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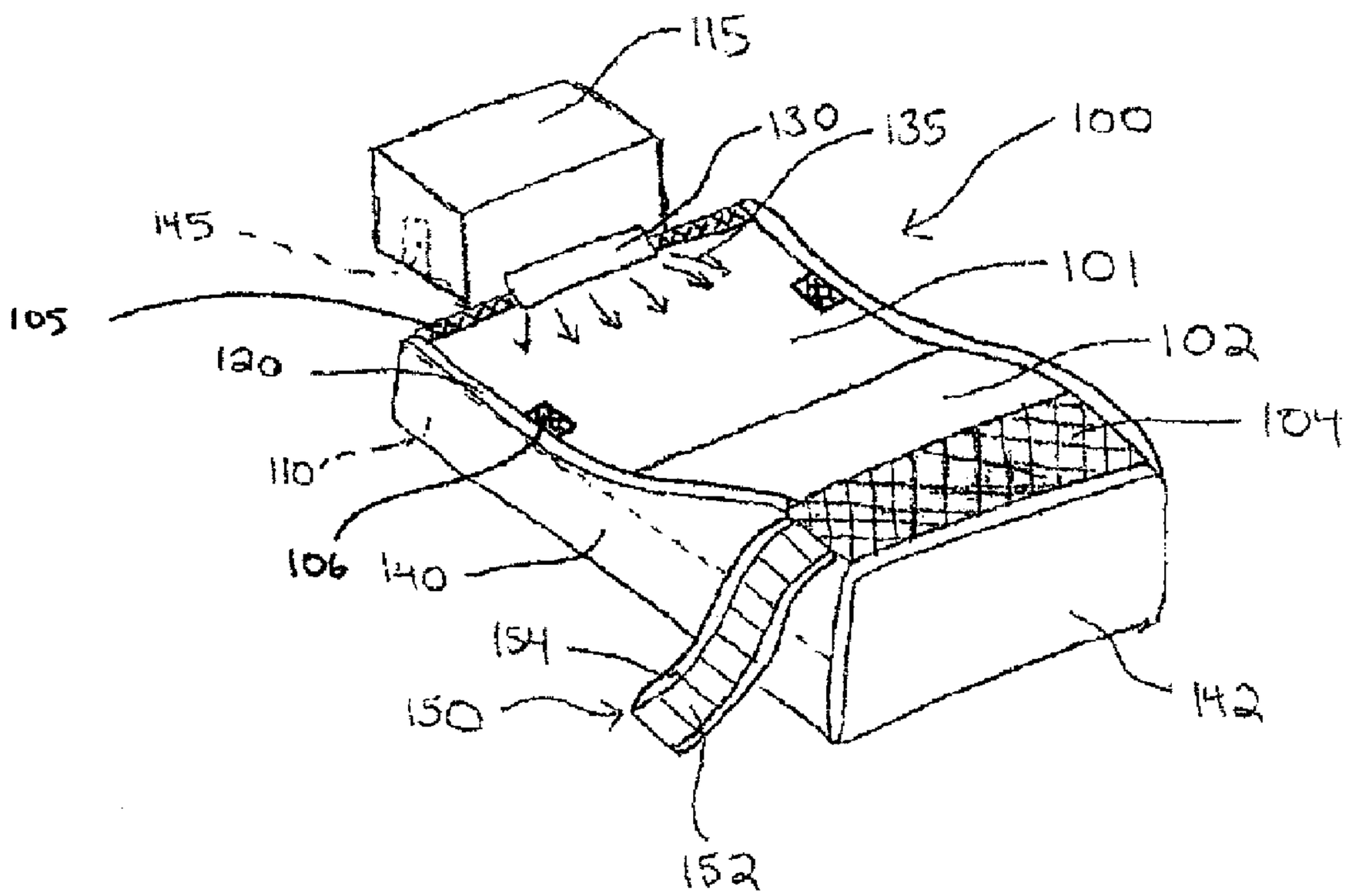
(54) **Title: INFLATABLE WATER ATTRACTION**



(57) **Abrégé/Abstract:**
A water or other amusement or surfing attraction that includes an inflatable portion or material. A variety of different waveforms, such as curling waves, may be generated. The inflatable portion or material may be inflated to different pressures, or multiple inflatable portions or materials may be coupled with the attraction such that the shape of a riding surface can be manipulated by modifying the amount of air or fluid used to inflate the inflatable portions or materials. Contouring elements that exhibit a force upon a sliding surface of an attraction may be used to form a desired contour in the sliding surface. Various riding configurations may be used as part of the attraction, including sidewalls that taper inward or flare outward, bowl-shaped riding surfaces, and half-bowl-shaped riding surfaces. Staircases that are inflatable or non-inflatable may be used as entry and/or exit points for riders to interact with the riding surfaces.

INFLATABLE WATER ATTRACTION

ABSTRACT

A water or other amusement or surfing attraction that includes an inflatable portion or material. A variety of different waveforms, such as curling waves, may be generated. The inflatable portion or material may be inflated to different pressures, or multiple inflatable portions or materials may be coupled with the attraction such that the shape of a riding surface can be manipulated by modifying the amount of air or fluid used to inflate the inflatable portions or materials. Contouring elements that exhibit a force upon a sliding surface of an attraction may be used to form a desired contour in the sliding surface. Various riding configurations may be used as part of the attraction, including sidewalls that taper inward or flare outward, bowl-shaped riding surfaces, and half-bowl-shaped riding surfaces. Staircases that are inflatable or non-inflatable may be used as entry and/or exit points for riders to interact with the riding surfaces.

INFLATABLE WATER ATTRACTION

BACKGROUND

1. Field

The present invention relates generally to water attractions, such as wave machines or surfing simulators. More particularly, the present invention relates to amusement or water attractions that incorporate one or more inflatable areas or portions.

2. Description of the Related Art

Water attractions (e.g., waterslides, surfing slides or machines, boogie-boarding slides, etc.) are a popular entertainment activity during periods of warm weather. Conventional water attractions are commonly made of fiberglass or other rigid or semi-rigid materials that provide a smooth and slippery surface for supporting a flow of water thereon to transport a rider from an entrance to an exit. A variety of different types of ride vehicles (e.g., inner tubes, body boards, surf boards, floatation devices, etc.) may be used by the rider when the rider travels along the water attraction by supporting the rider as the ride vehicle slides along the sliding surface.

Maintaining low friction between the rider (or a ride vehicle that the rider rides upon) and the sliding surface that supports the flow of water helps ensure an exciting or thrilling ride since the lower the friction on the sliding surface of the water attraction, typically the greater the speed that the rider may achieve. Lower friction between the rider and the sliding surface can also increase the comfort of the rider since it aids in preventing undesirable

rubbing on the rider's skin or tugging at the rider's swimsuit. When using a ride vehicle, low friction can also aid in lengthening the life of the ride vehicle and the water attraction due to reduced wear and tear to each of the ride vehicle and the water attraction as the ride vehicle travels down the water attraction, which can reduce maintenance or install costs.

One type of water attraction that has proven a popular lure for patrons to water or other amusement parks or venues is the surfing machine or simulator. These machines may be used both for entertainment purposes as well as training purposes for helping instruct individuals that may be wary or otherwise unable to surf out in the open ocean. Conventional surf machines utilize water pumps cooperating with nozzles or jets to flow a sheet or layer of water over a variety of surfaces and allow riders to skim atop the water flow. A sliding surface of the surf machines is conventionally a rigid or semi-rigid, low-friction surface that supports maneuvering by riders upon a conventional or modified surfboard or boogie board (individually and collectively referred to as a "board").

Unfortunately, users without much surfing experience, either in the ocean or upon surfing machines, commonly fall off of the board during early attempts at using surfing machines. The surfaces of these machines make uncomfortable contact with a rider upon the rider's falling off of their board. Moreover, the risk of falling while walking on conventional surf machines (e.g., when entering or exiting the portion of the ride to be surfed upon) is heightened since the surfing machine surface must commonly be manufactured to be slippery in order to adequately allow for low-friction between a rider's board and the surface of the ride.

As the sheet flow or standing wave product (collectively "surfing machine") market becomes more popular, water venues increasingly look to new surfing machines that can provide novel experiences to riders. Moreover, as the surfing industry becomes more sophisticated and the influence of extreme sports becomes more popular, more extreme standing waves created by such surfing machines is desired in order to satisfy the thrill anticipated by these

new generation of users, both adults and children. As new surfing machines are developed, particularly those with more extreme characteristics, safety concerns, manoeuvrability, and rider comfort must be adequately addressed.

Thus, an improved water attraction configured to allow for various kinds of waveforms, to help ensure rider safety, to reduce rider discomfort, and/or to improve rider maneuverability is desired. Ideally, the water attraction would allow a rider to make contact with the surface of the water attraction, for example, upon falling off of a ride vehicle, with reduced risk of injury or discomfort. Moreover, the water attraction would ideally permit improved control, either by the rider themselves, or by the ride designer, over the speed, location, orientation, or other maneuverability characteristic as the rider uses the water attraction.

SUMMARY

A water attraction or ride vehicle using inflatable materials is disclosed. In one embodiment, a water attraction may include a source of water for providing a flow of water, a sliding surface configured to support the flow of water thereon, a draining surface coupled with the sliding surface and configured to drain at least a portion of the flow of water therethrough, and an inflatable element disposed beneath the sliding surface, the inflatable element configured to inflate to produce a force upon the sliding surface.

In another embodiment, a water attraction may include a first inflatable bladder, a sheet disposed on at least a portion of the first inflatable bladder, wherein the sheet forms a first contour if the first inflatable bladder is inflated to a first pressure, and a source of water configured to provide a flow of water onto the sheet for a user to ride thereon.

In still another embodiment, a method of creating a wave of water for riding by a user, may include the steps of providing a sliding surface, the sliding surface configured to support the user thereon, providing an inflatable element positioned beneath the sliding surface, inflating the inflatable element to a first pressure, and flowing a flow of water onto the sliding surface, at least a

portion of the flow of water forming a first wave shape based upon a contour of the sliding surface due to the inflatable element being inflated to the first pressure.

