after drinking the treated water.

[0053] In one or more embodiments, the invention may be incorporated into a device that treats and dispenses water. The device may for example maintain a stock of treated water that can be dispensed on demand, and dispensing may trigger treatment of additional water to be ready for a subsequent dispensing cycle. FIG. **6** shows an illustrative treatment and dispensing device **600**. This device has a reservoir **601** that is filled by a user with untreated water. Lights and other components are contained within the housing **602**. When a user wants to obtain treated water, the user may place a container such as a cup or water bottle into dispensing area **603** and use the control panel **605** to initiate dispensing of treated water from output **604**. Control panel **605** may also include indicators of the device status, showing for example when components need to be replaced or refilled. Because treating water may take considerable time (such as 45 minutes, for example), the device may treat water in advance and hold treated water in one or more tanks to be ready for dispensing.

[0054] FIG. **7** shows a block diagram of selected illustrative components of device **600**. Tank **601** that a user fills with untreated water may be for example 2 L in capacity. (This is illustrative; the device and the capacity of its tanks and reservoirs may be of any size.) This illustrative device treats 500 mL of water per cycle. In the initial treatment step, 500 mL is pumped from the tank **601** through a filter to tank **701**, and minerals are added to the water from cartridge **702**. After infusing the water with the minerals, subsequent steps treat the mixture with light (as shown in FIG. **8**). Control panel **605** may provide indicators that the water filter or mineral cartridge **702** need to be replaced, and it may indicate that the tank **601** needs to be refilled. Panel **605** may also indicate when water is ready to be dispensed (after treatment), and how long a user may need to wait until the next dispensing cycle. When water is ready to be dispensed, the user may press button **703** to dispense 500 ml of treated water from output **604**.

[0055] FIG. **8** shows a more detailed block diagram of components of device **600**. The device has 4 tanks: reservoir **601** that holds untreated water, tank **701** where minerals are added to the water, and two light treatment tanks **801** and **802** with associated LED panels **811** and **812**, respectively. Water is pumped from reservoir **601** to tank **701** where minerals are added, and then into tanks **801** and **802** where the water/mineral mixture is treated with light. Treated water can be dispensed from either tank **801** or **802**. In one or more embodiments, LED panels **811** or **812** or both include at least one filter situated between the first light panel and the water that allows primarily only the wavelengths of the first wavelength set option or the second wavelength set option through while substantially blocking other wavelengths. In other embodiments, the filters may optionally be separate from the panels, i.e., not coupled to them but situated in proximity to them.

[0056] FIGS. **9** and **10** show flowcharts of illustrative steps performed by device **600** to treat and dispense water. FIG. **9** shows treatment steps that prepare water for initial dispensing. FIG. **10** shows an additional treatment cycle that occurs after dispensing, to prepare for the next dispensing cycle. In step **901**, the user fills the reservoir **601** with untreated water. In step **902**, a quantity of mineral (such as 0.5 mL) is injected into tank **701**, and in step **903**, 500 mL of water is added to tank **701**. (Quantities are illustrative.) In step **904***a*, the water/mineral mixture is pumped to light treatment tank **802**. Steps **902** and **903** are then repeated, and step **904***b* pumps the water/mineral mixture to light treatment tank **801**. Step **905** then applies light to both tanks **801** and **802**, for example for 45 minutes. If there is remaining water in reservoir **601**, steps **902***a* and **903***b* repeat filling of tank **701** and adding mineral, to prepare for the next light treatment cycle. Event **910** then indicates (for example on the display panel) that the device is ready to dispense treated water. The system may also maintain counters of the number of uses of the water filter and mineral cartridge and may modify these counters in steps **911** and **912** when water flows through the filter and when mineral is injected from the mineral cartridge; these counters enable the device to indicate when the filter or mineral cartridge needs to be replaced.

[0057] Continuing in FIG. **10**, when the user presses the button in step **1001** to dispense treated water, the device dispenses water in step **1002** from either tank **801** or **802** (depending on which was treated first). Steps **904***c*, **905***c*, **905***d*, **902***c*, **903***c*, **911***c*, and **912***c* then repeat mineral mixing and light treatment to refill the tank that was emptied in step **1002**. These steps enable the device to have treated water available on demand, as long as the user does not dispense more rapidly than the system can treat.

[0058] The inventor has discovered that the wavelengths used in a water treatment device may be beneficial in a light therapy device that treats a subject such as a person or an animal. Since human bodies are primarily water, directing the wavelengths described above at the skin of a person may have effects on the water in the body, or on other tissues. FIG. **11** shows an illustrative light therapy device **1101** that treats a subject **1102** using the multiple wavelengths described above. This illustrative embodiment resembles a tanning bed. One or more embodiments of the invention may incorporate lights that emit multiple wavelengths into any type of light therapy device that directs light at a subject. Illustrative examples of light therapy devices may include for example, without limitation, handheld light therapy devices, light therapy incorporated into a hat (for example for treating the scalp or as a treatment for hair loss), light therapy beds a subject is on or within for treatment, light therapy facial treatment devices (which direct light towards the face), and light therapy saunas a subject is within for treatment. Any device that directs light at a subject for therapy may incorporate any of the wavelengths described in this specification. A light therapy device enabled by the invention may direct light at any part or parts of a subject's body. Light may be shine directly onto the subject's skin, or light may affect the skin indirectly such as through clothing.

