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McLeod

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(54) **RAIN CURTAIN HEADBOARD**

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A47C 31/00 (2006.01)

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,352,149	A *	9/1982	Stetler	B44F 9/00 239/18
D398,422	S *	9/1998	Rooks	D6/718.14
6,085,988	A *	7/2000	Marsh	B05B 1/3402 239/524
6,279,835	B1 *	8/2001	Hansen	B05B 17/085 40/406
7,861,942	B2 *	1/2011	Damon	B05B 17/085 239/18
8,225,539	B2 *	7/2012	Beebe	G09F 13/22 40/406
10,314,407	B1	6/2019	Main et al.	
2004/0112977	A1 *	6/2004	Fisher	B05B 17/085 239/17
2010/0005588	A1	1/2010	Christopher	
2018/0110960	A1	4/2018	Youngblood et al.	
2018/0160819	A1	6/2018	Rutledge	
2018/0214902	A1 *	8/2018	Focaccia	B05B 1/20
2019/0183254	A1	6/2019	Blackett	
2022/0212221	A1 *	7/2022	Cacoub	B05B 1/20
2023/0158414	A1 *	5/2023	Molenaar	B05B 17/08 472/128
2024/0138578	A1 *	5/2024	Washington	A47C 19/22

FOREIGN PATENT DOCUMENTS

KR	20160094711	A *	2/2015	A01G 31/02
KR	20180003077	A *	6/2016	A01G 7/045

* cited by examiner

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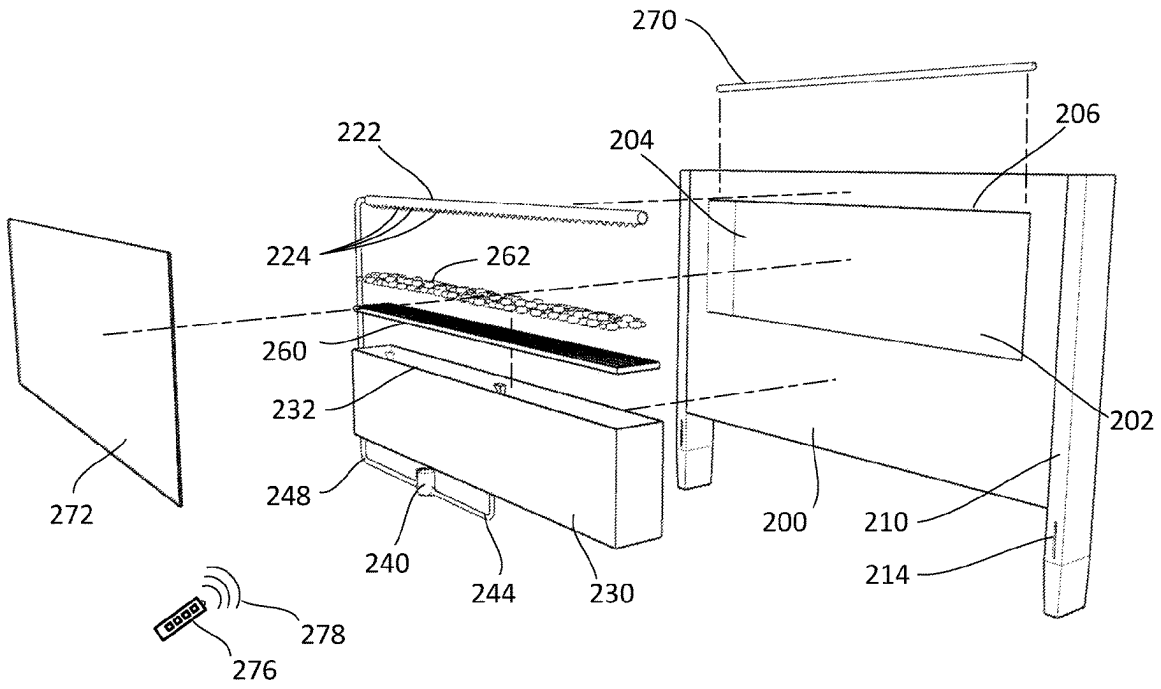
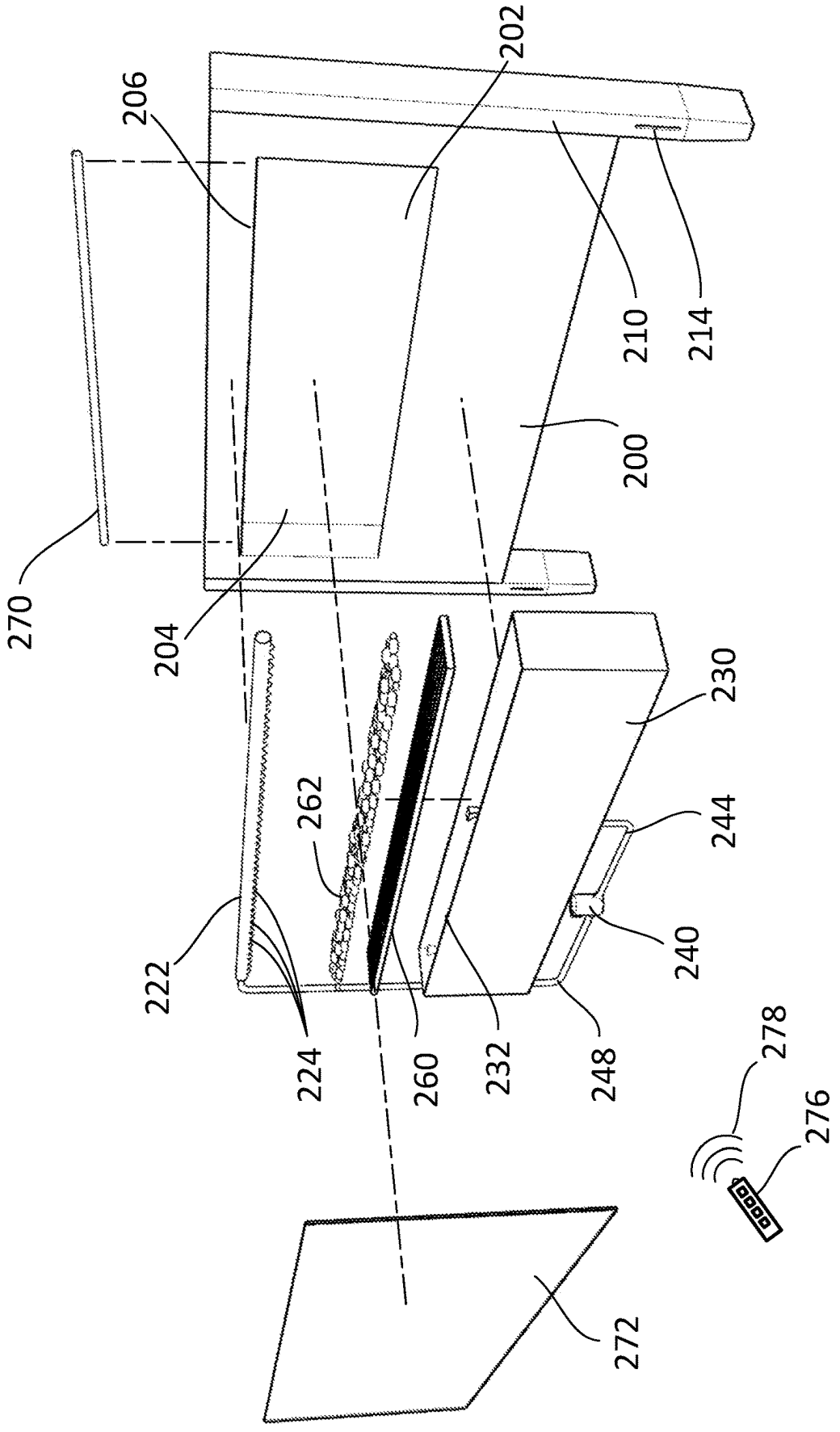
(57) **ABSTRACT**

The present invention is directed to a rain curtain headboard. The invention includes a headboard, a rain system, a light bar, and a viewing window. The headboard includes a cavity housing the rain system. The rain system creates a rain curtain, viewable through the viewing window, that is adapted to soothe a user using sound therapy, humidity, aromatherapy, or combinations thereof.