BRIEF DESCRIPTION OF THE DRAWINGS

Other systems, methods, features, and advantages of the present invention will be or will become apparent to one with skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features, and advantages be included within this description, be within the scope of the present invention, and be protected by the accompanying claims. Component parts shown in the drawings are not necessarily to scale and may be exaggerated to better illustrate the important features of the present invention. In the drawings, like reference numerals designate like parts throughout the different views, wherein:

FIG. 1A shows a perspective view of an inflatable standing wave water attraction for a rider to surf thereon according to an embodiment of the present invention;

FIG. 1B shows a top view of a sliding surface of the inflatable standing wave water attraction with an inflatable bladder for modifying a shape of a wave formed from a flow of water according to an embodiment of the present invention;

FIG. 1C shows a top view of a sliding surface of the inflatable standing wave water attraction with a plurality of inflatable bladders for modifying a shape of a wave formed from a flow of water according to an embodiment of the present invention;

FIG. 2 shows a perspective view of an inflatable water attraction configured to generate a curling wave for a rider to surf thereon according to an embodiment of the present invention;

FIG. 3 shows a perspective view of an inflatable water attraction having curved and tapering sidewalls to generate a sliding surface for a rider to surf thereon according to an embodiment of the present invention;

FIG. 4 shows a perspective view of an inflatable water attraction having curved and flaring sidewalls to generate a sliding surface for a rider to surf thereon according to an embodiment of the present invention;

FIG. 5 shows a top view of an inflatable water attraction having a bowl-shaped sidewall to generate a sliding surface for a rider to surf thereon according to an embodiment of the present invention;

FIG. 6 shows a top view of an inflatable water attraction having a half-bowl-shaped sidewall to generate a sliding surface for a rider to surf thereon according to an embodiment of the present invention;

FIG. 7A shows a side view of an inflatable water attraction utilizing a connected plant room or equipment room and an integrated nozzle;

FIG. 7B shows a side view of an inflatable water attraction utilizing a submerged pump and an integrated nozzle;

FIG. 8A shows a side view of an inflatable water attraction with a variable ride surface and constant positioned dewatering area; and

FIG. 8B shows a side view of an inflatable water attraction with a variable ride surface and variable dewatering area.

DETAILED DESCRIPTION

The detailed description of exemplary embodiments herein makes reference to the accompanying drawings and pictures, which show the exemplary embodiments by way of illustration and its best mode. While these exemplary embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, it should be understood that other embodiments may be realized and that logical and mechanical changes may be made

without departing from the spirit and scope of the invention. Thus, the detailed description herein is presented for purposes of illustration only and not of limitation. For example, the steps recited in any of the method or process descriptions may be executed in any order and are not limited to the order presented. Moreover, any of the functions or steps may be outsourced to or performed by one or more third parties. Furthermore, any reference to singular includes plural embodiments, and any reference to more than one component may include a singular embodiment.

Turning first to FIG. 1 a perspective view of a water attraction **100** is shown that incorporates inflatable areas or materials. The water attraction **100** is formed of a structure that utilizes one or more inflatable elements (e.g., walls **140**, **142**). The inflatable elements may be walls, for example, as shown, that are configured to couple with one another and/or to other components of the water attraction **100** in order to form a stable base capable of supporting a flow of water upon certain surfaces of the water attraction **100**. A rider may therefore ride or surf upon such surfaces, as discussed in greater detail herein. A coating may be sprayed, painted, or otherwise applied to a surface of the inflatable elements or non-inflatable elements of the water attraction **100**, for example, to vary the smoothness or frictional coefficient of the underlying elements, as desired.

As illustrated, a source of water, such as one or more nozzles or jets **130** are connected at one end of the water attraction **100** and are configured to spray, flow, or otherwise provide a volume or flow **135** of water upon certain surfaces of the water attraction **100**. For example, a first surface **101** disposed immediately adjacent to the nozzles or jets **130** may be substantially planar in nature. A second surface **102** may be disposed at a tilted or inclined orientation (e.g., curved or planar) and coupled with the first surface **101**, with a lower elevation disposed closer to the nozzles or jets **130**. In one embodiment, the first surface **101** and the second surface **102** may be formed of the same material or same component. In an alternative embodiment, the

first surface **101** and the second surface **102** may be made of different materials or components.

A third surface **104** is connected with the second surface **102** and allows for water to be drained from the third surface **104** (e.g., via a grating, grille, mesh, etc. or other porous configuration or material making up the third surface **104**). Thus, the flow of water from the nozzles **130** flows onto the first surface **101**, then onto the second surface **102**, and finally onto the third surface **104** where the water is drained to a water reservoir **110** located, for example, underneath the first surface **101**, the second surface **102**, and/or the third surface **104**. One or more lower dewatering surfaces **105** and/or **106** may be positioned adjacent to the nozzles **130** and/or at lower elevation surfaces, for example, to drain water from the water attraction **100** when the water attraction is not powered or operating.

A plant room **115** for containing mechanical and/or electrical components that interface with the nozzles **130** is disposed adjacent to the nozzles **130**. For example, a pump **145** may communicate with water in the water reservoir **110** and may be configured to pump at least some of the water in the water reservoir **110** back to the nozzles **130** so that the water can be recirculated and flow again over the first, second, and third surfaces (**101**, **102**, **104**). The plant room **115** may be designed as a permanent structure, or may be a temporary structure (e.g., an inflatable and/or a mobile fiberglass structure) that is configured to be transported as part of a mobile water attraction. In some embodiments, the plant room **115** may feature an integrated or built in nozzle for the flowing of water onto the first, second, and/or third surfaces (**101, 102, 104**). Thus, in one embodiment, the water attraction **100** may be an inflatable standing wave ride that is connected to a separate fiberglass pump and/or plant room. In another embodiment, a pump may be located within a portion or area of the waterslide attraction **100**, for example, within the water reservoir, for the purposes of water recirculation.

A staircase **150** is positioned on one side of the water attraction **100** and extends from a ground level to the third surface **104** for allowing entry and/or

exit access for riders wishing to use the water attraction **100**. In an alternative embodiment, different locations along the water attraction **100** for a staircase may be used (e.g., alternative sides of the ride) and/or multiple staircases may be used (e.g., two staircases, one on each side of the ride). The staircase **150** includes steps **152** and side rails **154**. The side rails **154** may help ensure safety of riders using the steps **152** so that they do not fall off of the staircase **150** in the case of a loss of footing. Either or both of the steps **152** and/or side rails **154** may be inflatable. Similarly, perimeter protection bumpers **120** or other handrails, guardrails, footholds, handholds, etc. may be disposed along an outer edge of the water attraction **100** (or at other locations along its surfaces) for increased safety and/or containment of riders and/or water flowing on the water attraction **100**. In one embodiment, the perimeter protection bumpers **120** may be inflatable.

In one embodiment, one or more inflatable elements of the water attraction **100** may be inflated to differing pressures in order to raise/lower or otherwise adjust a shape of a wave formed by the flow of water upon its surfaces (e.g., the second surface **102**). For example, the second surface **102** may be a fabric, sheet or other material that is stretched (e.g., tensioned) or positioned over one or more inflatable elements (e.g., bladders) located beneath the second surface **102**. In another embodiment, the inflatable elements may be formed integrally as part of the second surface **102**. In such an embodiment, a rider may ride upon the inflatable or other contouring elements themselves (e.g., if the inflatable or other contouring elements are positioned on a top side of the sliding surface). Alternatively, an integrally formed inflatable or contouring element may be contained within an interior area of a fabric, sheet, or other material that is used for the second surface **102**.

As certain of those inflatable elements are inflated or the pressures of certain of those inflatable elements are adjusted, the shape of the second surface **102** may be modified as the inflatable elements act to raise or otherwise adjust the shape of the second surface **102**. When water flows over the second surface **102**, the shape of the second surface **102** may cause the

water to form different types of wave shapes (e.g., curling waves to the left or to the right, barreling waves to the left or to the right, etc.).

In another embodiment, one or more inflatable elements of the water attraction **100** may be inflated to differing pressures in order to maintain stability of the water attraction **100** while also providing safe and/or comfortable impact surfaces for riders (e.g., riders that fall off of their board or other ride vehicle). For example, impact or riding areas of the water attraction **100** may have the one or more inflatable elements in or associated with those areas inflated to a lower pressure while access and/or structural areas of the water attraction **100** may have the one or more inflatable elements in or associated with those areas inflated to a higher pressure. In another embodiment, one or more of the first surface **101**, the second surface **102**, and/or the third surface **104** may have an adjustable gradient for the riding slope. For example, such a configuration may be used to direct water flow in a particular direction from a higher slope elevation to a lower slope elevation.

FIG. 1B shows one exemplary method or manner of obtaining a desired waveform or shape on the water attraction **100** of FIG. 1A. An inflatable portion or bladder **160** is disposed on or otherwise coupled with (e.g., located beneath) the second surface **102** of the water attraction **100**. As increased amount of air or other fluid is provided to or in the bladder **160**, the bladder **160** inflates and presses against the second surface **102**, causing the second surface **102** to extend upward in a predetermined shape. For example, the concave portion **162** of the bladder **160** may form a curling wave when a flow of water flows **164** across the second surface **102**. Any of a variety of shapes may be formed via bladders coupled with the second surface **102** in an alternative embodiment. In one example, the bladder **160** may extend to the full width and/or length of the sliding surface **102** and/or the water attraction **100**. Certain embodiments may utilize additional inflatable elements configured to be positioned below and/or secured on top of the second surface **102** in order to generate a desired wave shape.

FIG. 1C shows another exemplary method of obtaining a desired waveform or shape on the water attraction **100**. A plurality of inflatable portions or bladders **170** are disposed on or otherwise coupled with (e.g., located beneath) the second surface **102** of the water attraction **100**. Similar to the discussion above, one or more of the inflatable portions or bladders **170** may be inflated so as to direct the flow of water that flows **164** across the second surface **102** in a desired or predetermined direction, thus creating waves having a certain shape or configuration. In addition or in the alternative, the bladders **170** may be manipulated so as to control the flow of water without changing a shape of a wave to be ridden by a rider (e.g., certain bladders **170** may be inflated in order to direct the flow of water to a drainage area).

FIG. 2 shows a perspective view of a water attraction **200** that generates a curling wave **210** that may be ridden or otherwise interacted with by a rider. The water attraction **200** may include features that are the same as or similar to those previously discussed. Thus, the water attraction **200** may utilize inflatable elements or portions and/or coatings for achieving a desired frictional coefficient such that a rider can ride upon a flow of water upon a sliding surface **202** and surf on or in a part of the curling wave **210**. Any of a variety of wave shapes or types may be generated in an alternative embodiment. In an alternative embodiment, multiple waves (e.g., curling waves) may be generated upon a sliding surface of a water attraction.

FIG. 3 shows a perspective view of a water attraction **300** with curved sidewalls that taper from a front end **360** to a rear end **370** of the water attraction **300**. The water attraction **300** may include features that are the same as or similar to those previously discussed. Thus, the water attraction **300** may utilize inflatable elements or portions and/or coatings for achieving a desired frictional coefficient such that a rider can ride upon a flow of water upon a sliding surface **310**.

