

TITLE OF INVENTION: POD FOR HEALTHCARE

FIELD OF THE INVENTION

[0001] The invention relates to a pod for a user to lie in.

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BACKGROUND OF THE INVENTION

[0002] There are people who are confined to a bed for prolonged periods of time due to certain medical conditions. For example, elderly classified with severe dementia, paralysed patients and comatose patients. The elderly with dementia may have complete cognitive impairment like not recognising family members and complete dependence on others for all Active Daily Living (ADLs). These bedridden patients suffer many problems due to the prolonged time lying on a bed.

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[0003] Bed sore prevention requires regular hourly turning throughout the day. Existing solutions include pressure sore prevention air mattresses and automated mechanical weight shifting mattresses.

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[0004] Falls are common even with optimal fall prevention methods adopted like restrainers or body harness, beds or mattresses that are at the floor level without being raised on legs or cot sides, fall alarms and monitoring sensors, and beds with automated fall sensing mechanical response - lowering of beds with imminent fall risk sensed.

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[0005] Soilage of diapers requires constant diaper changing, odour from the stained clothes and bed linen related to urinary and faecal excretion creates an unpleasant environment for the elderly in both air-conditioned and non-air-conditioned rooms, as well as caregivers, workers and family. An alternative waste collection of the patient is through urethral catheterisation and vacuum enabled anal seal for collection and faecal wastage management systems. The latter is conditional on the faecal waste being rendered liquefied through diet, medications or laxatives to enable the system to be deployed successfully. Solid wastes generally are not managed with such systems. Continuous nutritional feeds pump to the patient may be via nasogastric tube or other enteral tube feeding. However,

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intermittent nasogastric tube feeding frequently leads to aspiration risk and consequently pneumonia.

5 [0006] Another issue is with temperature control. Most elderly do not tolerate the cold in an air-conditioned environment well; conversely excessive perspiration coupled with enhanced bacterial survival and growth in a non-airconditioned room in the tropical climate creates hygiene issues. HEPA filtered ventilation systems and bacteria resistant curtains, screens, flooring and bed linen may be used to improve hygiene and reduce infections.

10 [0007] Lack of positive mental stimuli for the elderly and overabundance of negative physical discomfort stimuli result in the generation of negative emotions and moods giving rise to agitation and delirium. Non-individualised positive mental stimulation may be provided to the patient through ward sound systems or piped in music and visuals displayed in the homes.

15 [0008] Another problem is with the human resource scarcity. The number of caregivers needed for an elderly person with severe dementia is at least two dedicated caregivers at any time. The healthcare workers may suffer backache performing and facilitating physical transfers of the elderly for bathing, changing of clothes and bed linen, and feeding. A solution may be to use transfer assist robots and devices such as lifting systems may be used to improve ergonomics for
20 healthcare workers.

SUMMARY OF THE INVENTION

25 [0009] In a first aspect, there is provided a pod comprising a base structure with a cavity; a cover attached to the base structure and covering the cavity, the cover movable to allow access to the cavity; and a solution bag configured to be placed within the cavity and contain a solution to allow a user to lie on the solution bag and experience neutral buoyancy.

30 [0010] In an embodiment, the solution bag is mouldable when filled with the solution to allow the solution bag to contort to fit a movement of the user and allow the user to remain at neutral buoyancy.

- [0011] In an embodiment, the pod further comprises a fabric sheet around at least part of the solution bag that the user lies on, wherein the fabric sheet is water repellent. Preferably, the fabric sheet comprises a nanocoating on the fabric sheet to make the fabric sheet water repellent.
- 5 [0012] In an embodiment, the fabric sheet comprises a sleeve to form a pocket to accommodate at least a lower body region of the user.
- [0013] In an embodiment, the fabric sheet further comprises a temperature variation mechanism and/or a drying mechanism.
- [0014] In an embodiment, a surface of the solution bag that the user lies on has
10 a nanocoating to make the surface water repellent.
- [0015] In an embodiment, the cover is a retractable cover or a sliding cover.
- [0016] In an embodiment, the pod further comprises at least one water inlet in a first region of the base structure; and a drainage mechanism at a second region of the base structure.
- 15 [0017] In an embodiment, the drainage mechanism comprises at least one drainage groove and a drainage reservoir.
- [0018] In an embodiment, the pod further comprises a rocking mechanism to tilt the base structure.
- [0019] In an embodiment, the pod further comprises the solution in the solution
20 bag, preferably the solution comprises 25 wt. % to 35 wt. % of magnesium sulfate, a pH of 7.2 to 7.8, and a specific gravity of 1.24 to 1.29.
- [0020] In an embodiment, the solution bag comprises an influx valve to infuse the solution into the solution bag; and an efflux valve to drain the solution from the solution bag.
- 25 [0021] In an embodiment, the pod further comprises a plurality of sensors to measure vital signs and physiological parameters of the user.
- [0022] In an embodiment, the pod further comprises a temperature controller and a temperature modification device.
- [0023] In an embodiment, the pod further comprises a humidity controller and a
30 humidity modification device.
- [0024] In an embodiment, the pod further comprises an audiovisual system.