15 Claims, 4 Drawing Sheets




202
206
210
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204
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262
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222
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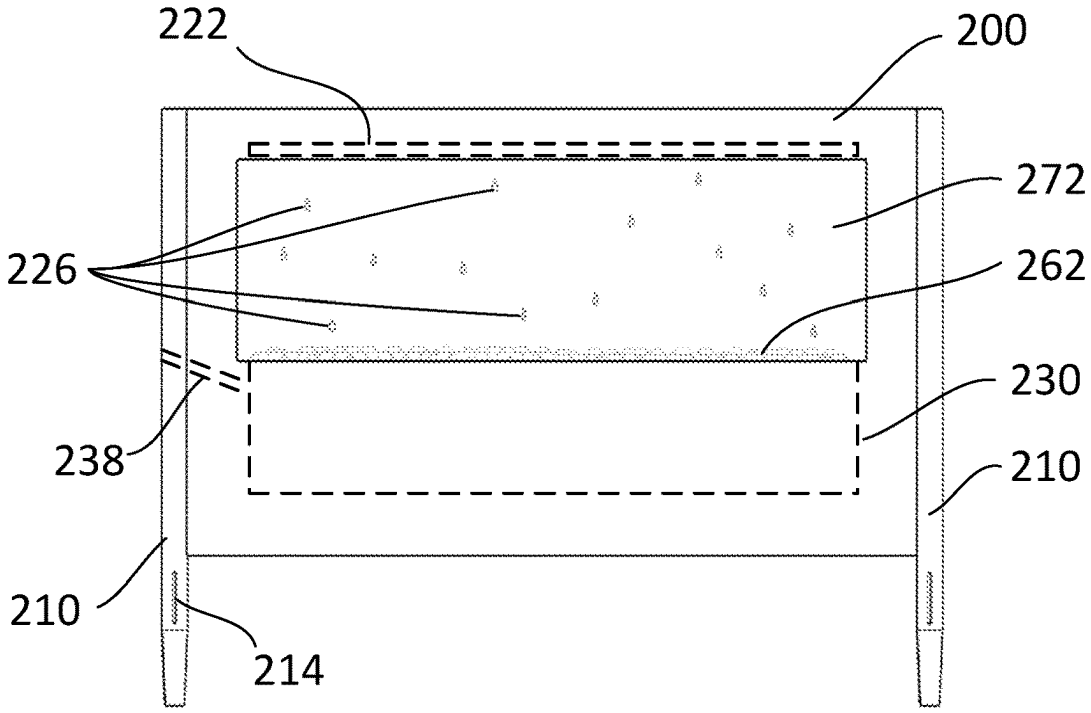
278
276
272

FIG. 1


222
200
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226
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230
238
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214