A first curved sidewall **320** is disposed along a first edge of the sliding surface **310**. A second curved sidewall **322** is disposed along a second and opposite edge of the sliding surface **310**. A flow of water **340** is provided onto the

sliding surface **310** by one or more nozzles **350** or other jets. After flowing over the sliding surface, the flow of water may drain through a drainage surface or portion **330**, the same as or similar to the previous discussion. In certain embodiments, additional drainage surfaces or portions **332** and/or **334**, located at a top of each of the curved sidewalls **320** and/or **322** may be used. A rider may slide or surf upon the sliding surface **310** on the flow of water **340** and also slide or carve up all or a portion of the first curved sidewall **320** and/or the second curved sidewall **322**. Although the sidewalls (**320**, **322**) are shown in a tapered configuration from the front end **360** to the rear end **370** of the water attraction **300**, in an alternative embodiment, the sidewalls (**320**, **322**) may not taper and instead may be parallel or substantially parallel to one another or be oriented in a different configuration.

Similar to FIG. 3, a perspective view of a water attraction **400** is shown in FIG. 4. However, the water attraction **400** is shown with curved sidewalls that flare from a front end **460** to a rear end **470**. The water attraction **400** may include features that are the same as or similar to those previously discussed. Thus, the water attraction **400** may utilize inflatable elements or portions and/or coatings for achieving a desired frictional coefficient such that a rider can ride upon a flow of water upon a sliding surface **410**.

A first curved sidewall **420** is disposed along a first edge of the sliding surface **410**. A second curved sidewall **422** is disposed along a second and opposite edge of the sliding surface **410**. A flow of water **440** is provided onto the sliding surface **410** by one or more nozzles **450** or other jets. In certain embodiments, additional or alternative nozzles or jets may be placed in other locations of the water attraction **400**, for example, atop or beneath one or both of the curved sidewalls (**420**, **422**) and directed onto one of both of the curved sidewalls (**420**, **422**) in order to better wet the surfaces of the curved sidewalls (**420**, **422**). After flowing over the sliding surface **410**, the flow of water may drain through a drainage surface or portion **430**, the same as or similar to the previous discussion. Similar to previously discussed, in certain embodiments, additional drainage surfaces or portions **432** and/or **434**, located at a top of

each of the curved sidewalls **420** and/or **422** may be used. A rider may slide or surf upon the sliding surface **410** upon the flow of water **440** and also slide or carve up all or a portion of the first curved sidewall **420** and/or the second curved sidewall **422**. Although the sidewalls (**420**, **422**) are shown in a flared configuration from the front end **460** to the rear end **470** of the water attraction **400**, in an alternative embodiment, the sidewalls (**420**, **422**) may not flare and instead may be parallel or substantially parallel to one another or be oriented in a different configuration.

Turning next to FIG. 5, a water attraction **500** is shown from a top perspective. The water attraction **500** may include features that are the same as or similar to those previously discussed. For example, the water attraction **500** may include inflatable portions or elements that can be inflated to provide a riding surface or that can be inflated to provide a stable base or structure for coupling with a riding surface, such as a fabric sheet (e.g., flexible and/or with a low coefficient of friction), for enabling surfing or other riding by a rider.

The water attraction **500** is formed in the shape of a bowl. At a center area of the bowl is a plurality of nozzles **504** configured in a radial orientation such that they are capable of spraying or flowing **506** water in substantially 360 degrees. In an alternative embodiment, the plurality of nozzles **504** may be a single nozzle and/or may be capable of flowing water in less than 360 degrees. A sliding surface **502** in the shape of a bowl is positioned adjacent to the plurality of nozzles **504**. Thus, similar to previous embodiments, a rider may ride upon a flow of water from the plurality of nozzles **504** that flows over the sliding surface **502**, thus surfing or skimming on the water along an interior surface of the bowl shape. The bowl shape may allow for greater numbers of riders to concurrently use the water attraction**500**.

A drainage surface **510** is positioned adjacent to the sliding surface **502**. In an exemplary embodiment, the drainage surface is coupled with or otherwise meets with an upper edge of the sliding surface **502** such that the flow of water from the plurality of nozzles **504** travels onto the drainage surface **510** after flowing over the sliding surface **502**. Thus, the water flowed **506** from

the plurality of nozzles **504** flows first onto the sliding surface **502** in a direction towards the drainage surface **510**. When the water encounters the drainage surface **510**, the water is drained to a water reservoir, for example, a tank or volume of space positioned beneath the drainage surface. In one embodiment, the water reservoir may be disposed around at least part of a perimeter of the bowl shape formed by the sliding surface **502**. In an alternative embodiment, the water reservoir may be of any shape and located at any of a variety of positions, for example, interfacing with the water drained through the drainage surface **510** via a piping system to transport the water.

The same or similar methods or manners previously discussed, utilizing pumps, motors, and/or other mechanical and/or electrical equipment, may be used for pumping or otherwise recirculating the water in the water reservoir back to the plurality of nozzles **504** so that it can be reused and flowed again over the sliding surface **502**. Riders may enter upon the sliding surface **502** of the water attraction **500** via the drainage surface **510** or, in an alternative embodiment, another path, entrance, or exit means may be provided (e.g., a staircase may extend to a center of the bowl from outside the bowl, a portion of the bowl may be cut-away to allow riders to enter into the center of the bowl, etc.).

FIG. 6 shows a water attraction **600** in the form of a half-bowl from a top view. The water attraction **600** may include features that are the same as or similar to those previously discussed. For example, the water attraction **600** may include inflatable portions or elements that can be inflated to provide a riding surface or that can be inflated to provide a stable base or structure for coupling with a riding surface, such as a fabric sheet with a low coefficient of friction, for enabling surfing or other riding by a rider.

The water attraction **600** is formed in the shape of a half-bowl. At a lower area or position of the half-bowl is a plurality of nozzles **604** configured in a radial orientation such that they are capable of spraying or flowing **606** water in an outward direction onto the half-bowl shape (e.g., substantially 180 degrees). In an alternative embodiment, the plurality of nozzles **604** may be a

single nozzle and/or may be capable of flowing water in less than or greater than 180 degrees. A sliding surface **602** in the shape of a half-bowl is positioned adjacent to the plurality of nozzles **604**. Thus, similar to previous embodiments, a rider may ride upon a flow of water from the plurality of nozzles **604** that flows over the sliding surface **602**, thus surfing or skimming on the water along an interior surface of the half-bowl shape.

A drainage surface **610** is positioned adjacent to the sliding surface **602**. In an exemplary embodiment, the drainage surface is coupled with or otherwise meets with an upper edge of the sliding surface **602** such that the flow of water from the plurality of nozzles **604** travels onto the drainage surface **610** after flowing over the sliding surface **602**. Thus, the water flowed **606** from the plurality of nozzles **604** flows first onto the sliding surface **602** in a direction towards the drainage surface **610**. When the water encounters the drainage surface **610**, the water is drained to a water reservoir, for example, a tank or volume of space positioned beneath the drainage surface **610**. In one embodiment, the water reservoir may be disposed around at least part of a perimeter of the half-bowl shape formed by the sliding surface **602**. In an alternative embodiment, the water reservoir may be of any shape and located at any of a variety of positions, for example, interfacing with the water drained through the drainage surface **610** via a piping system to transport the water.

The same or similar methods or manners previously discussed, utilizing pumps, motors, and/or other mechanical and/or electrical equipment, may be used for pumping or otherwise recirculating the water in the water reservoir back to the plurality of nozzles **604** so that it can be reused and flowed again over the sliding surface **602**. Riders may enter upon the sliding surface **602** of the water attraction **600** via the drainage surface **610** or, in an alternative embodiment, other entrance means may be provided (e.g., riders may enter the sliding surface **602** from a side of the half-bowl shape without having to first step onto the drainage surface **610**).

FIG. 7A shows a side view of an inflatable water attraction **700** utilizing a connected plantroom or equipment room. The water attraction **700** may

include features that are the same as or similar to those previously discussed. The water attraction **700** has an inflatable base **702** upon which a sliding surface **706** is integral or attached thereto. A rider may surf or otherwise slide, either with or without a ride vehicle, upon a flow of water directed upon the sliding surface **706**. Similar to embodiments previously discussed, a drainage or dewatering area **708** is integral with the inflatable base **702** or is attached or formed thereon (e.g., via mesh, grating, grilles, etc.) and allows the flow of water to drain through the drainage or dewatering area **708** after the flow of water has travelled across the sliding surface **706** into a water reservoir **710**. As illustrated, the water reservoir **710** may be located beneath the sliding surface **706** and/or drainage or dewatering area **708** and contained by at least a part of the inflatable base **702**.

The inflatable base **702** includes a first set of a plurality of fixings **720** disposed along a surface of the inflatable base **702** (e.g., an underside) and are configured to attach or otherwise couple with a ground or floor surface to help maintain stability for the water attraction **700**. A separate plantroom **730** is located adjacent to the inflatable base **702** for the containment of various pieces of equipment used for proper operation of the water attraction **700** (e.g., filtration units, dosing units, controls, pumps, air blowers, nozzles, etc.). A second set of a plurality of fixings **722** are disposed on the plantroom **730** and/or on the inflatable base **702** for connecting the inflatable base **702** to the plantroom **730**. In one embodiment, securing the inflatable base **702** to the plantroom **730** (e.g., a heavier structure) may help keep the inflatable base **702** in a desired position, for example, during erection, during times when it is empty of water (such as during inspection or servicing), and/or when the inflatable base **702** is otherwise deflated of air or fluid.

The plantroom **730** includes a variety of pieces of equipment therein. For example, one or more pumps **750** is provided for pumping water from the water reservoir **710** to one or more nozzles **740**. A section inlet **780** may be provided within the water reservoir **710** and connected with the one or more pumps **750**. The suction inlet **780** may be positioned near the ground or floor

such that water is enabled to be pumped from the bottom of the water reservoir **710**. The one or more nozzles **740** is connected with the suction inlet **780** and/or the one or more pumps **750** via a filtration unit and/or dosing unit and/or manifold **770**. The one or more nozzles **740** are directly connected with the inflatable base **702** and are configured to spray water received from the water reservoir **710** back onto the sliding surface **706** of the water attraction **700**. In certain embodiments, the plantroom **730** may also include equipment for inflating one or more of the inflatable portions or surfaces of the water attraction **700** (e.g., air blowers).

FIG. 7B shows a side view of an inflatable water attraction **780**. The water attraction **780** has a base or structure **782** (e.g., inflatable) that forms or supports a sliding surface **781** for a rider to ride or surf thereon and a dewatering area **783** for draining water into a water reservoir **784** located beneath the sliding surface **781** and/or the dewatering area **783**. The water attraction **780** may include features that are the same as or similar to those previously discussed, for example, in FIG. 7A. However, the water attraction **780** utilizes a submerged pump **786**, located at least partially within the water reservoir **784** for pumping water from the water reservoir **784** to one or more nozzles **792**. The one or more nozzles **792** and associated piping or plumbing may be located within a nozzle area **790** (e.g., a connected plant room or equipment room). The nozzle area **790** may be a dry or wet area. The one or more nozzles **792** may be directly connected with the base or structure **782** and are configured to spray water received from the water reservoir **784** back onto the sliding surface **781** of the water attraction **780**.

