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(54) HEAT-ACCUMULATING HEATER

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(57) **ABSTRACT**

A heat-accumulating heater includes a powdery paraffinic latent heat storage substance sealed in a bag-shaped container. The bag-shaped container includes a plurality of inner container members formed of sheets impermeable to the heat storage substance and water and permeable to air. The inner container members are each received in one of first substantially rectangular outer container members made of rubber that are connected to each other in a row so as to be bendable relative to each other. An air layer is present between each inner container member and the corresponding first outer container member, thereby preventing the inner container member from being pressed against the first outer container member. The first outer container members are in turn received in a second outer container member made of cloth.

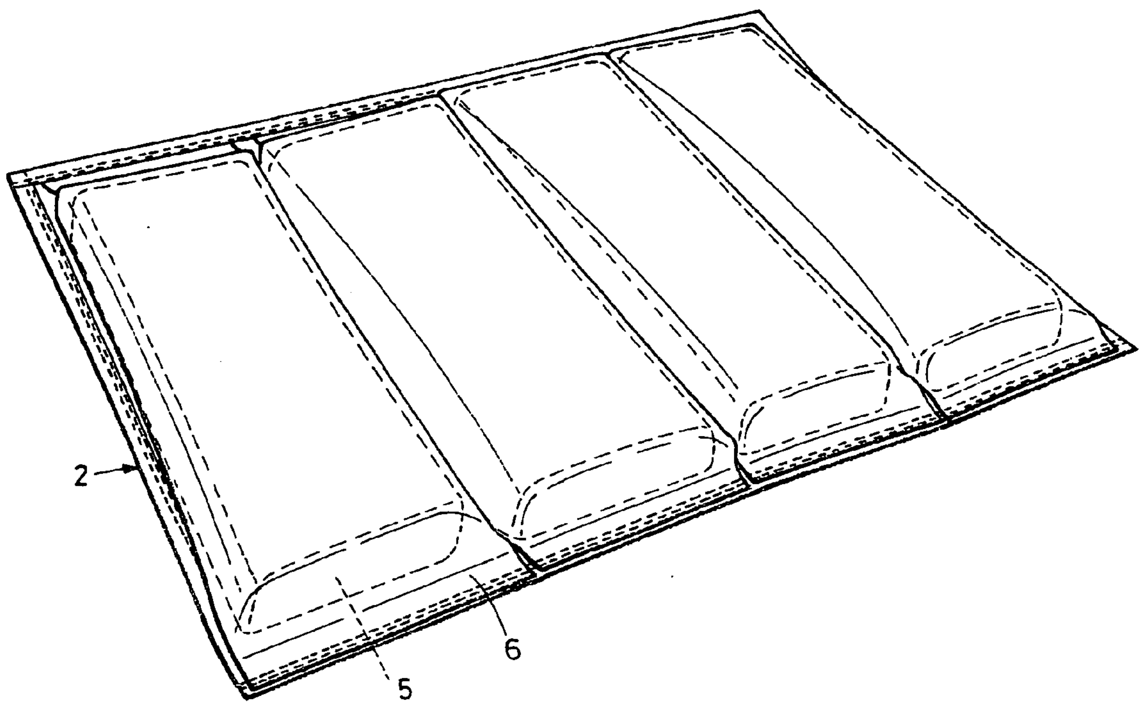


Fig.1

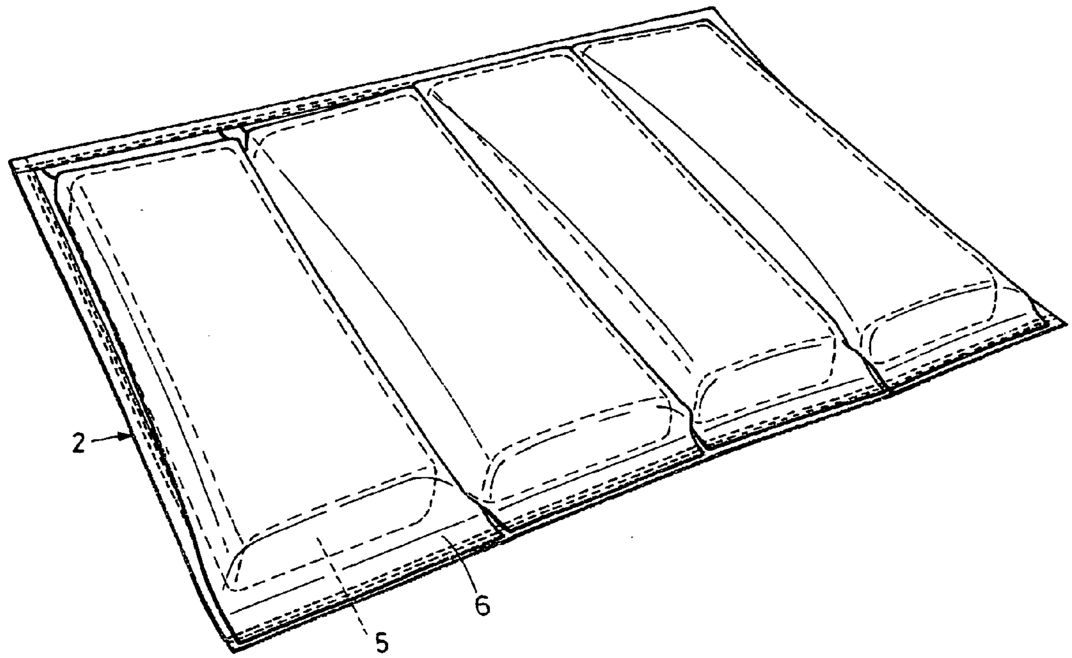


Fig.2

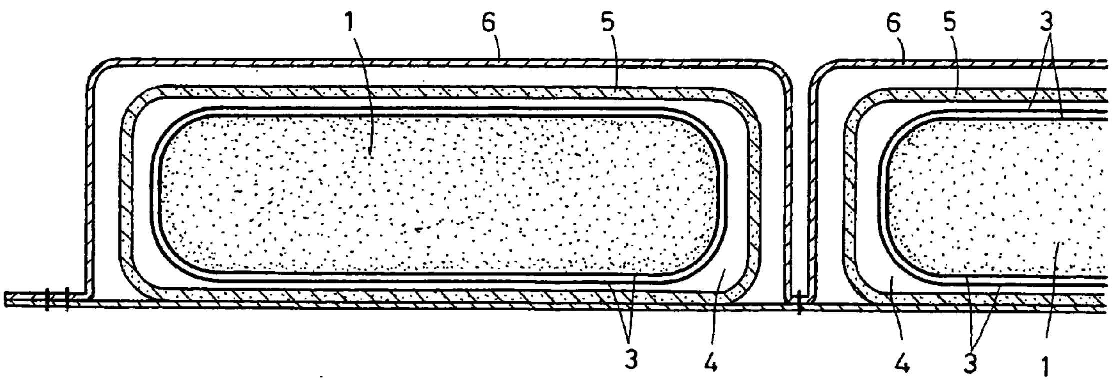


Fig.3

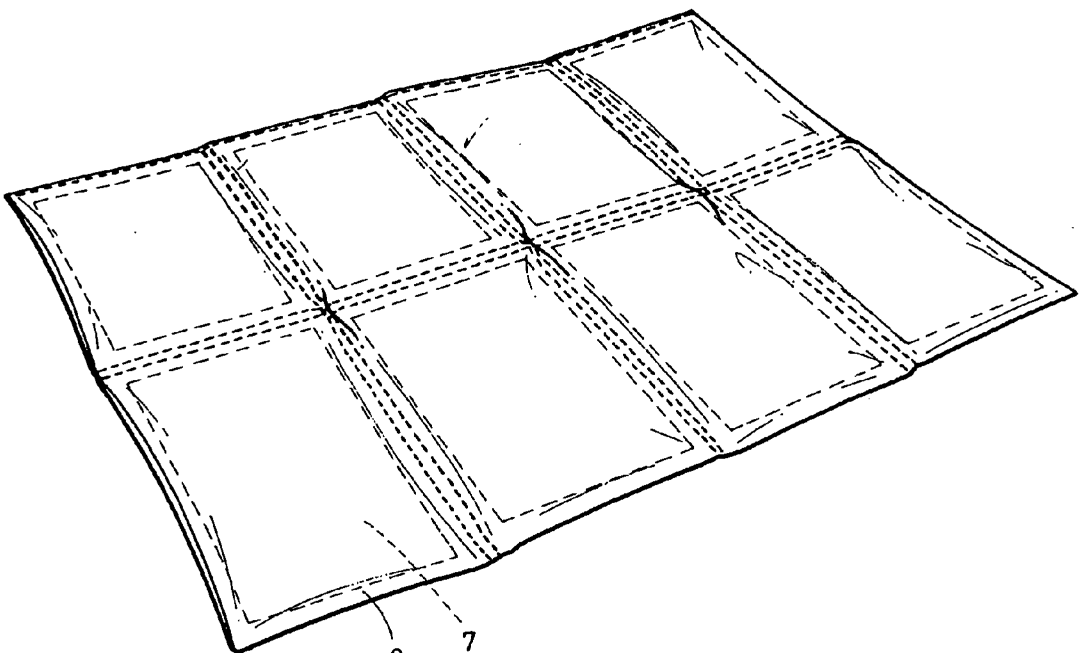


Fig.4

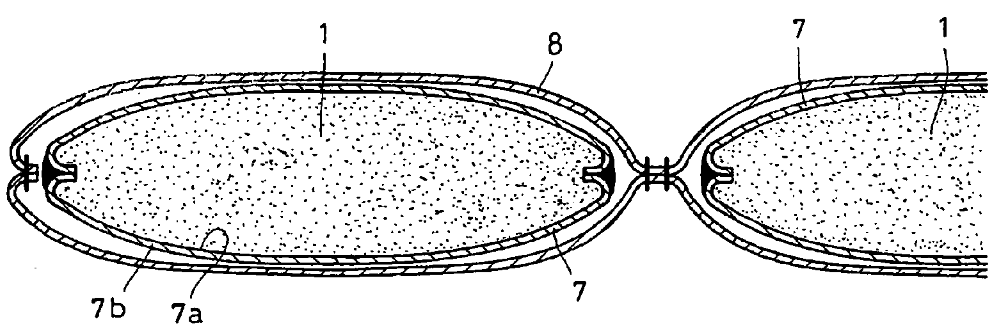


Fig.5A

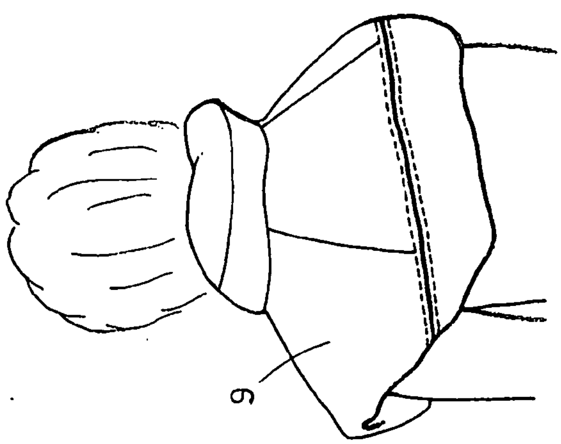


Fig.5B

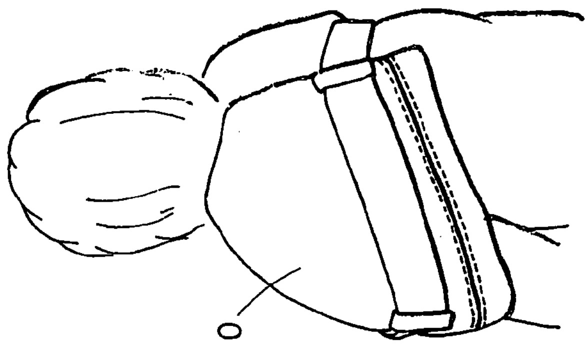
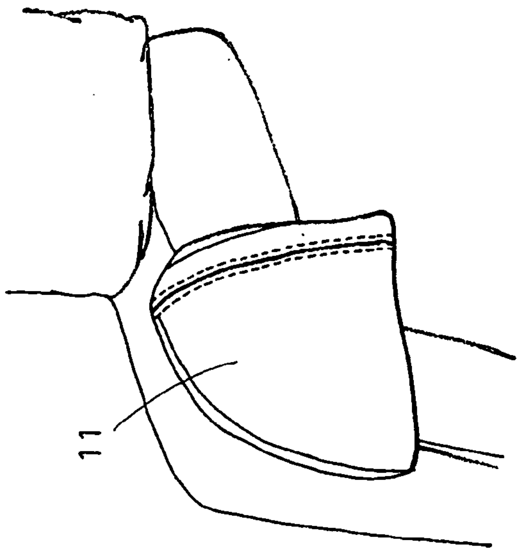


Fig.5C



HEAT-ACCUMULATING HEATER

BACKGROUND OF THE INVENTION

[0001] This invention relates to a heat-accumulating heater including a latent heat storage material and used for health and medical purposes such as in thermotherapy for heating part of a human body.

[0002] Heat-accumulating heaters, which are also called hot compressions or hot packs, applies heat to the surface of a human body, thereby increasing the bloodstream and suppressing pain. Recent studies also revealed that they can increase the body muscle mass. Such heat-accumulating heaters can be used, for example, for rehabilitation after disease, care for the elderly, and maintenance of the body muscle mass before and after sports activities.

[0003] Heat-accumulating heaters or hot packs are controlled under the pharmacy law in Japan as medical appliances. More specifically, they are classified as general medical appliances (class 1) or controlled medical appliances (class 2). These hot packs can be sold only after investigation as to their adaptability and verification by the Ministry of Health, Labor and Welfare. Because hot packs are produced under strict quality control and technical control, technical glitches or quality deficiencies are rare compared to other ordinary products.

[0004] Taking into consideration the main functionality of hot packs, i.e. thermal properties, medical examination on the time during which hot packs are applied, and their general properties, that is, in view of economical efficiency, safety and environmental consideration, it is expected that new products will be developed.