[0025] In an embodiment, the pod further comprises an ozone generator.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 [0026] Figure (FIG.) 1 shows a top plan view of an embodiment.
[0027] FIG. 2 shows a side perspective view of an embodiment.
[0028] FIG. 3 shows a longitudinal side cross sectional view of an embodiment.
[0029] FIG. 4 shows a top view of an embodiment.
[0030] FIG. 5 shows a transverse cross-sectional view of an embodiment.

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DETAILED DESCRIPTION OF THE INVENTION

[0031] In the following description, numerous specific details are set forth in order to provide a thorough understanding of various illustrative embodiments of the invention. It will be understood, however, to one skilled in the art, that embodiments
15 of the invention may be practiced without some or all of these specific details.

[0032] Features that are described in the context of an embodiment may correspondingly be applicable to the same or similar features in the other embodiments. Features that are described in the context of an embodiment may correspondingly be applicable to the other embodiments, even if not explicitly
20 described in these other embodiments. Furthermore, additions and/or combinations and/or alternatives as described for a feature in the context of an embodiment may correspondingly be applicable to the same or similar feature in the other embodiments.

[0033] Unless defined otherwise, all technical and scientific terms used herein
25 have the meaning commonly understood by a person skilled in the art to which this invention belongs.

[0034] The phrase “at least one of A and B” means it requires only A alone, B alone, or A and B, i.e. only one of A or B is required.

[0035] Where a range of values is recited, it is to be understood that each
30 intervening integer value, and each fraction thereof, between the recited upper and lower limits of that range is also specifically disclosed, along with each subrange

between such values. The upper and lower limits of any range can independently be included in or excluded from the range, and each range where either, neither or both limits are included is also encompassed within the invention. Where a value being discussed has inherent limits, for example where a component can be present at a concentration of from 0 to 100%, or where the pH of an aqueous solution can range from 1 to 14, those inherent limits are specifically disclosed. Where a value is explicitly recited, it is to be understood that values which are about the same quantity or amount as the recited value are also within the scope of the invention, as are ranges based thereon.

[0036] Although each of these terms has a distinct meaning, the terms “comprising”, “consisting of” and “consisting essentially of” may be interchanged for one another throughout the instant application. The term “having” has the same meaning as “comprising” and may be replaced with either the term “consisting of” or “consisting essentially of”.

[0037] The term “pod” as used herein is used to describe a self-contained unit for a user or person.

[0038] Described herein is a pod 100 for a user 5. FIG. 1 shows a front top view of an embodiment of the pod 100. FIG. 2 shows a perspective side view of an embodiment of the pod 100. The pod 100 contains a base structure 105 and a cover 110. The base structure 105 has a cavity within. In other words, the interior of the base structure has an empty space. The base structure 105 forms the supporting base of the pod 100 and may house the electronics required for the pod 100.

[0039] A solution bag 130 (or resting bag) is placed within the cavity of the base structure 105. The solution bag 130 contains a solution to allow a user 5 to lie on the solution bag 130 and experience neutral buoyancy. An example of the solution is a near saturation solution of magnesium sulfate (25 weight percent (wt. %) to 35 wt. %), with a pH of 7.2 to 7.8 as measured at 25 °C and a specific gravity of 1.24 to 1.29. The magnesium sulfate may be used in the form of Epsom salt (the heptahydrate of magnesium sulfate). The solution bag 130 may be provided with an influx valve to infuse the solution into the solution bag 130 and an efflux valve to

drain the solution from the solution bag 130. A pump may also be provided to infuse and/or drain the solution, or via gravity.