FIG. 8A shows a side view of an inflatable water attraction **800** with a variable ride surface and constant positioned dewatering area. The water attraction **800** may include features that are the same as or similar to those previously discussed. The water attraction **800** has an inflatable base **802** that forms or supports a riding surface **804**. A flow of water **810** (e.g., from nozzles, jets, a sluice, gravity, etc.) flows over the riding surface **804** and is evacuated at a

dewatering area **806** by draining **820** into a water reservoir located beneath the riding surface **804** and/or the dewatering area **806**.

The riding surface **804** may be adjustable or variable, for example, to generate larger or smaller waves and/or a steeper surfing or riding portion. In one embodiment, the riding surface **804** may be varied via the use of inflatable bladders positioned underneath the riding surface **804**. Likewise, any other type of contouring element may be (inflatable or not) to vary the riding surface **804** (e.g., hydraulic elements, etc.). A first riding surface configuration **830** (e.g., a beginner configuration) may provide a rider with a low-elevation and easier surface to surf thereon. A second riding surface configuration **832** (e.g., a general use configuration) may provide a rider with a medium-elevation surface to surf thereon. A third riding surface configuration **834** (e.g., an expert configuration) may provide a rider with a steep-elevation surface to surf thereon. For each of the above-described configurations, the dewatering area **806** does not adjust in elevation. Different wave forms or shapes may be generated on any of the above-described configurations (e.g., the third riding surface configuration **834** may incorporate tube or barreling waves). In an alternative embodiment, greater or fewer variations to the riding surface **804** may be obtained.

FIG. 8B shows a side view of a portion of a riding surface **870** of an inflatable water attraction **850** with a variable ride surface and variable dewatering area. The same as or similar to the above description for FIG. 8A, the riding surface **870** may be configured to be in a first riding configuration **860** (e.g., a beginner configuration), a second riding configuration **862** (e.g., a general use configuration), and a third riding configuration **864** (e.g., an expert configuration). However, in FIG. 8B, a dewatering area **880** is configured to also adjust in elevation depending upon the configuration of the riding surface **870**. For example, the dewatering area **880** may be at a lowest elevation when the riding surface **870** is in the first riding configuration **860**, a middle elevation when the riding surface **870** is in the second riding configuration **862**, and a highest elevation when the riding surface **870** is in the third riding

configuration **864**. Similar to the above, different wave forms or shapes may be generated on any of the above-described configurations and/or greater or fewer variations to the riding surface **870** may be obtained in alternative embodiments.

Although the embodiments shown and described above feature water attractions having particular configurations or shapes, an inflatable portion and/or coating applied to the inflatable portion may be implemented on any of a variety of water or other attractions. In one example, entry and/or exit locations for a water ride may differ from those explicitly shown in the embodiments illustrated. In another example, a water attraction, such as a curling wave surfing ride, may have its entire main structure or sliding surface as an inflatable structure or made from an inflatable material. Alternatively, a water attraction, such as a curling wave surfing ride, may only be constructed with partially inflatable structures (e.g., at the entry and exit points and/or the sliding surface or riding area). In dewatering or drainage areas of a water attraction, such as at the exit points, an integral netting or grating may be used in place of, or in conjunction with, the inflatable materials at those locations.

The inflatable portion or portions may be adjusted to different pressures and/or different inflation amounts in order to achieve a variety of different wave forms or riding surface shapes or configurations. Moreover, alternative embodiments may have certain inflatable portions filled to greater pressures or amounts to aid in stability of the ride while other inflatable portions are filled to lower pressures or amounts to aid in providing a comfortable surface for riders to make contact with, for example, when such riders fall or lose their footing. Still other embodiments may utilize contouring elements or portions that exhibit a force on a sliding surface in similar fashion to the described inflatable embodiments, but may utilize hydraulic or other moving components, as previously discussed. Any of a variety of coatings may be applied to the surfaces of the inflatable portions, or other areas, of the water attractions (e.g., to increase or decrease friction coefficients of certain

surfaces with respect to others). One or more inflatable portions may be positioned at any desired location along the water attraction, for example, to provide a less rigid surface for more comfortably supporting riding thereon and/or to absorb an impact of the rider or a ride vehicle. In one example, the inflatable structure may be completely above ground, completely below ground, or partially above and partially below ground. In some embodiments, a water reservoir of the water attraction may be made of the inflatable material.

A water attraction using an inflatable portion or portions may be modular in nature such that it may be more easily manufactured, transportable, and/or constructed at a given location. For example, a water attraction using an inflatable portion or portions may be designed to be portable such that it is intended to be used at a given geographic location for a short period and then deflated and/or deconstructed and shipped to a new location. A lifting pallet (e.g., configured to interface with a forklift or other equipment designed to couple therewith for transportation) may be integral, built in, or otherwise attached with a surface of a water attraction (e.g., on an underside, to the draining surface, sliding surface, or any other component) in order to more easily move the water attraction between geographic locations. Certain embodiments may utilize different colors, textures, patterns, etc. upon different areas or surfaces of the water attraction, for example, to help riders distinguish between queuing / non-riding areas and the riding areas of the attraction. Certain embodiments, including any of those previously discussed, may utilize a sheet flow of water or a deep flow of water to generate a standing wave ride.

The previous description of the disclosed examples is provided to enable any person of ordinary skill in the art to make or use the disclosed methods and apparatus. Accordingly, the terminology employed throughout should be read in a non-limiting manner. Various modifications to these examples will be readily apparent to those skilled in the art, and the principles defined herein may be applied to other examples without departing from the spirit or scope of

the disclosed method and apparatus. The described embodiments are to be considered in all respects only as illustrative and not restrictive and the scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope. Skilled artisans may implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the disclosed apparatus and methods. The steps of the method or algorithm may also be performed in an alternate order from those provided in the examples.

CLAIMS

1. A water attraction comprising:

a source of water for providing a flow of water positioned at a first end of the water attraction;

a support structure comprising a first inflatable wall coupled to a second inflatable wall, the first inflatable wall extending from the first end to a second end of the water attraction opposite to the first end, and the second inflatable wall being positioned at the second end of the water attraction and extending substantially perpendicular to the first inflatable wall;

a sliding surface extending from the first end towards the second end of the water attraction and being supported by the first and second inflatable walls, the sliding surface configured to direct the flow of water thereon;

a draining surface extending from the second end towards the first end, the draining surface coupled with the sliding surface and the second inflatable wall, and extending at least a partial length of the second inflatable wall, wherein the draining surface is configured to drain at least a portion of the flow of water therethrough; and

a contouring element that is different from the sliding surface and disposed adjacent to the sliding surface, the contouring element configured to be modified to produce a force upon the sliding surface for changing a shape of the sliding surface by stretching a portion of the sliding surface.

2. The water attraction of claim 1, wherein the contouring element is inflatable, the contouring element configured to inflate to produce a force upon the sliding surface.

3. The water attraction of claim 2, wherein the force upon the sliding surface is configured to create a wave of water in at least a portion of the flow of water.

4. The water attraction of claim 3, wherein the contouring element is configured to be inflated to a first pressure or to a second pressure, the wave of water being different when the contouring element is inflated to the first pressure compared to the second pressure.

5. The water attraction of claim 1, further comprising a staircase coupled with the draining surface, at least a part of the staircase being made of an inflatable material.

6. The water attraction of claim 1, further comprising:

a first sidewall coupled with a first side of the sliding surface; and

a second sidewall coupled with a second side, opposite the first side, of the sliding surface,

wherein the first sidewall and the second sidewall form a tapered area therebetween such that the sliding surface is wider at a first end than at a second end.

7. The water attraction of claim 1, wherein the sliding surface forms the shape of a half-bowl.

8. The water attraction of claim 1, further comprising a coating applied to the sliding surface for achieving a desired frictional coefficient for the sliding surface.

9. The water attraction of claim 1, further comprising a lifting pallet coupled with the draining surface, the lifting pallet configured to interface with a fork-lift for portability between geographic locations.

10. The water attraction of claim 1, wherein the source of water is a water nozzle or a water jet.

11. The water attraction of claim 1, wherein the sliding surface comprises a tensioned sheet.

12. The water attraction of claim 1, wherein the first and second inflatable walls are substantially perpendicular to the sliding surface.

13. The water attraction of claim 1, wherein the contouring element comprises a plurality of inflatable portions or bladders, wherein one or more of the inflatable portions or bladders are configured to be individually inflated to control the flow of water.

14. The water attraction of claim 13, wherein the inflatable portions or bladders are configured to be individually inflated to control the flow of water without changing the shape of a wave to be ridden by a rider.

15. The water attraction of claim 13, wherein the inflatable portions or bladders are configured to be individually inflated to direct a flow of water to a drainage area.