[0005] It is considered that hot packs should most desirably be brought into contact with human skin at a temperature within the range of 40 to 43° C. If this temperature exceeds 43° C., the user may suffer low-temperature burn injuries if the hot pack is applied for a long time. It is also required that sufficient calories be stably supplied to an affected area and that such heat packs be able to heat the affected area to a sufficient depth, thereby improving bloodstream, reducing pain or recovering muscle power, as desired.

[0006] In other words, it is required that such hot packs be able to sufficiently heat the affected area to a sufficient depth for a prolonged period of time in a stable manner

[0007] As means for transferring temperature and heat to a human body, it is necessary to develop a heat-accumulating heater that is considered to be advantageous from functional, safety and economic points of view. For this purpose, it is necessary to consider the mechanism of heat buildup of the hot pack, its temperature and calorific value, and evaluate its medical effect, handling and cost, and its influence on the environment and safety.

[0008] Known heat therapeutic appliances include one disclosed in JP Utility Model Publication 61-057919, which comprises a water-impermeable container, a heat storage material having a melting point of 40-80° C. and sealed in the water-impermeable container, and a bag made of water-permeable and gas-permeable cloth and containing the water-impermeable container.

[0009] Another heater is disclosed in JP Utility Model Publication 02-124451A, which comprises particles comprising a gel in which a wax having a melting point near the body temperature is absorbed and dispersed in water, and a container in which the water-dispersed particles are sealed.

[0010] The heat storage material used in the prior art as mentioned above is in the form of a liquid or particles dispersed in a liquid. Thus, the heat storage material tends to shift in the container in the gravitational direction, thus making it difficult to cover a wide area of a human body with the heater, irrespective of the position of the human body.

[0011] JP Patent Publication 2004-75711A discloses a technique in which a porous carrier is impregnated with a latent heat storage substance in the form of liquefied paraffin and then the impregnated carrier is covered with and sealed in a synthetic resin, thereby preventing leakage or dissipation of the liquefied paraffin.

[0012] JP Utility Model Registration 3125565 discloses a hot pack comprising a powdery heat storage substance which is sealed in a container so as to prevent shifting in the container and enclosed in a rubber or elastomer material.

[0013] But in this case, when the paraffinic latent heat storage substance is formed into powder particles and hermetically sealed in a container in the form of a small bag, and then the hot pack is used in an air-tightly sealed state while preventing absorption of moisture, heated and expanded air in the container tends to gradually leak from the container during repeated heating and heat release. As a result, the container is collapsed under the atmospheric pressure, so that the paraffinic latent heat storage substance in the container is compressed and solidifies. Thus, flexibility of the hot pack is lost, which makes it difficult to apply the hot pack on an affected area of a human body so as to be deformed along the contour of the affected area.

[0014] An object of the present invention is to provide a heat-accumulating heater of the type comprising a powdery paraffinic latent heat storage substance which is air-tightly sealed in a container in the form of a bag, in which the paraffinic latent heat storage substance in the form of solid powder particles always remains fluid, thereby ensuring sufficient flexibility of the entire heater so that the heater can be perfectly fit on an affected area of a human body.

[0015] Another object of the invention is to provide a heat-accumulating heater which can cover a wide area of a human body because it can be perfectly fit on any part of the human body, whereby it is possible to sufficiently and stably heat the affected area for a sufficiently long period of time.

SUMMARY OF THE INVENTION

[0016] To achieve the objects, the present invention provides a heat-accumulating heater comprising a container in the form of a bag and a paraffinic latent heat storage material in the form of powder that is sealed in the container, the container comprising an inner container member formed of at least one sheet, an outer container member covering the inner container member with an air layer disposed therebetween, the sheet forming the inner container member being impermeable to the latent heat storage material and water and permeable to air.

[0017] With this arrangement, because the powdery paraffinic latent heat storage substance in the inner member is isolated from water outside the container by the sheet forming the inner container member, the paraffinic latent heat storage substance is always kept dry and its fluidity is never impaired by moisture. Because the air in the inner container member communicates with the exterior of the container, even when heating and heat release are repeated, the air pressures inside and outside the inner container member are kept equal. This prevents the paraffinic latent heat storage substance from being compacted due to a pressure difference between inside and outside the inner container member, thus preventing impairment of its flowability.

[0018] The outer surface of the inner container member is always exposed to the air between the inner and outer container members. This increases air permeability of the inner container member. The outer container member may not be air permeable if it is made of a material that allows completely airtight seal. But practically, in view of the cost, the outer container member is made of an air-permeable material. In order to positively ensure air permeability, vent holes of a suitable size may be formed in the outer container member.

[0019] In order to supplement the above-mentioned functions of the inner container member, the outer container member is preferably made of a material impermeable to the powdery latent heat storage material and water.

[0020] In order to improve the fitting properties and cushioning properties, the outer container member is preferably made of an elastomer.

[0021] With this arrangement, because the paraffinic latent heat storage substance is held in the inner container member so as to be freely flowable, and further held by the elastically deformable outer container member, the entire heater can be sufficiently elastically deformable under the pressure from e.g. skin. Thus, the heat-accumulating heater according to the present invention is soft to the touch.