[0040] The solution bag 130 when filled with the solution is configured to be placed within and fill the cavity of the base structure 105. The filled solution bag 130 is mouldable and allows the solution bag to contort to fit a movement of the user and allow the user to remain at neutral buoyancy, like a bean bag. The filled solution bag is flexible to fit the cavity and with the movement of the user 5 which is advantageous as the user 5 lies on the solution bag 130 for prolonged periods of time and ensures comfort for the user while minimising problems associated with prolonged lying.

[0041] In an embodiment, the solution bag 130 may be made of any suitable flexible waterproof material. A fabric sheet or fabric cover may be provided to wrap around at least the part of the solution bag 130 that the user 5 lies upon. The fabric sheet may also completely wrap around the solution bag 130. The fabric sheet may be water repellent. The fabric sheet may be coated with a nanofilm (or nano coating) that is water repellent, in particular the external facing surface of the fabric sheet. The nanofilm may have anti-microbial and bactericidal properties. The nanofilm may be recoated periodically or the fabric sheet may be replaced with a new fabric sheet. The old fabric sheet may be recoated to recycle or disposed of. An example of a nanofilm coating that may be used is described in WO 2009/151403. The nanocoating may be replaced after a period of time, for example 50 weeks, and depends on the coating and use. Advantageously, using a separate fabric sheet from the solution bag may allow the nanocoating on the fabric sheet to be replaced to maintain the properties of the nanocoating. In particular, the fabric sheet may be replaced with another fabric sheet much like the changing of bed sheets. This may lead to lower costs in the long run.

[0042] In the embodiment in FIG. 1, the fabric sheet may have a sleeve 135 that forms a pocket to accommodate a lower body region of the user 5, like a sleeping bag. The sleeve 135 may be sewed to the fabric sheet, attached with a zipper, or a combination of both. FIG. 2 shows the user lying outside the pocket on the sleeve 135.

[0043] In an embodiment, the solution bag 130 is made of the fabric sheet itself or at least the part of the solution bag 130 that the user lies on is made of the fabric sheet. Whilst the solution bag 130 itself may be recoated with the nanofilm and substituted with a new solution bag 130 as per the previous embodiment, the material of the solution bag 130 is likely to be thicker as it needs to hold the solution within and consequently the costs for coating the nanofilm may be higher but has less components. Making the solution bag 130 with the fabric sheet with the nanocoating and another suitable material may lower the costs of the materials used but may also be more difficult to manufacture as two materials need to be combined to make the solution bag 130. The solution bag 130 hugs the body of the user 5 snugly as it is mouldable and the shape of the solution bag 130 moulds to conform to the body of the user. This is different from a mattress which a person simply lies on, whilst the mattress may inevitably sink due to the weight of the user 5 and mattress spring it is not mouldable. Furthermore, there is no frame to hold the solution bag 130 rather the interior of the base structure 105 is the container that holds the solution bag 130. The body of the user 5 sinks into the solution bag 130 and the solution bag 130 moulds itself around the user, rather than a flat rigid surface support. Advantageously, with the user lying on the solution bag 130, it eliminates the risk of drowning and/or fear of drowning of the user 5.

[0044] The cover 110 fits over the cavity of the base structure 105 to enclose the cavity and form the pod 100. The cover 110 has two ends or parts – a first end and a second end. The first end may be where the head of the user 5 is positioned while the second end is where the leg of the user 5 is placed. The first end of the cover may be provided with a transparent cover 115 which may be a plastic glass cover 115. The plastic glass cover 115 may be poly(methyl methacrylate) or polycarbonate as known in the art. The transparent cover 115 may be attached to the lower half of the cover with a hinge 120. This allows the transparent cover 115 to be opened for access to the user 5.

[0045] The second end of the cover 110 may be provided with at least one sliding panel 125 to provide access to the cavity. FIG. 1 and FIG. 2 shows two sliding panels 125 but the number of sliding panels 125 may be easily varied by the design.

[0046] In various embodiments, the cover 110 may be opened as a whole, or opened partially via the transparent cover 115 or the sliding panel 125. The cover 100 may be mechanically or electrically operated.