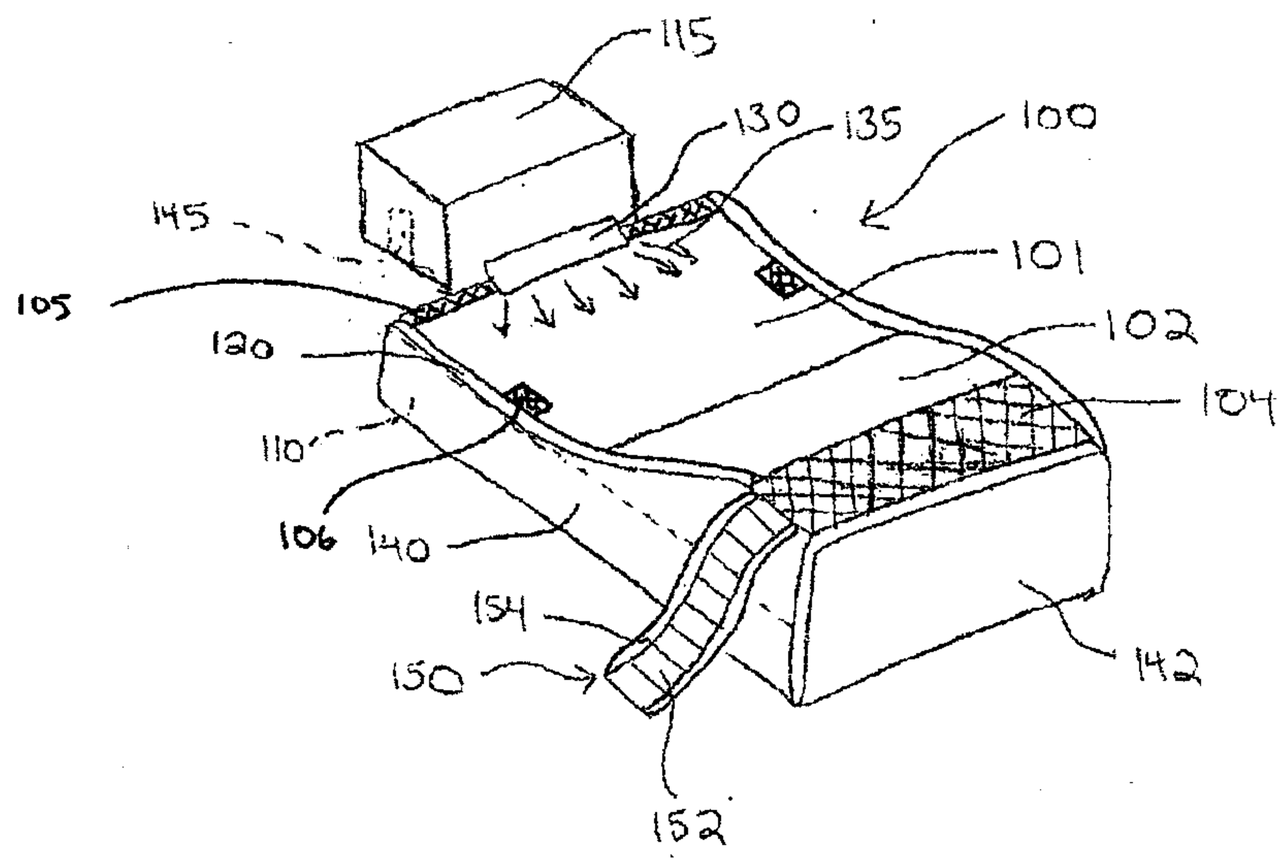

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FIG. 1A

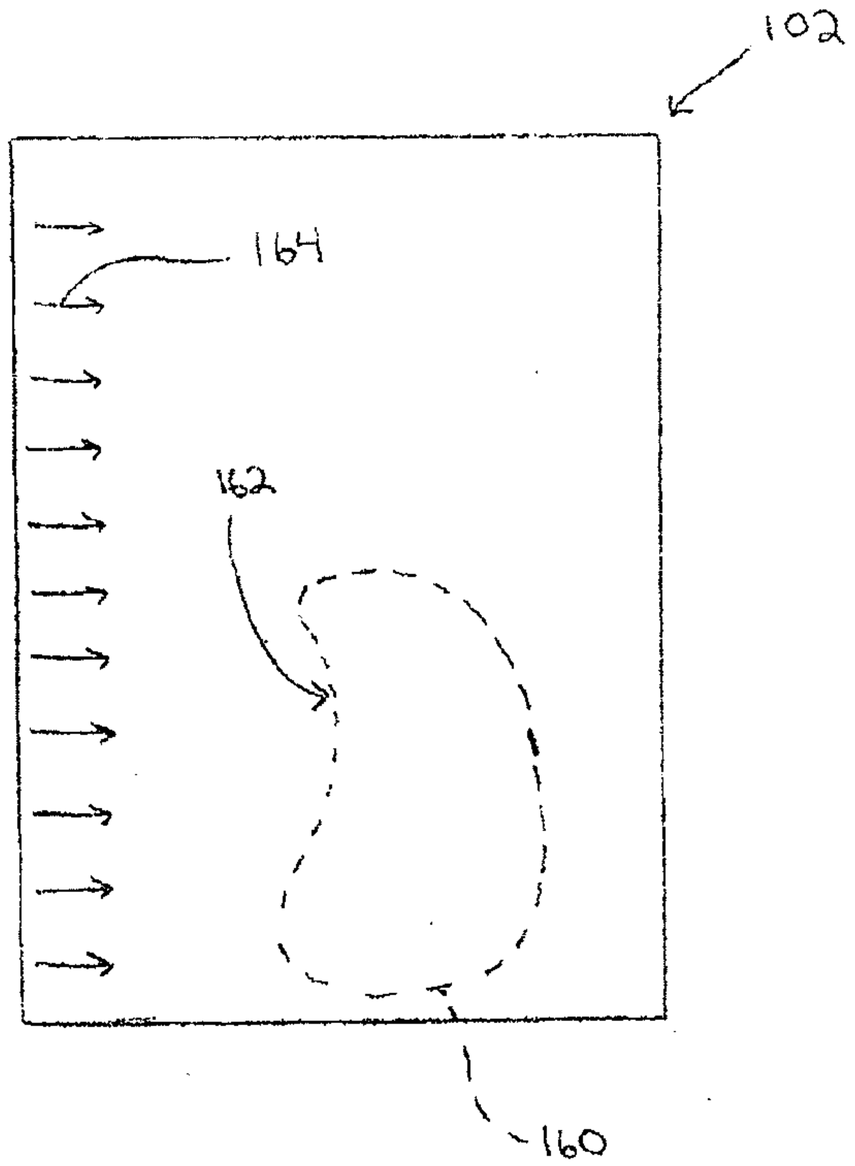


FIG. 1B

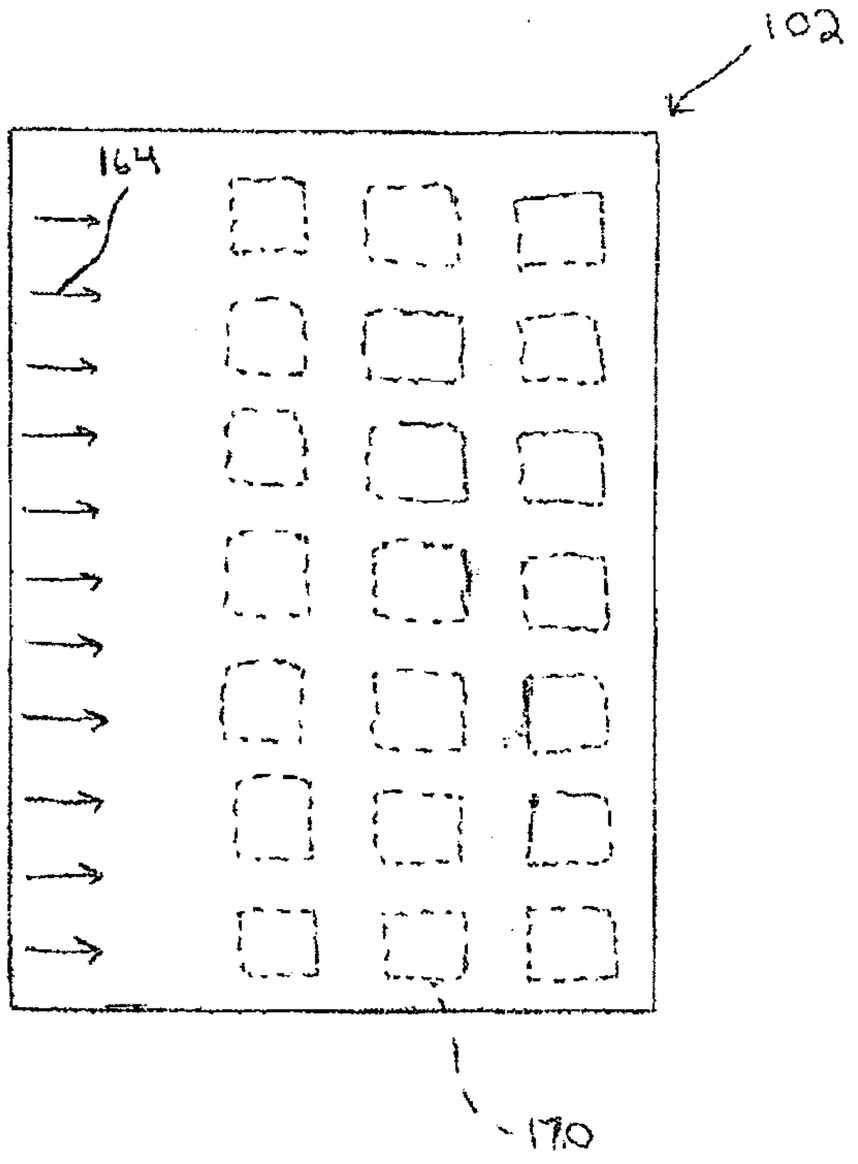