[0022] The heat-accumulating heater according to the invention is flexible as a whole, and can be deformed along any contour of the affected area. This makes it possible to maximize the heat transfer area, and improve fitting and cushioning properties.

[0023] In order to increase the latent heat of fusion and to stably supply maximum calories, the latent heat storage material preferably comprises porous powder particles impregnated with a paraffinic latent heat storage substance, or microcapsules containing a paraffinic latent heat storage substance.

[0024] In order to ensure air-permeability of the inner container member and to further strengthen impermeability to the powdery latent heat storage material and water, the sheet forming the inner container member preferably comprises one of a synthetic resin sheet, a metal foil, and a metal-deposited synthetic resin sheet.

[0025] A sensible heat is preferably 40 to 43° C. In order to stably keep the sensible temperature within this range, the outer container member has preferably heat insulating properties, and the latent heat storage material comprises a paraffinic latent heat storage substance comprising a saturated hydrocarbon having a carbon number of 28 to 32 and capable of being heated to 60 to 70° C. A saturated hydrocarbon having a carbon number of less than 28 is not preferable because its liquid-solid phase change occurs at a temperature lower than 60° C., and thus it is heated only to a temperature lower than 60° C. If the saturated hydrocarbon has a carbon number larger than 32, its liquid-solid phase change point exceeds 70° C., and thus it is heated to a temperature higher than 70° C., which is not preferable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] Other features and objects of the present invention will become apparent from the following description made with reference to the accompanying drawings, in which:

[0027] FIG. **1** is a perspective view of a first embodiment;

[0028] FIG. **2** is a partial sectional view of the first embodiment;

[0029] FIG. **3** is a perspective view of a second embodiment;

[0030] FIG. **4** is a partial sectional view of a second embodiment; and

[0031] FIGS. **5**A to **5**C are perspective views of other embodiments.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0032] Now the embodiments of this invention are described with reference to the drawings.

[0033] FIGS. **1** and **2** show a heat-accumulating heater according to the first embodiment, which is in the form of a bag-shaped container **2** divided into four sections, each section comprising an inner container member **3** in which a latent heat storage substance **1** is sealed and formed of a sheet impermeable to the latent heat storage substance **1** and water and permeable to air, and a first substantially rectangular outer container member **5** formed of a rubber sheet (having a thickness of about 2 mm) and covering the inner container member **3** through an air layer **4** so as not to closely contact the inner container member **3**. The bag-shaped container **2** further includes a second outer container member **6** made of cloth and accommodating the four first outer container members **4**, which are arranged in a row, such that the adjacent outer container members **4** can be bent relative to each other.

[0034] The inner container members **3** are formed of at least one sheet in which the paraffinic latent heat storage material in the form of powder is directly charged as a heating medium. Preferably, the inner container members **3** are formed of at least two sheets to prevent leakage of the latent heat storage medium and ensure waterproofness.

[0035] It is required that the sheet forming the inner container members **3** be impermeable to the powdery latent heat storage substance and water and permeable to air. Preferably, this sheet has also high rigidity and sealability.

[0036] This sheet may be a waterproof (hydrophobic) film, such as a nylon sheet, aluminum sheet, aluminum-deposited sheet, and vinyl chloride sheet.

[0037] As explained above, if air in the inner container members is small in amount, flowability of the powder particles or beads decreases and they tend to solidify. To prevent this, the inner container members have to be permeable to air. For this purpose, microscopic holes that do not permit passage of the powdery latent heat storage substance and water (e.g. holes having a diameter of 0.1 to 10 μm) are formed in the inner container members by well-known physicochemical means, thereby improving air permeability of the inner container members.

[0038] In order for the hydrophilic sheet to have air permeability, phase separated layers comprising mixtures of fillers such as $BaSO_4$ or $CaCO_3$ and different kinds of polymers may be formed in the hydrophilic sheet. Alternatively, a substance that can be extracted in a later step may be microscopically dispersed in the sheet, and the substance may be extracted after forming the sheet to form pores in the sheet. Further alternatively, continuous micropores may be formed by means of continuous microscopic foaming using a foaming agent.

[0039] Specific examples thereof include porous films made of polytetrafluoroethylene or urethane resin and formed with numerous irregularly arranged micropores having a diameter of 0.1 to 10 μm. A sheet that is impermeable to water and permeable to air can also be formed by subjecting the surface of a non-woven fabric made of e.g. cellulose to water-repellent treatment. Also, a water-resistant film and an air-permeable film may be laminated one on the other.

[0040] Commercially available water-repellent and air-permeable sheets include UNILAX RS made by Idemitsu Unitech Co., Ltd., which comprises three laminated films, which are polypropylene films and other polyolefin films.