[0047] The pod 100 may be provided with a water inlet 140 or water spray
5 situated proximally to the first end of the cover 110 or at the first end of the cover 110. The water inlet 140 may be attached to the base structure 105 or the cover 110. The purpose of the water inlet 140 is to spray water to bathe the user 5 and/or the interior of the pod 100. A drainage mechanism is provided to remove the water from the pod 100. In an embodiment, a drainage reservoir 160 may be situated
10 proximally to the second end of the cover 110 or at the second end of the cover 110. As the solution bag 130 and fabric sheet if present is water repellent, the water from the water inlet does not collect or soak the solution bag 130 and fabric sheet. instead, the water drains off towards the drainage reservoir 160. The nanocoated fabric sheet ensures the waste is not absorbed or stuck on the solution bag 130 but
15 easily removed with water. The cleaning solution and water is easily run off the fabric sheet into the drainage reservoir 160. The drainage reservoir 160 may be connected to a water outlet to drain the water off with or without a valve or may be manually emptied. In an embodiment, the drainage reservoir 160 may be a tank or bag which may be emptied or replaced as required. A drying mechanism may also
20 be provided in the pod to dry the user and/or pod 100 after the washing. Examples of the drying mechanism include a fan, and a dehumidifier.

[0048] The water inlet 140 and drainage reservoir 160 along with the water repellent nature of the fabric sheet and solution bag 130 allows the user to be bathed and washed directly in the pod 100. The water may be used to wash off any human
25 waste like faeces and urine or perspiration of the user. Water from the water inlet 140 may be used to directly clean or bathe the user and the interior of the pod 100. As the fabric sheet and solution bag 130 is water repellent, the water is not trapped but instead flows towards the drainage reservoir 160 where it can be removed. A drying mechanism may be used to dry the user and the interior of the pod. This is
30 extremely important and useful for a user dependent on a caregiver for cleaning and washing them. A single caregiver can clean and bathe the user without needing to

move the user to a toilet or bathroom. This avoids the risk of the user suffering an accident when moving and also reduces the number of caregivers required.

[0049] FIG. 3, FIG. 4 and FIG. 5 show another embodiment of the pod 100. FIG. 3 shows a side cutaway view of the longitudinal side of the pod 100. FIG. 4 shows a top view of the pod 100. FIG. 5 shows a side cutaway view of the transverse side of the pod where the user's legs are.

[0050] The pod 100 has a base structure 105 with a cavity within in which the solution bag 130 as described above is placed. The user 5 is able to lie on the solution bag 130 and a head support 137 like a pillow may be provided and also for the other embodiment.

[0051] The pod 100 may be provided with a flexible retractable curved cover 110 or door which may be kept in a storage recess 112 when it is fully retracted as shown in FIG. 4 when not in use. The retractable cover 110 may be pulled out from the storage recess 112 to cover the user 5 in the pod. The cover 100 may be mechanically or electrically operated.

[0052] In FIG. 4 the retractable cover 110 is retracted and kept in the storage recess. In FIG. 3 and FIG. 5, the retractable cover 110 is partially pulled out such that it is approximately halfway across the cavity of the base structure 105. The storage recess 112 as shown in FIG. 4 may be placed at one longitudinal side of the pod 100 and the retractable cover 110 may be pulled out and across to the opposite longitudinal side where it may be secured by any suitable locking mechanism, non-limiting examples include a magnetic lock, an electronic lock, a latch, and a snap fit. The location of the storage recess 112 may be varied and the type of cover 110 may also be varied as required. A transparent cover 115 may be provided over the user's head as well.

[0053] One or more water inlets 140 may be provided in the base structure 105 as shown in FIG. 3 to FIG. 5. One or more drainage grooves 145 may be provided in the base structure 105 to drain away water after bathing or washing the user 5 or the pod 100 into a drainage reservoir 160. The drainage mechanism thus comprises the one or more drainage grooves 145 and the drainage reservoir 160.

[0054] In the embodiment in FIG. 3 to FIG. 5, the base structure 105 may be mounted on a platform 150 which may be a general rectangular shape. The platform 150 may be provided with lockable wheels 155 typically four wheels at each corner of the rectangular shaped platform 150. The platform 150 may be hollow to hold a collection tray 160 which acts as the drainage reservoir to collect the wastewater and material from the cavity of the base structure 105 via the drainage grooves 145.