FIG. 2

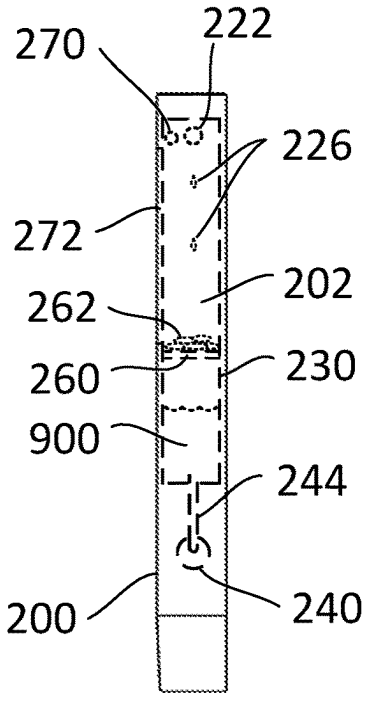

270
222
226
272
202
262
260
230
900
244
200
240

FIG. 3

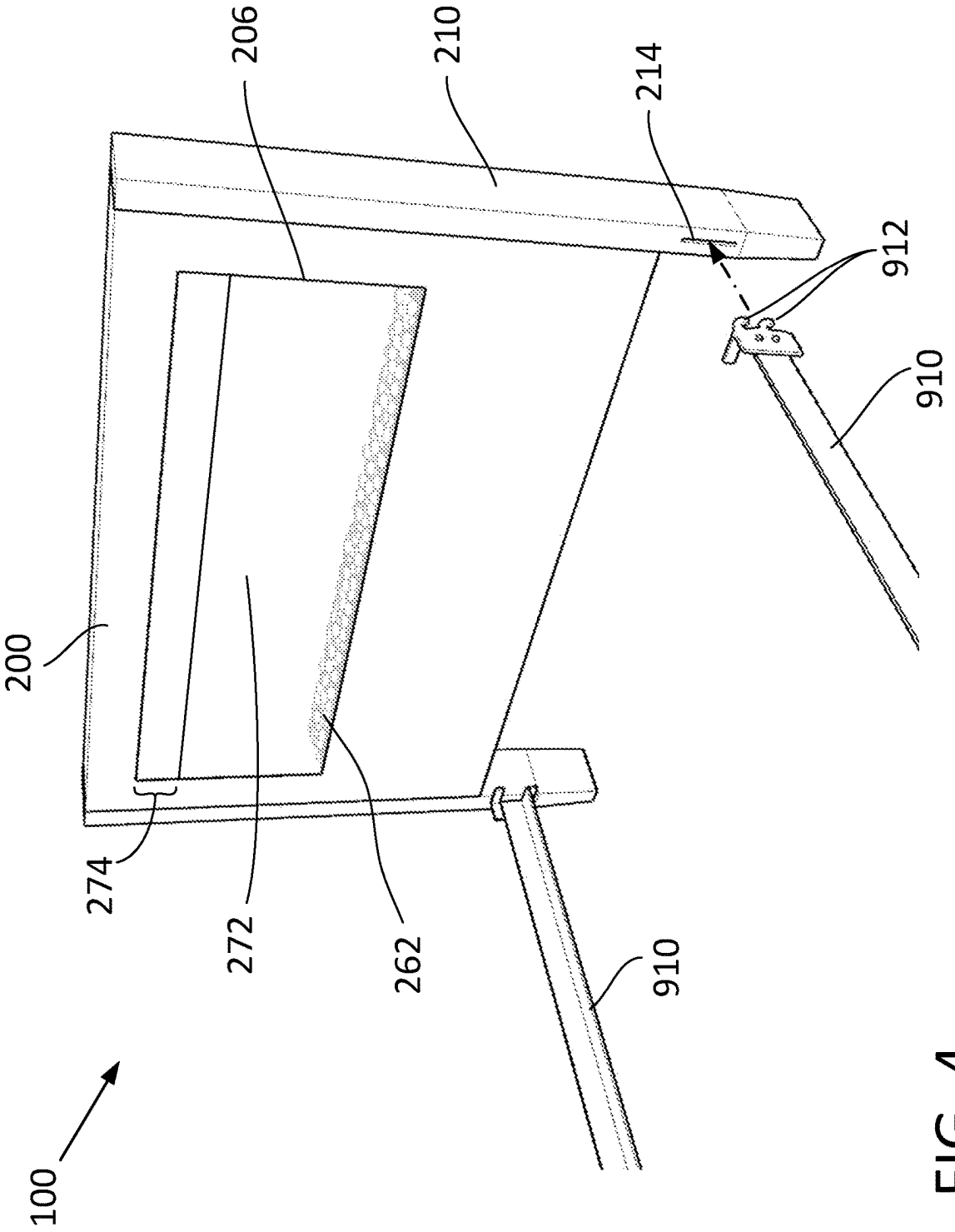
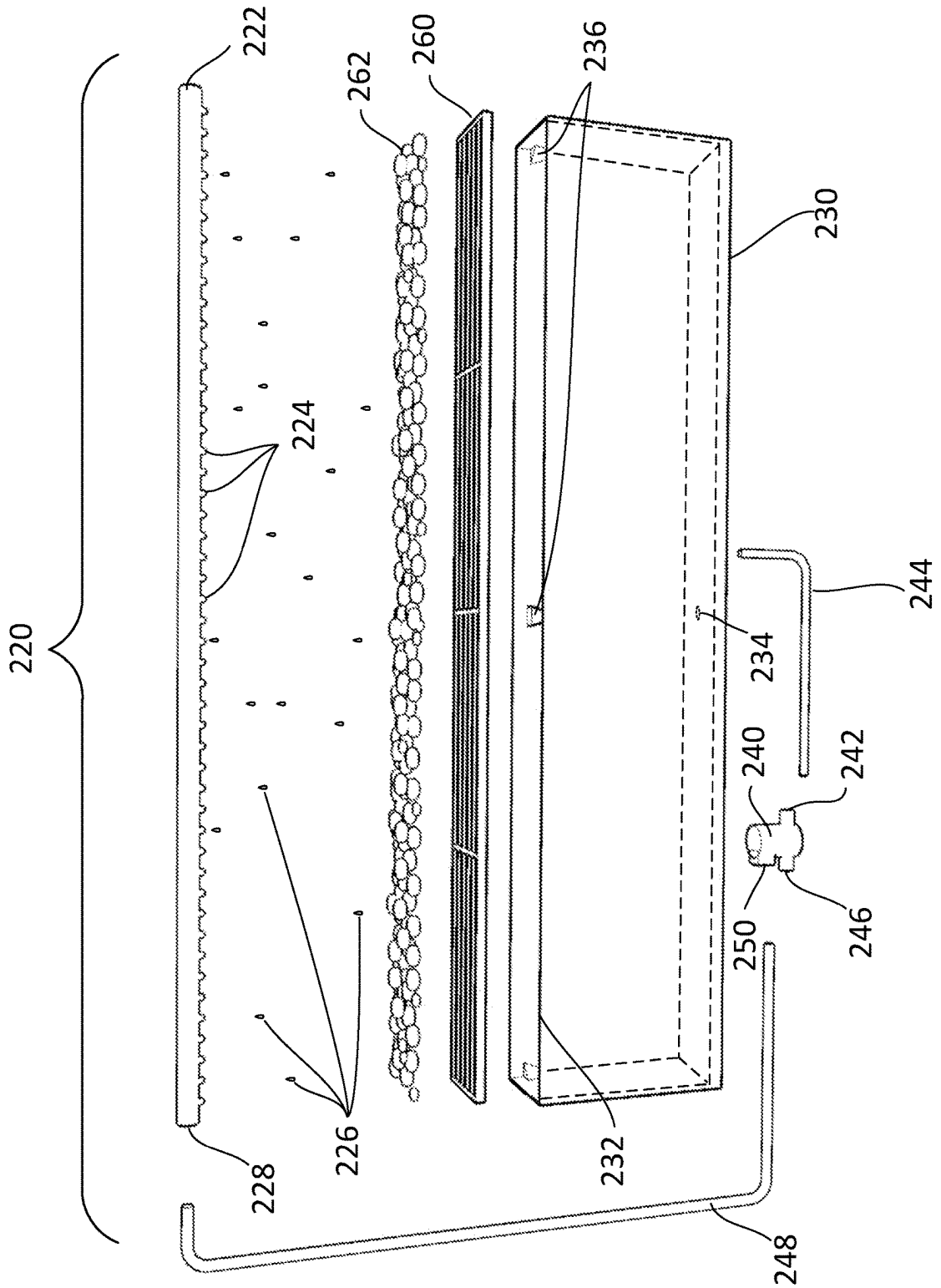