[0059] Light therapy device **1101** has multiple lights on the inner surface of the top lid of the device. The lights may be integrated into or attached to the device. Lights may be placed in any locations and may emit light in any directions. In this illustrative embodiment, light from the lights in the top lid is directed downward towards the skin of subject **1102** who lies on the lower part of the light therapy bed. The lights in device **1101** may be similar for example to those of panel **110** in water treatment device **100** of FIG. **1**. These lights may emit light of three or more wavelengths **111**, **112**, and **113**. These wavelengths may be selected for example from the wavelength set options described above in Table 1. Device **1101** may have any number of lights for each wavelength, of any size and power. In one or more embodiments the amounts of light emitted in each wavelength may

be substantially equal. Other embodiments may utilize one light source that outputs three different frequencies of light.

[0060] In one or more embodiments of the invention, the light therapy device may have additional light panels with other wavelengths. For example, light therapy device **1101** may have lights incorporated into a panel **120***a* located below the subject **1102**. Light therapy devices may have any number of light panels that emit light in any desired directions. Each may have any number of lights. In one or more embodiments a second light panel may emit light in wavelengths selected from the wavelength set options described above in Table 2; in one or more embodiments these wavelengths of a second light panel may differ from the wavelengths of other lights in the device. In other embodiments, the wavelengths from two or more lights may be the same.

[0061] Light therapy devices may have any size, shape, and form factor and may be used to treat any part or parts of a subject. They may be integrated into or attached to any other therapy devices or systems. FIG. **12**, FIG. **13**, FIG. **14**, FIG. **15** and FIG. **16** show other illustrative embodiments of a light therapy device that uses multiple wavelengths of light. FIG. **12** shows a light therapy device **1201** that is similar to a sauna, or that is integrated into a sauna. This device has lights that direct three wavelengths **111**, **112**, and **113** at a subject **1202** who may sit, stand, or lie in the sauna. FIG. **13** shows an illustrative handheld light therapy device **1301** that may be held by subject **1302** or by another person treating subject **1302**; device **1301** also emits three wavelengths **111**, **112**, and **113**. FIG. **14** shows an illustrative facial treatment light therapy device **1401** that directs light of wavelengths **111**, **112**, and **113** at the face of subject **1302**. FIG. **15** shows an illustrative light therapy device **1501** integrated into a hat, for example on the inside, that directs wavelengths **111**, **112**, and **113** at the scalp or hair of a subject **1502**, for example as a treatment for hair loss. FIG. **16** shows an illustrative plant treatment light therapy device **1601** that directs light of wavelengths **111**, **112**, and **113** at a plant **1602**.

[0062] In one or more embodiments, filters maybe coupled with or situated in front light therapy device **1101**, **1201**, **1301**, **1401**, **1501**, **1601** that allows primarily only the wavelengths of the first wavelength set option or the second wavelength set option through while substantially blocking other wavelengths. In other embodiments, the filters may optionally be separate from the panels, i.e., not coupled to them but situated in proximity to them, as previously described with respect to LED panels **811** and **812**.

[0063] The inventor has also discovered that the wavelengths of light used to treat water may also be beneficial in treatment of food. FIG. **17** shows a variation **100***a* of the device **100** of FIG. **1** (a water treatment device) configured to treat food instead of (or in addition to) water. The light panels **110** and **120** may be similar to or identical to those of a water treatment device, with LEDs that emit light of similar or identical wavelengths to those described above for a water treatment device. Transparent container **103** may be configured to contain or support any food item or items, such as illustrative strawberries **1701***a*, raspberries **1701***b*, and carrots **1701***c*. Any types of food, of any phase or consistency (including solids, liquids, pastes, or mixtures) may be placed into container **103** for treatment with light. Container **103** is preferably transparent to the wavelengths of light used in treatment. In one or more embodiments of the invention, container **103** may contain holes or gaps, and may only partially enclose or support the food items. In one or more embodiments the sides of the container **103** may be entirely omitted, and the food items may be simply placed on a transparent base **1702** that is placed between light panels **110** and **120**. As described with respect to FIG. **1**, the container, light panels, and LEDs may be of any size, shape, and orientation. Any number of light panels may be used, in any orientation relative to the food item or items. For example, in one or more embodiments, only a single light panel may be used (for example, panel **110** or **120** but not both), and this single panel may for example emit three different wavelengths of light.

[0064] Food may be treated with wavelengths of light such as those described with respect to FIG. **2**, and as illustrated for example in FIG. **3** with the six illustrative different wavelengths **111**, **112**, **113**, **121**, **122**, and **123**. Any wavelength or combination of wavelengths described above for water treatment may be used for food treatment as well.