FIG. 1C

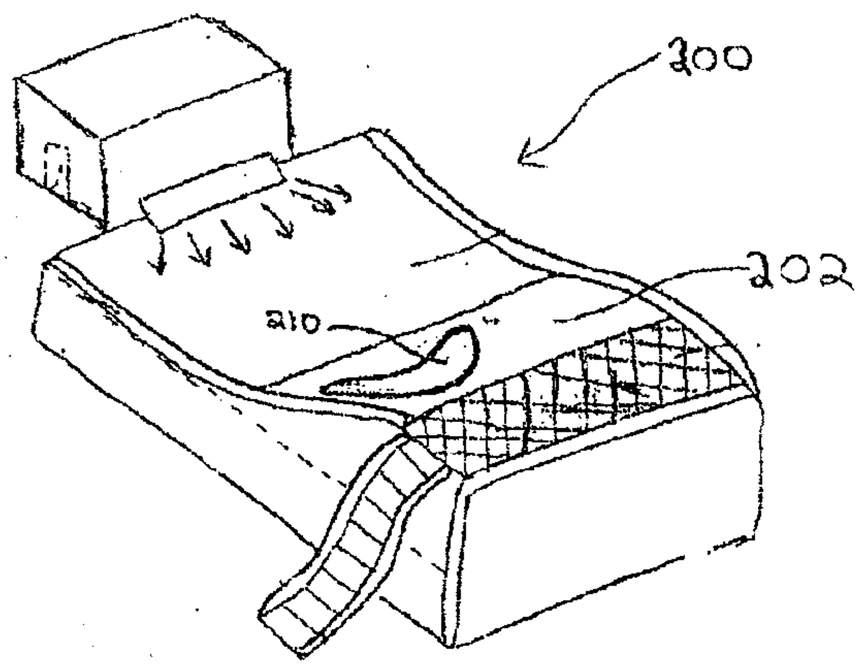


FIG. 2

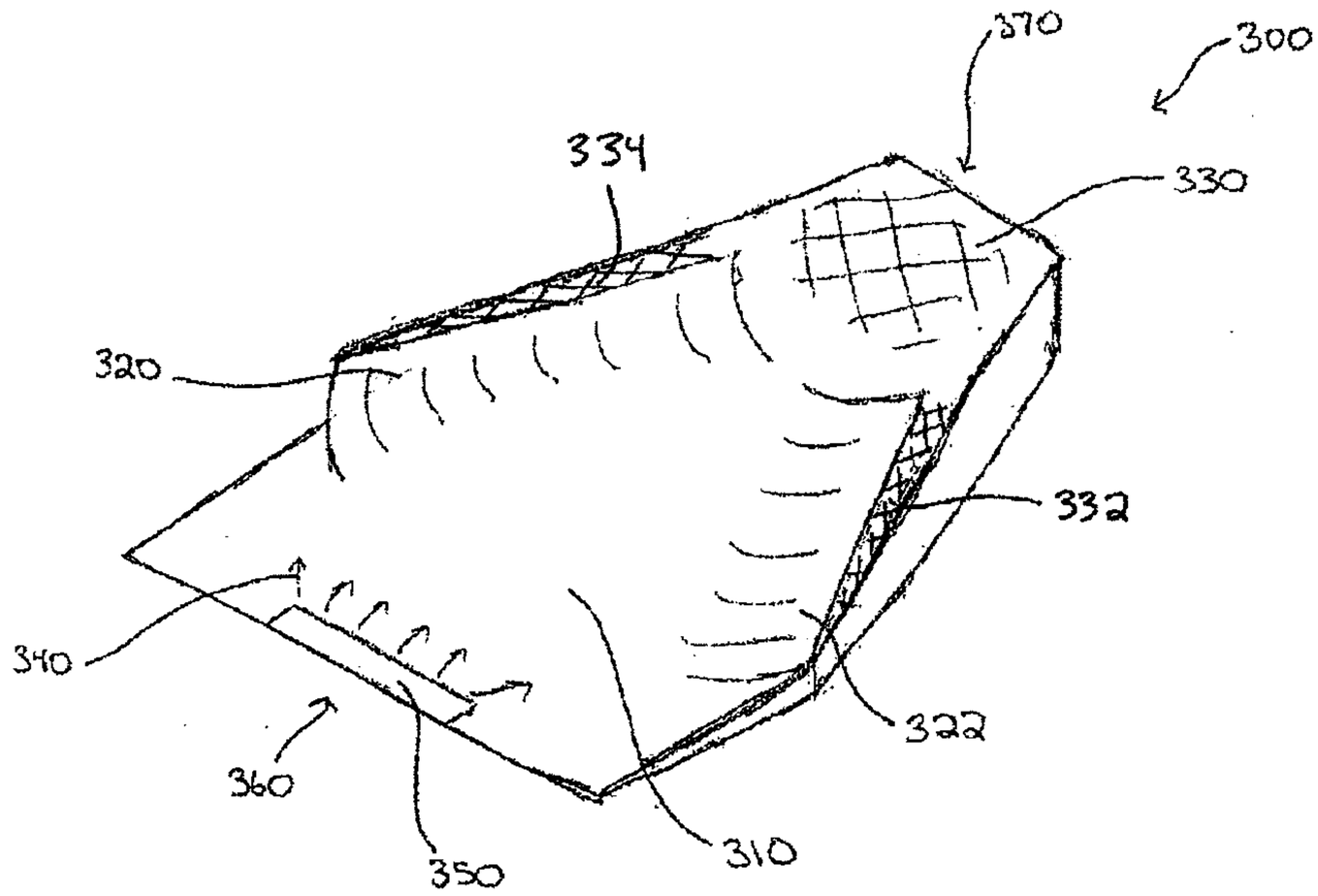


FIG. 3

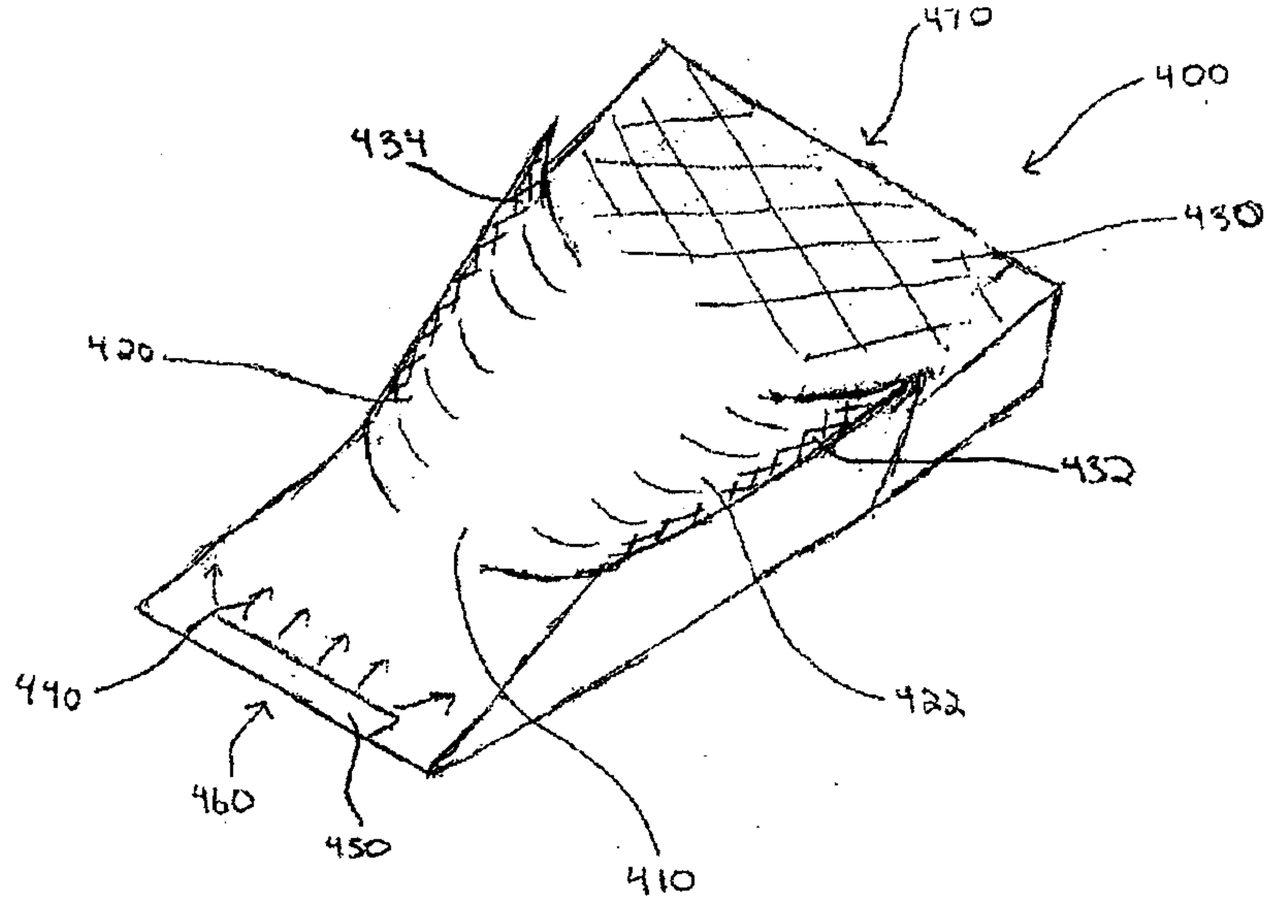


FIG. 4