FIG. 4


220
222
224
226
228
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248
250
260
262

FIG. 5

RAIN CURTAIN HEADBOARD

FIELD OF THE INVENTION

This invention relates to sleep systems and accessories. More particularly, it relates to a rain curtain headboard for providing an improved sleep environment.

BACKGROUND

Sleep plays an essential role in a person's health and well-being throughout life. For example, sleep deficiency has been linked to a variety of serious chronic health problems, including increased risk of heart disease, high blood pressure, obesity, diabetes, kidney disease, and stroke. In addition to physical health, getting enough quality sleep is also important for one's emotional health. Insufficient or poor-quality sleep has been shown to negatively impact a person's happiness and quality of life and can also contribute to depression and other mood disorders. Sleep deprivation can also impair brain function and reaction time, which can lead to performance issues at work or school and can have more severe consequences such as causing car accidents. It is therefore important for a person to get enough quality sleep each night.

The sleeping area is central to a good night's rest. While poor-quality sleep can be linked to many different causes, there are several known environmental factors that can affect sleep quality. Important environmental factors may include, for example, noise levels, lighting, temperature, humidity, and ventilation. Depending on the person, too much or too little noise, light, temperature, air flow, and humidity may make it difficult to fall and remain asleep. While preferred sleeping environments can vary significantly from person to person, if one or more of the above environmental factors falls outside a person's preferred range, that person may suffer from poor sleep and the negative health consequences that come with it.

Accordingly, and in light of the foregoing, it would be desirable for a device that provides an enhanced sleeping environment with respect to the user's senses and relaxation levels.

DESCRIPTION OF THE DRAWINGS

The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the accompanying drawings, in which like elements are identified with like symbols, and in which:

FIG. **1** is an exploded view of a rain curtain headboard **100**, according to an embodiment of the present invention;

FIG. **2** is a front view of a rain curtain headboard **100**, according to an embodiment of the present invention; and,

FIG. **3** is a side view of a rain curtain headboard **100**, according to an embodiment of the present invention; and,

FIG. **4** is a detail view of a rain curtain headboard **100**, according to an embodiment of the present invention illustrating attachment of bed rails; and,

FIG. **5** is an exploded detail view of a rain curtain headboard **100**, according to an embodiment of the present invention illustrating the rain system.

DESCRIPTIVE KEY

100 rain curtain headboard
200 headboard

202 cavity
204 back wall
206 viewing aperture
210 leg
214 bed rail slot
220 rain system
222 rain effect discharge tube
224 nozzle
226 simulated raindrop
228 discharge tube inlet
230 water trough
232 top aperture
234 outlet tubing aperture
236 grate support
238 refill access
240 pump
242 pump intake
244 intake tubing
246 pump outlet
248 outlet tubing
250 controller
260 grate
262 splash target
270 light bar
272 viewing window
274 gap
276 remote control
278 wireless signal
900 water
910 bed rail
912 bed rail connecting hook

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a rain curtain headboard (herein described as the "invention") **100**. The present invention may also be used as a footboard. The invention **100** may comprise a headboard **200**, a rain system **220**, a light bar **270**, and a viewing window **272**. The headboard **200** may be a structural element of a bed frame. The headboard **200** may comprise a cavity **202** housing the rain system **220**. The rain system **220** may create a rain curtain, viewable through the viewing window **272**, that is adapted to soothe a user using sound therapy, humidity, aromatherapy, or combinations thereof. The light bar **270** may provide illumination for viewing items located within the cavity **202** including, but not limited to, the rain curtain.