[0041] The inner container members may be formed of a single sheet. Or for reinforcement, it may be formed of two or more laminated or simply superposed sheets so as not to impair its characteristics.

[0042] Commercially available laminated sheets which comprise a polypropylene spunbond woven fabric on which the above-mentioned UNILAX RS film made by Idemitsu Unitech Co., Ltd. is laminated include STRAMIGHTY MF made by Idemitsu Unitech Co., Ltd. (air permeability 11.0 ml/cm2·sec (KES method))

[0043] The outer container members **5** and **6** cover the inner container members through the air layers so as not to closely contact the inner container members. Their materials and shaped are not particularly limited. They may be partially or entirely made of the same material as the material of the inner container members.

[0044] The paraffinic latent heat storage substance used in this invention is a powdery material. The carbon numbers of saturated hydrocarbons vary widely. According to the present invention, a saturated hydrocarbon having a carbon number of 19 or over is used. In particular, since a suitable temperature of a heat pack is considered to be 40 to 43° C., taking into consideration the heat conduction of the container members in which the heating medium is packed, a saturated hydrocarbon which undergoes a phase change at 60 to 70° C. Hydrocarbons that undergo a phase change at 60 to 70° C. have a carbon number of 28 to 32.

[0045] By using a compound that undergoes a phase change, it is possible to store heat not only due to the specific heat of the substance but also heat due to latent heat consumed when the substance undergoes a phase change from solid to liquid. This makes it possible to store heat by several tens of times, and to use the heat storage calorie produced during a phase change from liquid to solid.

[0046] For a heat pack, large amounts of calories are required for a long period of time. But only with the specific heat value, the efficiency is low. By adding latent heat, it is possible to ensure sufficient calories for a heat pack. Conventional heat-accumulating heaters are ordinarily used to heat the skin surface for 15 to 30 minutes at 40 to 45° C. According to the present invention, by using calories stored in the heating medium to which latent heat is added, it is possible to provide a heat-accumulating heater with an extremely small volume.

[0047] Another characteristic of such a paraffinic latent heat storage substance is that the temperature is maintained at a predetermined level during a phase change. This is a phenomenon inherent to latent heat, and differs from the relationship between the specific heat value and the temperature. For example, if the heating medium undergoes a phase change from solid to liquid at 70° C., the temperature of the heating medium remains 70° C. until the heating medium entirely turns to liquid by heating. Conversely, if the heating medium, which has been heated to 70° C., turns from liquid to solid, the temperature of the heating medium remains 70° C. until the heating medium entirely turns to solid. By using a heat storage substance that undergoes a phase change at 70° C., the heating medium is kept at 70° C. for a long period of time. According to the present invention, as the heating medium of the heating pack, a saturated hydrocarbon that undergoes a phase change at 60 to 70° C. is preferably mainly used. But considering the fact that the heater of the invention may be used at a temperature range higher or lower than usual, a saturated hydrocarbon that undergoes a phase change within a temperature range of 30 to 80° C. may be used.

[0048] Such a paraffinic latent heat storage substance is processed into powder form so that even if the substance undergoes a phase change, its state remains unchanged. Such a heat storage substance may be in one of the following three forms:

[0049] one comprising powder particles formed by impregnating a porous inorganic compound with a saturated hydrocarbon as described above and coating the compound with a resin to prevent leakage of the hydrocarbon;

[0050] one in the form of beads comprising a core of a saturated hydrocarbon as a heating medium, and an outer shell of cellulose; and

[0051] one in the form of microcapsules comprising a saturated hydrocarbon as a heating medium encapsulated in an acrylic resin shell.

[0052] The powder particles or beads thus obtained are least affected by a form or phase change of the saturated hydrocarbon, which undergoes a phase change, due to a change in temperature of the hydrocarbon, and thus can stably keep their form irrespective of a change in temperature. Such beads or powder particles can be used as the heating medium of the heat pack according to the invention. Preferably, these powder particles have a particle diameter of 30 to 70 μm, and the beads have a diameter of 2.5 to 4.0 mm for retaining efficiency and flowability of the saturated hydrocarbon.

[0053] The paraffinic latent heat storage substance may e.g. powder particles formed by impregnating a porous silicone oxide (also called "porous silica") having a particle diameter of 50 to 100 μm with a hydrocarbon, beads having a diameter of about 5 μm, or microcapsules having a diameter of 1 to 50 μm.

[0054] One of the most important characteristics of such a substance is the purity of the saturated hydrocarbon. The purity of the saturated hydrocarbon is preferably not less than 50% in order to achieve required heat efficiency, more preferably not less than 70%, and most preferably 100%.

[0055] Since the amount of the paraffinic latent heat storage substance is proportional to the heat produced, its amount is determined corresponding to the size of the heater. For example, if the heater measures 37 cm long, 29 cm wide and 3 cm high, and has a volume of 3219 ml, the heater is preferably filled with 1000 g of the powdery paraffinic latent heat storage substance.