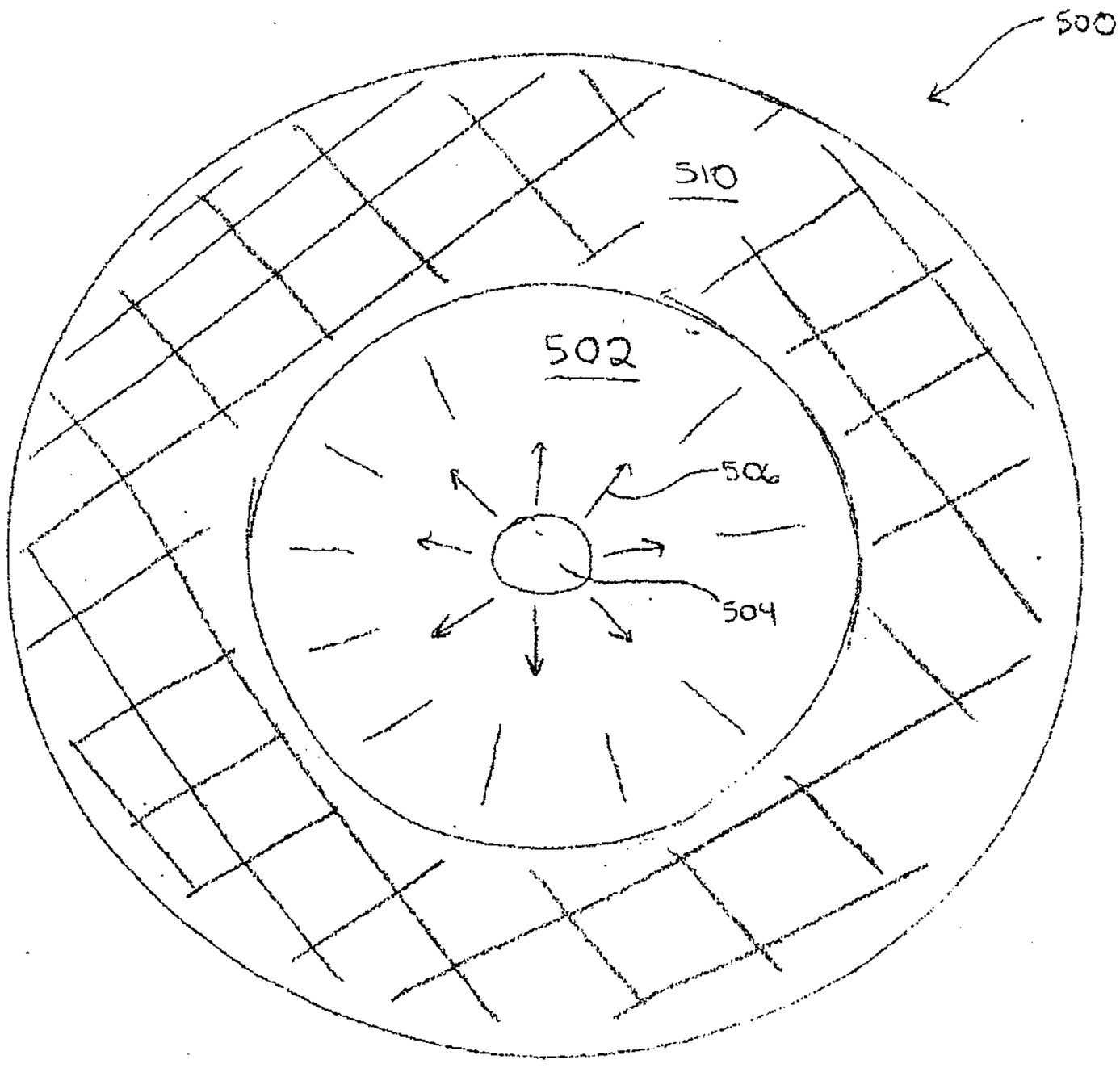


FIG. 5

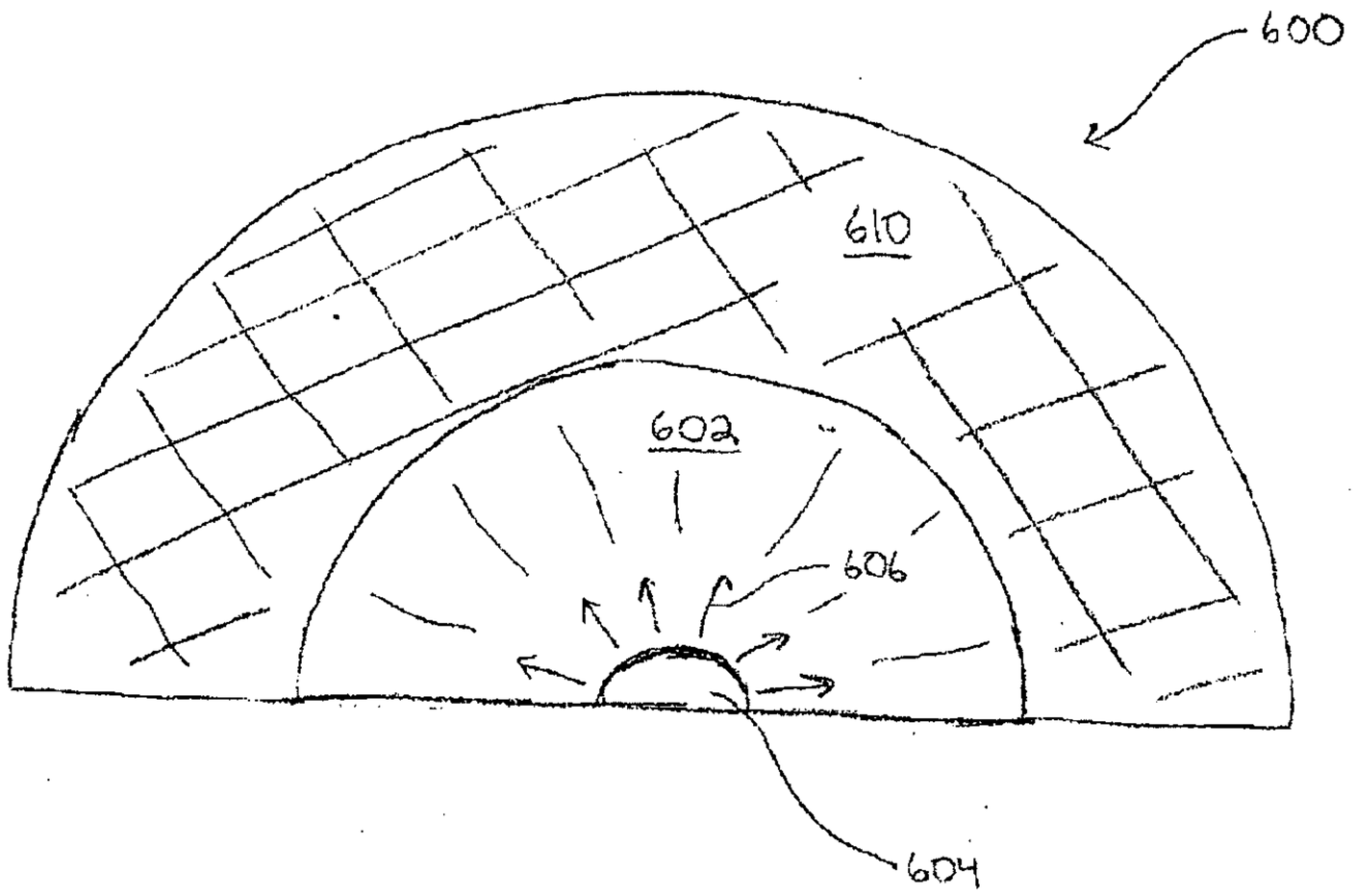


FIG. 6

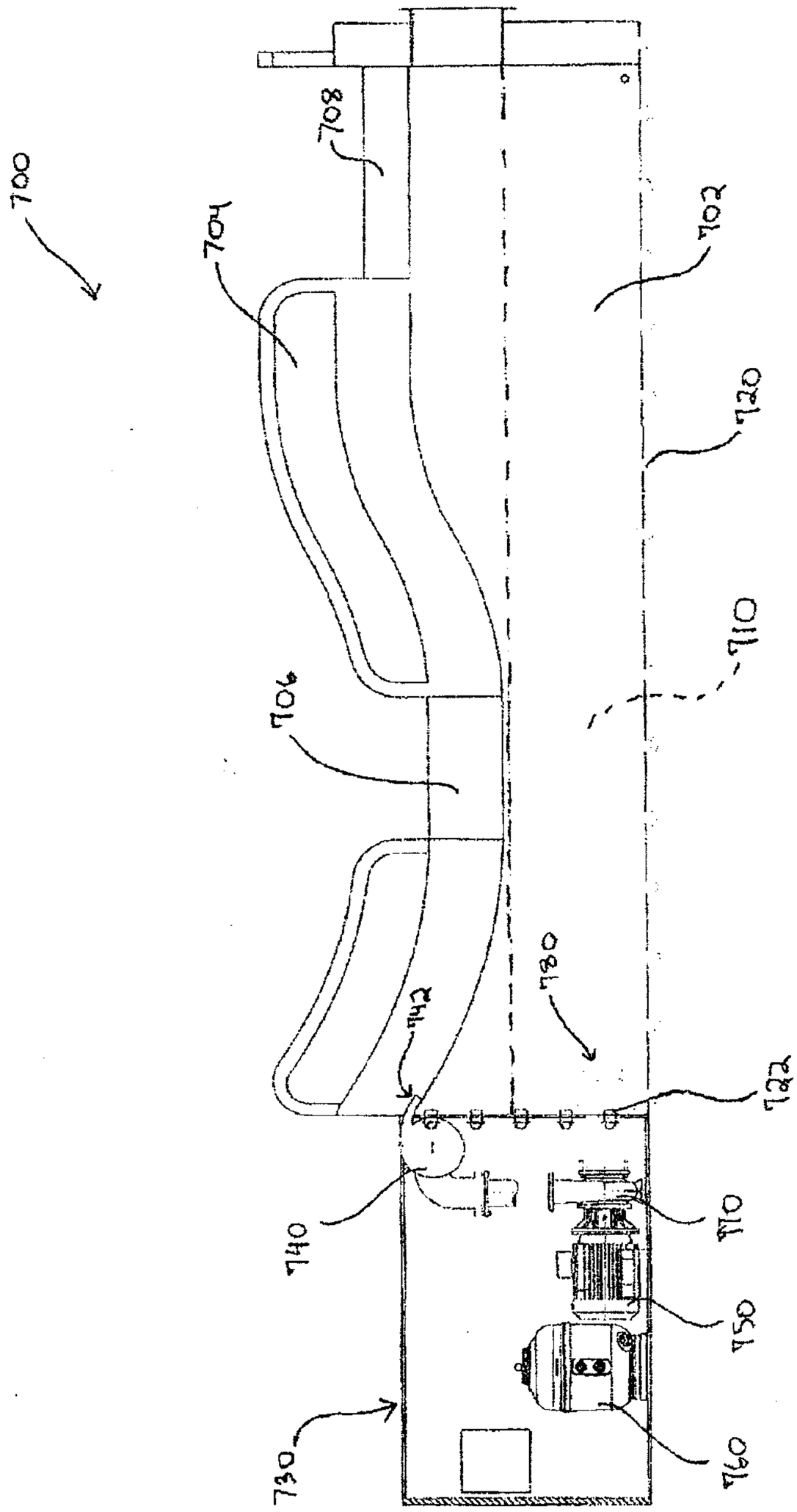


FIG. 7A

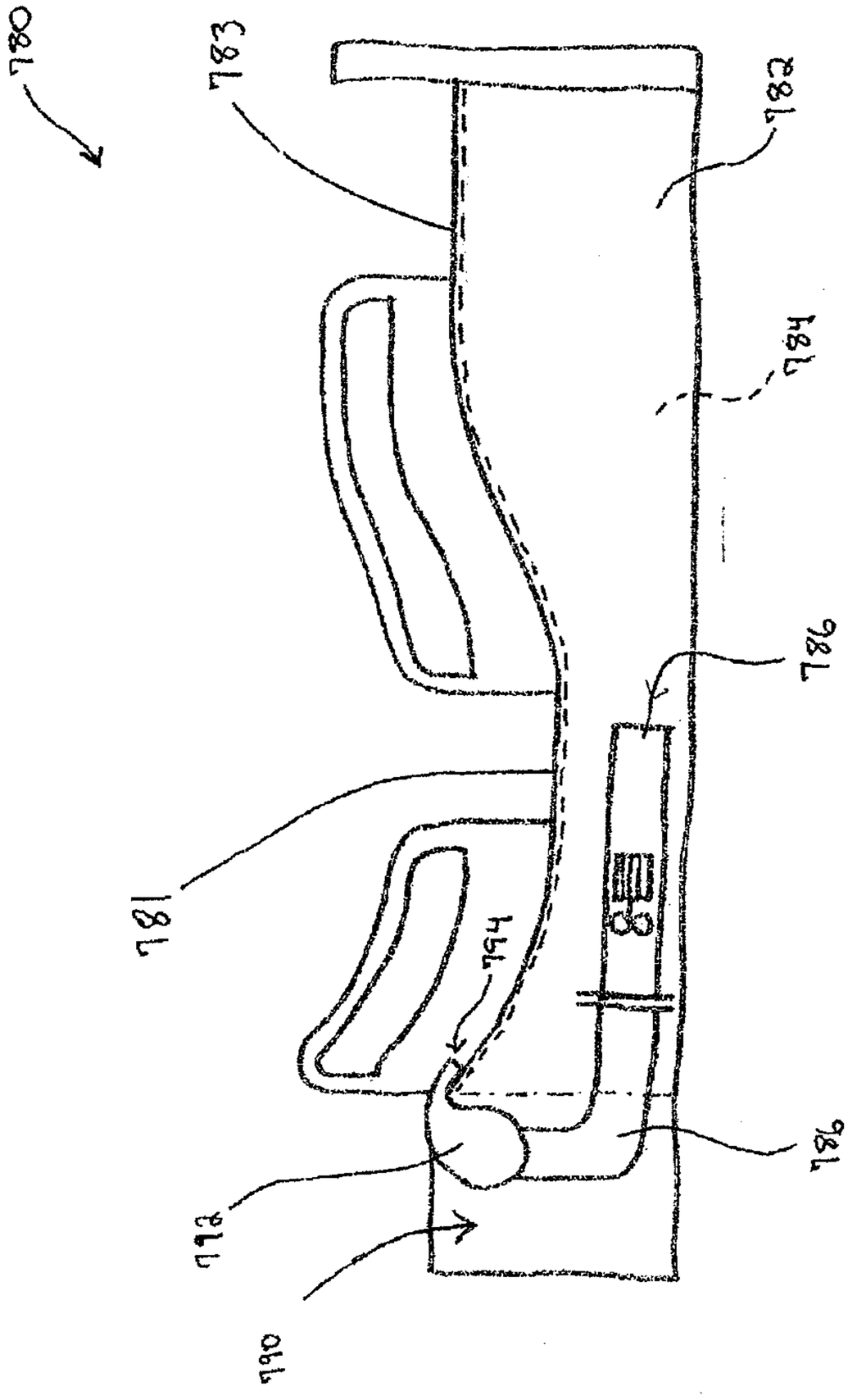


FIG. 7B