The headboard **200** may be a vertically-oriented panel located at the head-end of a bed. The headboard **200** may be adapted to couple to bed rails **910** in order to support, in conjunction with other elements of the bed frame, a mattress. The headboard **200** may comprise the cavity **202** for housing the rain system **220**. The headboard **200** may comprise a viewing aperture **206**. The viewing aperture **206** may be an opening in the front of the headboard **200** that provides visual access to the rain system **220** located inside of the cavity **202**. The viewing window **272** may be watertight by covering the viewing aperture **206** to prevent water **900** from splashing out of the cavity **202**.

The headboard **200** may comprise a pair of legs **210** that elevate the headboard **200**. An individual leg selected from the pair of legs **210** may comprise a bed rail slot **214** located on the lower front of the individual leg. The bed rail slot **214** may provide an attachment point for bed rail connecting hooks **912**.

The headboard **200** may be made of wood, plastic, metal, or combinations thereof. In some embodiments, the headboard **200** may comprise padded material. In some embodiments, the headboard **200** may comprise one (1) or more bookshelves, reading lights, drawers, and/or other features commonly found on some headboards.

The rain system **220** may comprise a rain effect discharge tube **222**, a water trough **230**, a pump **240**, a controller **250**, and a grate **260**. The rain system **220** may create the rain curtain by pumping the water **900** from the water trough **230** to the rain effect discharge tube **222** and allowing the water **900** to fall from the rain effect discharge tube **222** back into the water trough **230** as simulated raindrops **226**. The simulated raindrops **226** may strike a plurality of splash targets **262** resting on the grate **260** at the top of the water trough **230**. The simulated raindrops **226** may create a sound as the simulated raindrops **226** strike the plurality of splash targets **262**. The sound may be adapted to be soothing.

The rain effect discharge tube **222** may comprise a plurality of nozzles **224** and a discharge tube inlet **228**. The rain effect discharge tube **222** may be a horizontally-oriented conduit that is located at the top center of the cavity **202**. As non-limiting example, the rain effect discharge tube **222** may be made from PVC, Stainless, Aluminum, or copper pipe. The water **900** may be pumped into the rain effect discharge tube **222** via the discharge tube inlet **228** and may flow out of the rain effect discharge tube **222** via the plurality of nozzles **224**.

The plurality of nozzles **224** may be a plurality of apertures that promote creation of the simulated raindrops **226**. The plurality of nozzles **224** may be linearly aligned and evenly spaced along the bottom of the rain effect discharge tube **222**. As non-limiting examples, the plurality of nozzles **224** may be as simple as holes drilled into the bottom of the rain effect discharge tube **222** or the plurality of nozzles **224** may comprise replaceable fixtures that screw into the bottom of the rain effect discharge tube **222**. In some embodiments, the plurality of nozzles **224** may be of uniform diameter such that the simulated raindrops **226** form at a uniform rate and/or size. In some embodiments, the diameter of the plurality of nozzles **224** may intentionally be varied such that the simulated raindrops **226** form at a non-uniform rate and/or size, thus imitating a random rainfall pattern. As the simulated raindrops **226** form at the plurality of nozzles **224**, the simulated raindrops **226** may fall from the rain effect discharge tube **222** towards the water trough **230**.

The water trough **230** may be a container for holding the water **900**. The top of the water trough **230** may be open to form a top aperture **232** where the water **900** may reenter the water trough **230** after falling as the simulated raindrops **226**. An outlet tubing aperture **234** located at the bottom of the water trough **230** may allow the water **900** to exit the water trough **230**. The outlet tubing aperture **234** may be located in the bottom wall of the water trough **230** if the pump **240** is located below the water trough **230**. In some embodiments, the pump **240** may be submersed in the water **900** in the water trough **230** and the outlet tubing aperture **234** may be located in a side wall of the water trough **230**.

In some embodiments, the headboard **200** may comprise a refill access **238** to provide access for refilling the water trough **230**. The refill access **238** may be operable to accept refill water and channel the refill water into the water trough **230**. The refill access **238** may be accessible on the left side of the headboard **200**, on the right side of the headboard **200**, on the front of the headboard **200**, on the rear of the headboard **200**, or combinations thereof. As a non-limiting example, the refill access **238** may be hidden behind a decorative emblem or door.