[0056] After filling the heater with the heat storage substance, the bag-shaped container is packed by two or three sheets with air layers having a suitable thickness defined between the container and the innermost sheet and between the adjacent sheets to adjust the surface temperature of the heater, i.e. the sensible temperature to 40 to 45° C.

[0057] As also shown in FIGS. **1** and **2**, the heat-accumulating heater of the first embodiment includes a plurality of the first outer container members **5** arranged in a row and retained by the second outer container member **6** so that the heater can be bent. With this arrangement, it is possible to adjust the calorie produced and efficiently use the calorie produced. It is possible to optimally fit the heat-accumulating heater on human bodies.

[0058] The first outer container members may be formed from an elastomer such as natural rubber, synthetic rubber or a thermoplastic elastomer. The second outer container member is preferably formed by sewing thick fabrics such as tent material or bag material, or heat-resistant or high-strength fabrics such as aramid fibers. These fabrics are preferably subjected to waterproofing and/or water-repellent treatment to always keep the interior of the container dry.

[0059] In the heat-accumulating heater of the first embodiment, because the inner container members **3** are formed of a sheet material which can isolate the powdery paraffinic latent heat storage substance retained in the inner container members **3** from water or moisture outside the inner container members **3**, the latent heat storage substance is always kept dry. Thus, its flowability is never impaired by moisture. When heating and heat release are repeated, because the inner container members **3** are permeable air, air pressures inside and outside the inner container members **3** are always kept equal to each other. Thus, the paraffinic latent heat storage substance is never compacted under the pressure difference between inside and outside of the inner container members, so that its flowability is always kept high. This in turn allows the heat-accumulating heater to be deformable corresponding to the shape of the affected area of the patient, thereby maximizing the surface area through which heat is conducted.

[0060] In using the heater of this embodiment, though not particularly limited, the heater may be heated by transferring calories through the atmosphere in a dry state. For example, the heater according to the present invention is heated for 3 to 4 hours using an electric hot air heater to a necessary calorie value. The heating temperature should be equal to or higher than the melting point of the paraffinic latent heat storage substance, and is set at about 30 to 90° C.

[0061] In thermotherapy, the temperature and amount of the heating medium used are decisively important. The temperature and amount are in turn determined by the material of the container. That is, the temperature of the heating medium where the container is made of rubber differs from its temperature where the container is made of thick fabric because these materials have different heat conductivities from each other. Although dependent on the content of air in the container, a fabric pack tends to more quickly lower the temperature of the heating medium. The outer container member has to be made of a material having sufficient strength so that it can withstand repeated use. The heater according to this invention has to be suitably fit on human bodies. For this purpose, the outer container member has to be made of a suitable material having suitable elasticity and has a suitable shape.

[0062] FIGS. **3** and **4** show a second embodiment, in which instead of the inner container members **3** of the first embodiment, inner container members **7** are used which are formed of STRAMIGHTY MF made by Idemitsu Unitech Co., Ltd. (air permeability 11.0 ml/cm2·sec (KES method)), i.e. a commercially available laminated sheet comprising a polypropylene spunbond woven fabric **7***b* on which a UNILAX RS film **7***a* made by Idemitsu Unitech Co., Ltd. is laminated.

[0063] In the second embodiment, because the inner container members **7** are made of reinforced material having high rigidity, the inner container members **7** are directly received in a single outer container member **8** made of cloth, thereby simplifying the structure of the outer container.

[0064] The heat-accumulating heater according to the second embodiment is simpler in structure than the first embodiment but its performance is unchanged.

[0065] The outer container members **6** and **8** of the first and second embodiments are both in the form of a holder made of cloth and capable of holding 4 to 8 outer container members **5** or inner container members **7**. But as shown in FIGS. **5**(*a*) to **5**(*c*), the outer container members **9**, **10** and **1** may be shaped corresponding to a neck, shoulder, knee, etc.

[0066] If it is necessary that not only the outer container member but the entire container have elasticity, this can be done by adjusting the amount of air in the outer container member. The amount of air in the outer container member is adjustable by forming a plurality of small holes in the outer container member. Because the fitting properties and the strength of the heater according to the invention contradict each other, it is important to select a suitable material for the container which makes it possible to achieve both these properties in a balanced manner.

EXAMPLE 1

[0067] This example is a heat-accumulating heater of the same type as the first embodiment. In this example, as the powdery latent heat storage substance, powder was used comprising porous silicon oxide impregnated with 60% of a heat-accumulating substance of which the major component is phase-changing n-paraffin having a melting point of 70° C. (Nopos made by Yamaichi Co., Ltd.).

[0068] The heat-accumulating heater of this example comprises four inner container members each formed of a nylon film bag and a polyethylene film bag that are superposed one on the other, four first outer container members which are in the form of rubber packs and in which the inner container members are received, respectively, and a pack made of a nylon fabric in which the first outer container members are held.