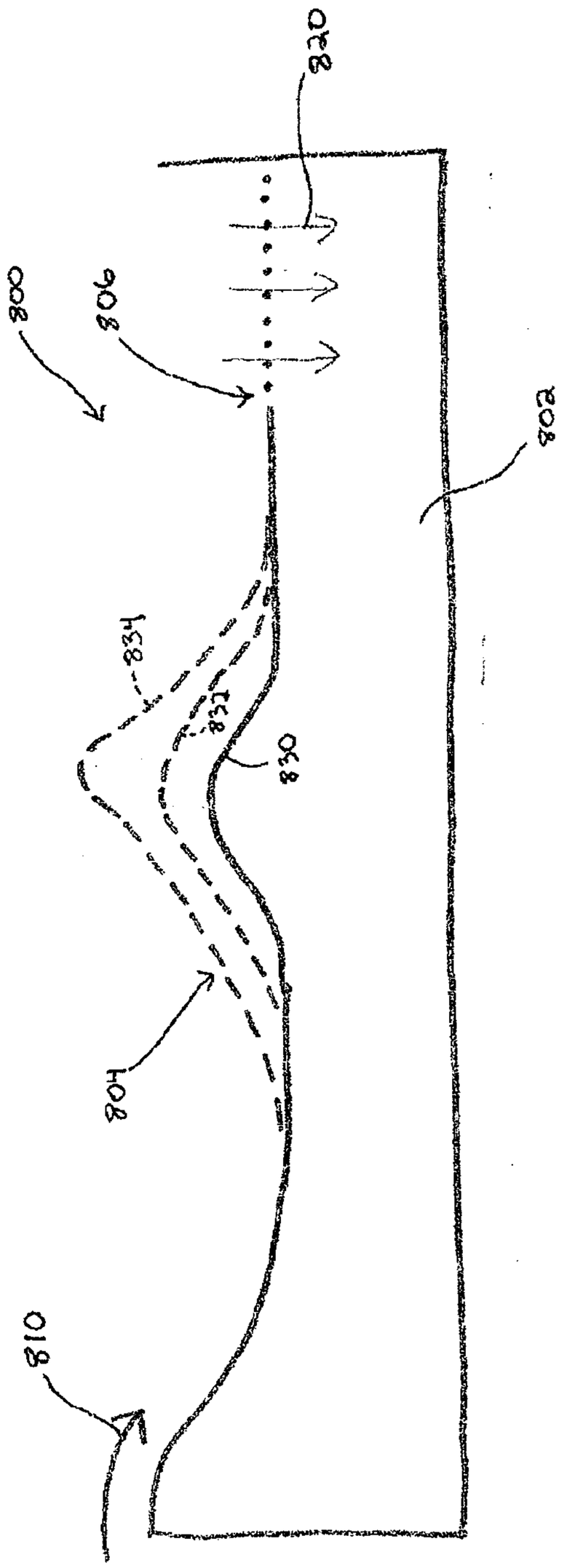


FIG. 8A

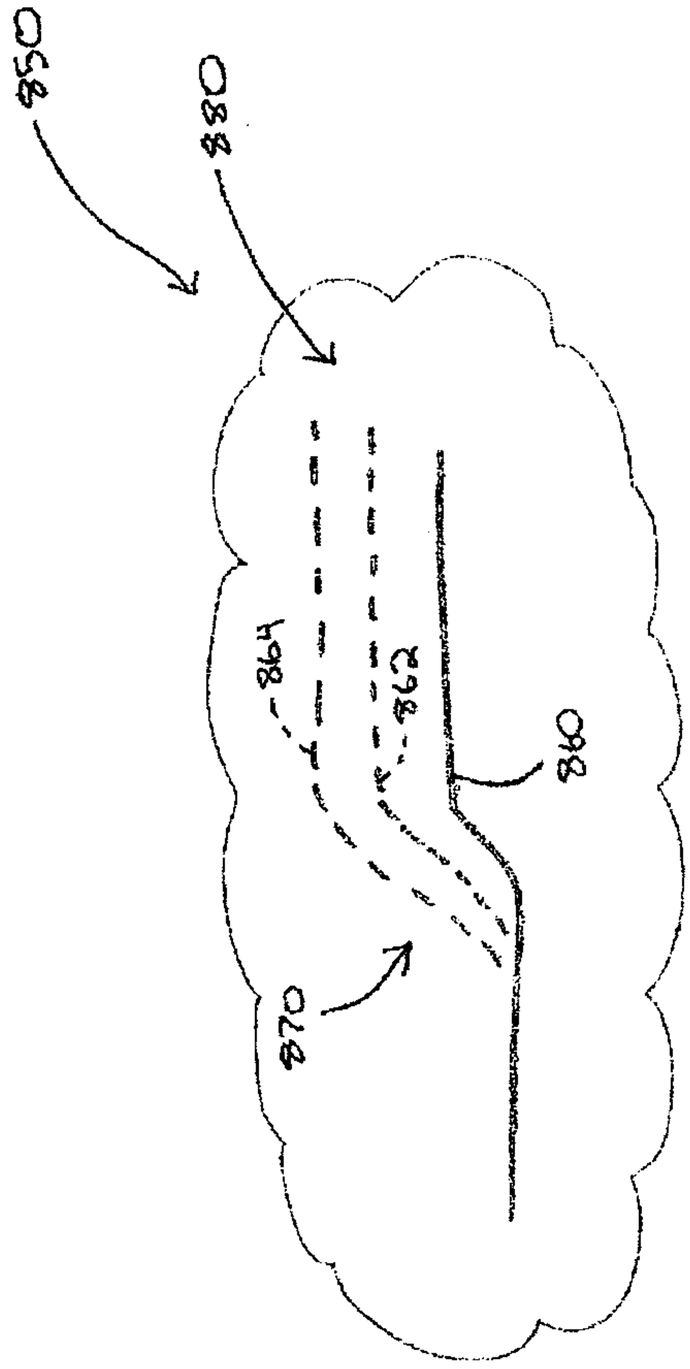
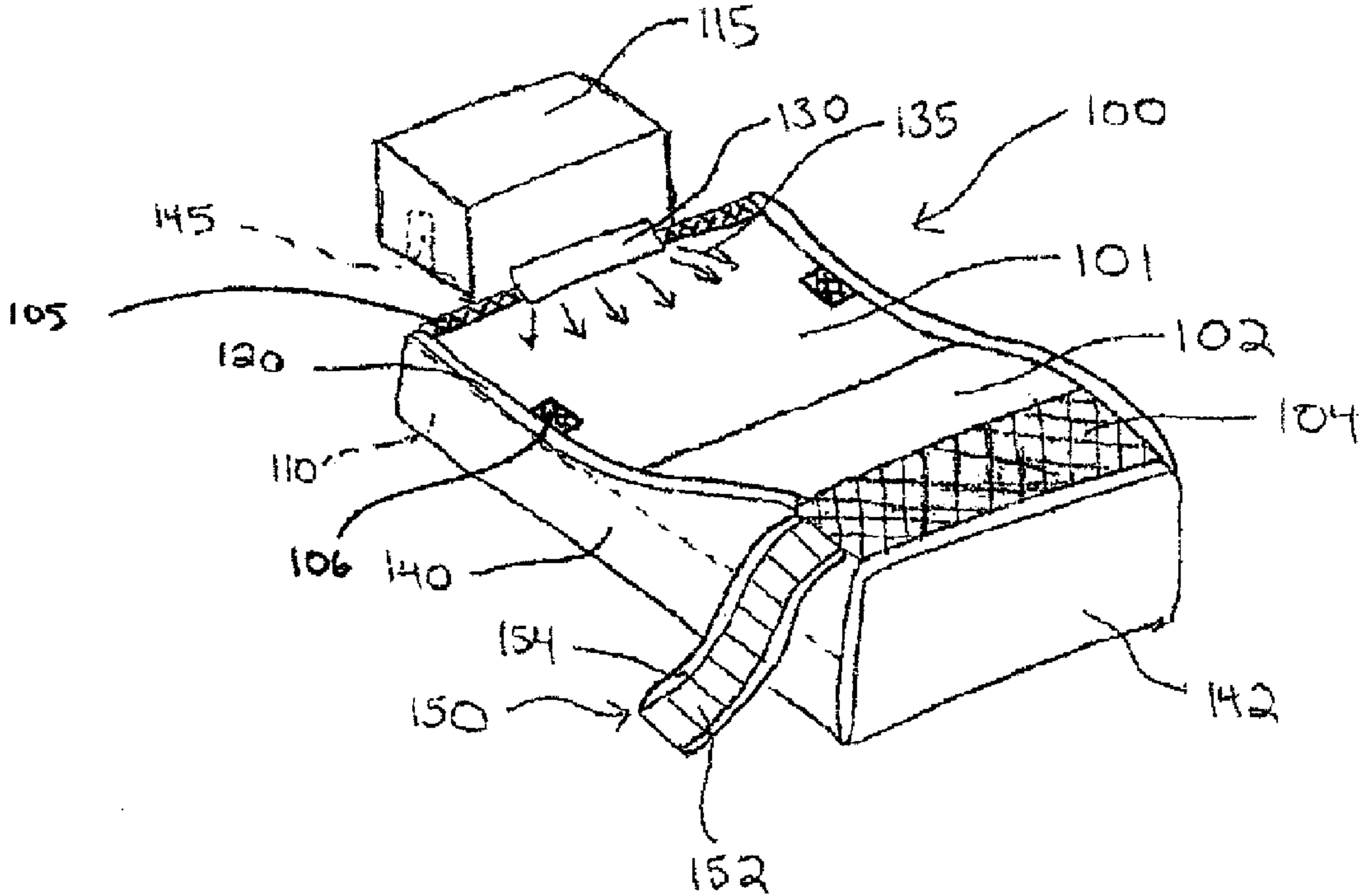


FIG. 8B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