The water **900** may arrive at a pump intake **242** via an intake tubing **244** if the pump intake **242** is located below the water trough **230** or the water **900** may flow directly into the pump **240** if the pump **240** is a submersible pump located in the water trough **230**. The pump **240** may move the water **900** from the pump intake **242** to a pump outlet **246**. The pump **240** may be electromechanical and may comprise an internal motor that may be energized by the application of an electrical potential to the pump **240**. As non-limiting examples, the pump **240** may move the water **900** by applying rotary motion, reciprocating motion, linear motion, or a combination thereof to one or more gears, screws, pistons, shuttle blocks, vanes, diaphragms, plungers, chains, ropes, impellers, or combinations thereof. Because the pump **240** is applied with the bed, the pump **240** may be selected to meet specific acoustic noise requirements. An outlet tubing **248** may carry the water **900** from the pump outlet **246** to the rain effect discharge tube **222**. In some embodiments, the pump **240** may be submersible and may be placed in the water **900** at the bottom of the water trough **230**. In such embodiments, the outlet tubing **248** may pass through a wall or the bottom of the water trough **230** to reach the rain effect discharge tube **222**. The pump intake **242** may comprise the intake tubing **244**. The pump outlet **246** may comprise the outlet tubing **248**.

The controller **250** may determine when the electrical potential is to be applied to the pump **240**. The controller **250** may base decisions to energize the pump **240** on commands from wireless signals **278** received from a remote control **276**, on internal timers, or both. In some embodiments, the controller **250** may determine not only the on/off cycles of the pump **240** but also the volume of water moved by the pump **240**. As a non-limiting example, the controller **250** may control a voltage level of the electrical potential, a current level, a frequency of the electrical potential, a phase of the electrical potential, or combinations thereof to affect the volume of water pumped.

The grate **260** may be removably coupled to the top of the water trough **230**. The grate **260** may rest upon a plurality of grate supports **236** located within the water trough **230**. The plurality of splash targets **262** may be placed on the grate **260** such that the simulated raindrops **226** may strike the plurality of splash targets **262** as the simulated raindrops **226** fall.

The plurality of splash targets **262** may be selected for acoustic properties, appearance, or both. As non-limiting examples, the plurality of splash targets **262** may be stones, vase filler glass, landscape glass, bells, or metal plates. The plurality of splash targets **262** may be selected such that the plurality of splash targets **262** may make a distinct acoustic tone when struck by the simulated raindrop **226** or because they have a pleasing appearance.

The light bar **270** may illuminate the interior of the cavity **202**. The light bar **270** may be energized and controlled by the controller **250**. The controller **250** may determine the brightness and hue of the light bar **270**.

The viewing window **272** may be a transparent barrier between the rain curtain and the user to prevent the water **900** from splashing into the bed. As non-limiting examples, the viewing window **272** may be made from glass or clear acrylic plastic. In some embodiments, the viewing window **272** may comprise a gap **274** at the top of the viewing aperture **206** such that sound and moist air may pass from

within the cavity **202**. In some embodiments, the viewing window **272** may be translucent.

The remote control **276** may be adapted to permit the user to control any or all of these operational parameters of the invention **100**: pump on/off state, pump water volume, light bar on/off state, light bar brightness, light bar hue (color). The remote control **276** may be adapted to communicate user selections of the operational parameters to the controller **250** via the wireless signal **278**. In some embodiments, a smartphone may be used to control the controller **250** in place of or in addition to the remote control **276**. As a non-limiting example, the smartphone may communicate with the controller **250** via Bluetooth® protocols.

In some embodiments, the headboard **200** may comprise a decorative effect located on a back wall **204** of the cavity **202**. As non-limiting examples, the decorative effect may be an image such as soothing photograph or drawing or the decorative effect may comprise a texture such as a stone veneer.

In some embodiments, the invention **100** may comprise the use of water additives to prevent mildew, to add a scent to the water **900**, or both. As a non-limiting example, the water additives may comprise antifungal additives and/or antibacterial additives to prevent mildew and other biological contaminants. As a non-limiting example, the water additives may comprise scented oils to promote aromatherapy.

Although the headboard **200** has been described as coupling to the bed rails **910** using the bed rail connecting hooks **912**, it should be noted that the headboard **200** may be coupled to bolt-style bed rails by using an adapter between the bed rails **910** and the bed rail slots **214** on the headboard **200**. As a non-limiting example, the adapter may be a #711 Bolt-On to Hook-On Conversion Bed Frame Bracket.