[0069] The heat-accumulating heater thus obtained measured 37 cm long, 29 cm wide and 3 cm high, had a volume of 3219 ml, and weighed 1500 g in total including 800 g of powdery paraffinic latent heat storage substance.

EXAMPLE 2

[0070] This example is a heat-accumulating heater of the same type as the first embodiment. In this example, as the powdery latent heat storage substance, powder was used comprising porous silicon oxide impregnated with 60% of a heat-accumulating substance of which the major component is phase-changing n-paraffin having a melting point of 70° C. (Nopos made by Yamaichi Co., Ltd.).

[0071] The heat-accumulating heater of this example comprises four inner container members each formed of an aluminum coating film bag formed with holes having a diameter of about 0.2 μm and a nylon film bag that are superposed one on the other, four first outer container members which are in the form of rubber packs and in which the inner container members are received, respectively, and a pack made of a nylon fabric in which the first outer container members are held.

[0072] The heat-accumulating heater thus obtained measured 37 cm long, 29 cm wide and 3 cm high, had a volume of

3219 ml, and weighed 850 g in total including 800 g of powdery paraffinic latent heat storage substance.

EXAMPLE 3

[0073] This example is a heat-accumulating heater of the same type as the first embodiment. In this example, as the powdery latent heat storage substance, cellulose beads are used having a diameter of 5 mm and impregnated with a heat-accumulating substance of which the major component is phase-changing n-paraffin having a melting point of 70° C.

[0074] The heat-accumulating heater of this example comprises four inner container members each formed of an aluminum coating film bag formed with holes having a diameter of about 0.2 μm and a nylon film bag that are superposed one on the other, four first outer container members which are in the form of rubber packs and in which the inner container members are received, respectively, and a pack made of a nylon fabric in which the first outer container members are held.

[0075] The heat-accumulating heater thus obtained measured 37 cm long, 29 cm wide and 3 cm high, had a volume of 3219 ml, and weighed 650 g in total including 600 g of powdery paraffinic latent heat storage substance.

EXAMPLE 4

[0076] This example is a heat-accumulating heater of the same type as the second embodiment. In this example, as the powdery latent heat storage substance, powder was used comprising porous silicon oxide impregnated with 60% of a heat-accumulating substance of which the major component is phase-changing n-paraffin having a melting point of 70° C. (Nopos made by Yamaichi Co., Ltd.).

[0077] The heat-accumulating heater of this embodiment comprises four inner container members which are bags formed of STRAMIGHTY MF made by Idemitsu Unitech Co., Ltd. (air permeability 11.0 ml/cm2·sec (KES method)), i.e. a commercially available laminated sheet comprising a polypropylene spunbond woven fabric on which a UNILAX RS film made by Idemitsu Unitech Co., Ltd. is laminated, and an outer container member in the form of a polyester fabric in which the four inner container members are held.

[0078] The thus obtained heaters of Examples 1 to 4 were compared to conventional wet hot compresses using silica gel at Nagasaki University School of Medicine, Health Department.

[0079] As a result, it was discovered heaters of Examples 1 to 4 were superior to the conventional wet hot compresses using silica gel in any of temperature change of the surface of the heat-accumulating heater, temperature change of the skin after heating treatment, change in bloodstream after heating treatment, and the duration of continuous use.

[0080] The heat-accumulating heater according to the present invention is safe and easy-to-use hot pack, which can be taken out of a hot air heating device and used as it is. Also, it has a higher ability to keep high temperature.

What is claimed is:

1. A heat-accumulating heater comprising a container in the form of a bag and a paraffinic latent heat storage material in the form of powder that is sealed in said container, said container comprising an inner container member formed of at least one sheet, an outer container member covering said inner container member with an air layer disposed therebetween, said sheet forming said inner container member being impermeable to said latent heat storage substance and water and permeable to air.

2. The heat-accumulating heater of claim **1** wherein said outer container member is made of an elastomer.

3. The heat-accumulating heater of claim **1** wherein said latent heat storage material comprises porous powder particles impregnated with a paraffinic latent heat storage substance.

4. The heat-accumulating heater of claim **1** wherein said latent heat storage material comprises microcapsules containing a paraffinic latent heat storage substance.

5. The heat-accumulating heater of claim **1** wherein said sheet forming said inner container member comprises one of a synthetic resin sheet, a metal foil, and a metal-deposited synthetic resin sheet.

6. The heat-accumulating heater of claim **1** wherein said latent heat storage material comprises a paraffinic latent heat storage substance comprising a saturated hydrocarbon having a carbon number of 28 to 32 and capable of being heated to 60 to 70° C.

7. The heat-accumulating heater of claim **6** wherein said outer container member has such thermal insulating properties that the sensible temperature is adjustable to 40 to 43° C.

* * * * *