[0055] As an example, the height of the pod 100 in FIG. 3 to FIG. 5 may be divided into three specific regions, the lowest height (h_3) may be 20 centimetres (cm) where the height of the wheels 155, platform 150, and bottom of the base structure 105 forms the lowest height (h_3). The middle height (h_2) is generally the height or depth of the cavity in the pod 100 and may be 60 to 65 cm, a specific example would be approximately 63 cm. The top height (h_1) is the maximum height that the retractable cover 110 reaches as it is pulled out to the other side of the pod 100, and may be approximately 30 cm. These heights are non-limiting and merely provide a comfortable height for the caregiver and user 5 to use the pod 100. The length (or longitudinal side) of the pod 100 as shown in FIG. 4 may be approximately 215 cm. The length may be adjusted as necessary to accommodate the components of the pod 100 and the general or average height of the user 5. The width (or transverse side or horizontal side) of the pod 100 may be approximately 95 cm and may be adjusted as necessary to accommodate the components of the pod 100 and the user 5.

[0056] The pod 100 in the embodiments may be provided with a rocking mechanism which may tilt the base structure 105 or the pod 100 slightly clockwise and anti-clockwise. The rocking mechanism may be electronically controlled. The rocking mechanism may be automated such that it is set to tilt the base structure 105 at predetermined times, for example every 2 hours, every 3 hours, every 4 hours, every 6 hours, every 8 hours or every 12 hours. The base structure 105 or pod may be tilted up to an angle (α) of 30° as measured from the horizon as shown in FIG. 5. In an embodiment, the angle (α) may be up to 20° . In an embodiment, the angle (α) may be up to 15° . This enables automated a gentle rocking motion of the

base structure 105 to shift the skin contact pressure points of the user 5 without need for manual intervention

[0057] The pod 100 may be provided with a plurality of sensors to measure vital signs and physiological parameters of the user, for example heart rate, breathing rate, temperature, blood pressure, and other parameters of the user.

[0058] The pod 100 may be provided with a temperature controller and a temperature modification device to heat or cool the temperature within the pod 100 as necessary. For example, the sleeve 135 may be provided with a temperature variation mechanism to heat or cool the user 5 and/or a drying mechanism. The preferred temperature in the pod 100 may depend on the user 5 and the environment. A machine learning model may be trained on the conditions of the interior and external environment of the pod 100 and measure vital signs and physiological parameters of the user. The machine learning model may subsequently adjust the temperature and humidity levels accordingly in response to the user body core temperature and physiological parameters like heart rate, autonomic system related vasodilation.

[0059] The pod may be provided with a humidity controller and a humidity modification device. The preferred humidity level in the pod 100 may depend on the user 5 and the environment.

[0060] An audiovisual system may be provided in the pod 100 to provide personalised content to the user 5. The audiovisual system may play music and/or videos to the user. The audiovisual system may play the user's favourite songs and family home videos or movies on continuous mode at the first end of the cover 110 and pod 100 to provide positive mental stimulation to the user. The audiovisual system may also allow the user to make video or voice calls with other people.

[0061] An ozone generator may be provided in the pod 100 for periodic sanitation of the pod 100.

[0062] The pod 100 may be provided with a power source, controllers, and electrical circuitry required to operate the various features of the pod described. The features of the pod 100 described above may make use of electrical and/or mechanical components and mechanisms.

[0063] The pod 100 allows a user 5 to lie on the solution bag 130, and optionally in the pocket beneath the sleeve 135, and float at neutral buoyancy. The interior environment of the pod 100 may be controlled with temperature and humidity sensors, controllers and modification devices to adjust the temperature and humidity of the interior of the pod 100. The pod 100 provides a womb-like environment for the user to be in. advantageously, the swaddling sleeve on the surface of the bag may eliminate fear of drowning by providing a blanket like structure. The fabric sheet prevents skin irritation from prolonged exposure to the chemical solution within the solution bag 130.

[0064] The neutral buoyancy bag 130 for the user 5 to lie in is able to prevent bed sores and is supported in a pod-like frame 105. The provision of wheels 155 allow easy movement of the pod-like frame 105 and also enable automated gentle rotation of the pod-like frame to shift the skin contact pressure points of the user without need for manual intervention. The nano-coated fabric of the neutral buoyancy bag 130 allows the automated infusion of water and/or cleansing solution via inlets 140 in the walls of the pod-like frame 105 with easy water run-off from the non-absorbent nano-coated surface. The user 5 or pod 100 may be dried naturally or with climate-controlled zip cover made of the nano-coated fabric. The zip cover has inlaid climate control system to warm or cool or dry the user.