In use, the bed rails **910** and the rest of the bed frames may be coupled to the headboard **200** and the mattress, bed sheets, comforters, and pillows may be placed on the bed frame. Water **900** may be added to the water trough **230**. The user may energize the pump **240** using the remote control **276** or the smartphone. The water **900** may be pumped into the rain effect discharge tube **222** and may fall from the plurality of nozzles **224** as the simulated raindrops **226**. The simulated raindrops **226** may create pleasing sounds as the simulated raindrops **226** fall onto the plurality of splash targets **262** creating a sound of falling rain as the simulated raindrops return to the trough. The user may control the speed of the pump **240** to increase or decrease the rate of production of the simulated raindrops **226**. The user may establish a desired lighting effect by using the remote control **276** or the smartphone to adjust the on/off state, intensity, and hue of the light bar **270**.

The steps involved in creating the sound of falling rain from a bed headboard includes fabricating a cavity in the headboard, mounting a rain discharge tube in the cavity, placing a plurality of splash targets under the rain discharge tube, covering the cavity with a transparent or translucent cover, circulating water from a trough through the rain discharge tube, and onto at least some of the splash targets, and illuminating the cavity with a light bar.

The exact specifications, materials used, and method of use of the invention **100** may vary upon manufacturing. The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated.

The invention claimed is:

1. A headboard for a bed consisting of:

a panel constructed to be located at a bed head-end; the panel comprising:

a cavity located in a portion of the panel visible from the bed;

a rain system mounted inside the cavity, wherein the rain system having:

a pump;

a water trough;

a rain effect discharge tube mounted in the cavity;

a plurality of splash targets mounted below the discharge tube; and

wherein, the pump is configured to pump water from the trough through the rain effect discharge tube to create simulated raindrops; and wherein, the simulated raindrops strike at least some of the plurality of splash targets creating a sound of falling rain as the simulated raindrops return to the trough; a controller, the controller configured to control the pump;

a light bar constructed to illuminate said cavity, the light bar configured to be controlled by the controller, the controller adapted to control either brightness or hue of the light bar; and

a transparent or translucent water-tight viewing window attached to the panel covering the cavity.

2. The headboard of claim **1**, wherein the rain system is constructed to create a rain curtain.

3. The headboard of claim **1**, wherein the rain effect discharge tube includes a plurality of nozzles.

4. The headboard of claim **3**, wherein the plurality of nozzles are holes drilled into the rain effect discharge tube.

5. The headboard of claim **1**, wherein the pump is mounted below the water trough.

6. The headboard of claim **1**, wherein the pump is submersed in the water trough.

7. The headboard of claim **1**, wherein the controller is configured to control on/off cycles of the pump.

8. The headboard of claim **1**, wherein the controller is configured to control volume of water moved by the pump from the trough to the rain effect discharge tube.

9. The headboard of claim **1**, wherein controller is configured to receive commands wirelessly from a remote-control unit or directly from an internal timer.

10. The headboard of claim **1**, wherein at least some of the splash targets are selected from the group consisting of stones, vase filler glass, landscape class, bells and metal plates.

11. A headboard for a bed of the type having legs and attachment points to a bed frame, the headboard consisting of:

a panel constructed to be located at a bed head-end; the panel including:

a cavity located in a portion of the panel visible from the bed;

a pump;

a water trough;

a rain effect discharge tube mounted in the cavity;

a plurality of splash targets mounted below the discharge tube;

a transparent water-tight viewing window attached to the panel covering the cavity to allow viewing of the cavity from the bed; a controller; wherein,

the pump is configured to pump water from the trough through the rain effect discharge tube to create simulated raindrops; and wherein, the simulated raindrops strike at least some of the plurality of splash targets creating a sound of falling rain as the simulated raindrops return to the trough and wherein a transparent water -tight viewing window attached to the panel covering the cavity.

12. The headboard of claim **11**, wherein the controller is configured to control the pump, and wherein, the controller is configured to control on/off cycles of the pump to control volume of water moved by the pump from the trough to the rain effect discharge tube.

13. The headboard of claim **12**, wherein controller is configured to receive commands wirelessly from a remote-control unit or directly from an internal timer.

14. The headboard of claim **11**, wherein at least some of the splash targets are selected from the group consisting of stones, vase filler glass, landscape class, bells and metal plates.

15. A method of creating a sound of falling rain from a bed headboard consisting of:

fabricating a cavity in the headboard, wherein a light bar illuminates said cavity;

mounting a rain discharge tube in the cavity;

placing a plurality of splash targets under the rain discharge tube;

covering the cavity with a transparent or translucent cover;

circulating water from a trough through the rain discharge tube, and onto at least some of the splash targets.

* * * * *