[0065] The food treatment components shown in FIG. **17** may be incorporated into any type of food treatment device. Such a device may, for example, provide an area into which food can be loaded for treatment and unloaded after treatment; it may also provide a control panel similar to the control panel **605** of water treatment device **600** illustrated in FIG. **6**. FIG. **18** shows a block diagram of an illustrative food treatment device. A user first performs loading **1811** of one or more food items **1701** into container **103**. The food container **103** may be integrated into the device (as a zone within the device that receives food), or it may be loaded into the device. The food may be treated by light treatment module **1801** within the device that contains, for example, LEDs and LED drivers **110***a* and **120***a*. Treatment may begin for example when a user presses a start button **1802** or similar control on control panel **605***a* of the device. Panel **605***a* may also provide one or more options **1803** or similar controls, which may for example affect the intensity or duration of the light treatment of the food. A status area **1804** on control panel **605***a* may show the progress of treatment. When status **1804** indicates that treatment is done, the user may perform unloading **1812** of the treated food **1701***t*.

[0066] Treated food **1701***t* may contain energy that has been added to the food by the light treatment. When a person (or animal) **1820** consumes the treated food **1701***t*, energy **1821** may be radiated into the consumer's body, providing potentially beneficial effects. The specific wavelengths of light used for treatment may affect the types and levels of energy **1821** radiated into the consumer's body.

[0067] While the invention herein disclosed has been described by means of specific embodiments and applications thereof, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope of the invention set forth in the claims.

What is claimed is:

1. A device that treats food with multiple wavelengths of light, comprising:

a transparent container configured to contain food to be treated;

one or more light panels located around said transparent container, wherein:

each light panel of said one or more light panels comprises a plurality of light sources configured to

emit light of three different wavelengths that is directed towards said food in said transparent container;

said three different wavelengths are selected from a wavelength set selected from a plurality of wavelength set options comprising:

a first wavelength set option comprising

wavelength one options comprising 315 nm, 630 nm, and 1260 nm;

wavelength two options comprising 276 nm, 511 nm, and 1102 nm; and

wavelength three options comprising 349 nm, 698 nm, and 1396 nm;

a second wavelength set option comprising

said wavelength one options comprising 281 nm, 561 nm, and 1122 nm;

said wavelength two options comprising 246 nm, 491 nm, and 982 nm; and

said wavelength three options comprising 310 nm, 619 nm, and 1238 nm;

a third wavelength set option comprising

said wavelength one options comprising 266 nm, 532 nm, and 1064 nm;

said wavelength two options comprising 233 nm, 466 nm, and 932 nm; and

said wavelength three options comprising 294 nm, 587 nm, and 1174 nm;

a fourth wavelength set option comprising

said wavelength one options comprising 237 nm, 473 nm, and 946 nm;

said wavelength two options comprising 207 nm, 414 nm, and 828 nm; and

said wavelength three options comprising 261 nm, 522 nm, and 1044 nm;

a fifth wavelength set option comprising

said wavelength one options comprising 211 nm, 421 nm, and 842 nm;

said wavelength two options comprising 185 nm, 369 nm, and 738 nm; and

said wavelength three options comprising 233 nm, 465 nm, and 930 nm;

a sixth wavelength set option comprising

said wavelength one options comprising 374 nm, 748 nm, and 1496 nm;

said wavelength two options comprising 214 nm, 427 nm, and 855 nm; and

said wavelength three options comprising 339 nm, 677 nm, and 1354 nm; and,

a seventh wavelength set option comprising

said wavelength one options comprising 280 nm, 560 nm, and 1120 nm;

said wavelength two options comprising 245 nm, 490 nm, and 980 nm; and

said wavelength three options comprising 309 nm, 618 nm, and 1239 nm; and,

said three different wavelengths comprise

a first wavelength substantially equal to one of said wavelength one options associated with said wavelength set;

a second wavelength substantially equal to one of said wavelength two options associated with said wavelength set; and

a third wavelength substantially equal to one of said wavelength three options associated with said wavelength set.

2. The device that treats food with multiple wavelengths of light of claim **1**, wherein:

amounts of light emitted from each light panel in each of said three different wavelengths are substantially equal.

3. The device that treats food with multiple wavelengths of light of claim **1**, wherein:

said one or more light panels comprise

a first light panel located on a first side of said transparent container; and

a second light panel located on a second side of said transparent container.

4. The device that treats food with multiple wavelengths of light of claim **3**, wherein said second side of said transparent container is opposite said first side of said transparent container.

5. The device that treats food with multiple wavelengths of light of claim **4**, wherein

said first light panel is above said transparent container; and,

said second light panel is below said transparent container.

6. The device that treats food with multiple wavelengths of light of claim **3**, wherein

said three different wavelengths of light associated with said first light panel are all different from said three different wavelengths of light associated with said second light panel.

* * * * *