[0065] By allowing the user to lie on top of the solution bag 130 with neutral buoyancy in a womb-like environment, this obviate risk of falls of the user, eliminate risk of bed sores of the user, and control body temperature to the very degree Celsius for comfort which may be automatically controlled with AI enabled climate control in response to the pod embedded body core temperature and physiological parameters like heart rate, autonomic system related vasodilation. The user 5 may be naked inside the pod 100 and removes the need to change clothes and diapers as the pod is opaque and the anti-bactericidal design of the bag fabric optimise comfort with dignity in a clean, odour free, and pleasantly scented environment.

[0066] This reduces the need for physically demanding work of transferring and lifting the user 5 and improve the distribution of healthcare manpower resources equitably.

[0067] The pod 100 improves safety and reduce health hazards for the user being cared for and also protects the caregiver from injury while improving productivity of the healthcare worker force.

5 [0068] Whilst the pod 100 is intended for use for patients who need to spend prolonged periods in bed like elderly patients with severe dementia, paralysed patients and comatose patients, it is not limited as such, and any person can use the pod even a healthy person.

[0069] Reference numbers

5 – user	100 – pod	105 – base structure
110 - cover	115 – transparent cover	120 - hinge
125 – sliding panel	130 – solution bag	135 - sleeve
140 – water inlet	145 – drainage groove	150 - platform
155 - wheel	160 – drainage reservoir / collection tray	

CLAIMS

[Claim 1] A pod comprising a base structure with a cavity; a cover attached to the base structure and covering the cavity, the cover movable to allow access to the cavity; and a solution bag configured to be placed within the cavity and contain a solution to allow a user to lie on the solution bag and experience neutral buoyancy.

[Claim 2] The pod according to claim 1, wherein the solution bag is mouldable when filled with the solution to allow the solution bag to contort to fit a movement of the user and allow the user to remain at neutral buoyancy.

[Claim 3] The pod according to claim 1 or claim 2 comprising a fabric sheet around at least part of the solution bag that the user lies on, wherein the fabric sheet is water repellent.

[Claim 4] The pod according to claim 3, wherein the fabric sheet comprises a nanocoating on the fabric sheet to make the fabric sheet water repellent.

[Claim 5] The pod according to claim 3 or claim 4, wherein the fabric sheet comprises a sleeve to form a pocket to accommodate at least a lower body region of the user.

[Claim 6] The pod according to claim 5 wherein the fabric sheet further comprises a temperature variation mechanism and/or a drying mechanism.

[Claim 7] The pod according to claim 1 or claim 2, wherein a surface of the solution bag that the user lies on has a nanocoating to make the surface water repellent.

[Claim 8] The pod according to any one of claims 1 to 7, wherein the cover is a retractable cover or a sliding cover.

[Claim 9] The pod according to any one of claims 1 to 8 comprising at least one water inlet in a first region of the base structure; and a drainage mechanism at a second region of the base structure.

- 5 [Claim 10] The pod according to claim 9, wherein the drainage mechanism comprises at least one drainage groove and a drainage reservoir.

[Claim 11] The pod according to any one of claims 1 to 10 comprising a rocking mechanism to tilt the base structure.

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[Claim 12] The pod according to any one of claims 1 to 9 comprising the solution in the solution bag, preferably the solution comprises 25 wt. % to 35 wt. % of magnesium sulfate, a pH of 7.2 to 7.8, and a specific gravity of 1.24 to 1.29.

- 15 [Claim 13] The pod according to any one of claims 1 to 10, wherein the solution bag comprises an influx valve to infuse the solution into the solution bag; and an efflux valve to drain the solution from the solution bag.

- 20 [Claim 14] The pod according to any one of claims 1 to 11 comprising at least one of the following:

- (i) a plurality of sensors to measure vital signs and physiological parameters of the user;
- (ii) a temperature controller and a temperature modification device;
- (iii) a humidity controller and a humidity modification device;
- 25 (iv) an audiovisual system; and
- (v) an ozone generator.