[0157] Figure 28 shows a multifunctional temperature self-regulating eye mask according to Example 21 of the present invention. In this example, the functional material loaded in the carrier layer 531 is urea (120g). The fluid reservoir 535 is loaded with clean water (120g), and the fluid reservoir 535 and the carrier layer 531 are manufactured in one piece, and they are interconnected by the existing one-way valve 536. Just as Example 20, the two fluid reservoirs 535 are respectively arranged on the hanging parts 51. When a user wants a cold compress, he only needs to press the fluid reservoirs 535 with hand to make the clean water loaded in the fluid reservoir 535 flow to the carrier layer 531 and mix with urea, then the cooling effect would be achieved due to endothermic reaction.

Comparative Example 4

[0158] The eye mask in Comparative Example 4 is similar to that in Example 20 except that no thermal-insulation layer is provided, and it is used in the same way as described in Example 20.

[0159] The results show that the duration of the heat generation (in a heat range above 37°C) for the eye mask in Example 20 is about 35 minutes, while it is only about 20 minutes for the eye mask in Comparative Example 4; and the duration of the refrigeration for the eye mask in Example 20 is about 30 minutes, while it is only about 20 minutes for the eye mask in Comparative Example 4. In addition, it has been demonstrated in experiments that due to the thermal-insulation layer according to the invention the heat generation/refrigeration in Example 20 is significantly more homogeneous than that in Comparative Example 4, that is, the eye mask in Example 20 overcomes the problem of the eye mask in Comparative Example 4 which is either too hot or too cold for most of the time it is being used. Compared with Comparative Example 4, the eye mask in Example 20 improves the absorption effect of the skincare and the moisture content of the skin.

WHAT IS CLAIMED IS:

1. A multifunctional temperature self-regulating film, from outside to inside comprising at

least:

a carrier layer loaded with functional materials, and

a thermal-insulation layer directly contacted with the skin;

wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

2. The multifunctional temperature self-regulating film according to claim 1, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

3. The multifunctional temperature self-regulating film according to claim 2, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

4. The multifunctional temperature self-regulating film according to claim 1, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

5. The multifunctional temperature self-regulating film according to claim 4, wherein the flexible water-impermeable material is transparent.

6. The multifunctional temperature self-regulating film according to claim 1, wherein the sealed cavity is loaded with

a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

7. The multifunctional temperature self-regulating film according to claim 6, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered,

the film maintains a heating temperature at 40°C to 55°C, and the heating time lasts 5 to 30 minutes.

8. The multifunctional temperature self-regulating film according to claim 7, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

9. The multifunctional temperature self-regulating film according to claim 8, wherein the oversaturated aqueous solution of sodium acetate is added with a nucleating agent.

10. The multifunctional temperature self-regulating film according to claim 9, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate, and sodium phosphate dibasic dodecahydrate.

11. The multifunctional temperature self-regulating film according to claim 6, wherein at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

12. The multifunctional temperature self-regulating film according to claim 1, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such

that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

13. The multifunctional temperature self-regulating film according to claim 12, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3°C to 20°C, and the cooling time lasts 5 to 30 minutes.

14. The multifunctional temperature self-regulating film according to claim 12, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride and ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

15. The multifunctional temperature self-regulating film according to claim 11 or 12, wherein a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

16. The multifunctional temperature self-regulating film according to claim 11 or 12, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

17. The multifunctional temperature self-regulating film according to any one of claims 1 to 14, wherein the film is ergonomically designed in shape to be applied to various body parts.

18. The multifunctional temperature self-regulating film according to claim 17, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the film to the skin.

19. The multifunctional temperature self-regulating film according to claim 18, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

20. The multifunctional temperature self-regulating film according to claim 11 or 12, wherein the multifunctional temperature self-regulating film is made into a face mask applied to the face, both two sides of the carrier layer loaded with functional materials are provided with a fluid reservoir which is made into a long and narrow strip, and either of the fluid reservoirs is provided with a fixture to attach the face mask to the user's head.

21. The multifunctional temperature self-regulating film according to claim 20, wherein the face mask is 2 mm to 15 mm thick.

22. A method of using the multifunctional temperature self-regulating film according to claim 20, comprising applying a skincare product or a traditional nourishing face mark to the face prior to applying the face mask.

23. A multifunctional temperature self-regulating three-dimensional face mask which has a facial concave-convex shape formed by joining two sheets together, the face portion of the three-dimensional face mask corresponding to the face from outside to inside comprising at least: a carrier layer loaded with functional materials and a thermal-insulation layer directly contacted with the skin; wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

24. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

25. The multifunctional temperature self-regulating three-dimensional face mask according to claim 24, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

26. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

27. The multifunctional temperature self-regulating three-dimensional face mask according to claim 26, wherein the flexible water-impermeable material is transparent.

28. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the sealed cavity is loaded with a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

29. The multifunctional temperature self-regulating three-dimensional face mask according to claim 28, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered, the film maintains a heating temperature at 40°C to 55°C, and the heating time lasts 5 to 30 minutes.

30. The multifunctional temperature self-regulating three-dimensional face mask according to claim 29, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, and the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

31. The multifunctional temperature self-regulating three-dimensional face mask according to claim 30, wherein the oversaturated aqueous solution of sodium acetate is added with a nucleating agent.

32. The multifunctional temperature self-regulating three-dimensional face mask according to claim 31, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate and sodium phosphate

dibasic dodecahydrate.

33. The multifunctional temperature self-regulating three-dimensional face mask according to claim 28, wherein at least one side of the carrier layer is provided with a fluid reservoir; wherein the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve, and the fluid reservoir is loaded with fluid; when the fluid reservoirs is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

34. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

35. The multifunctional temperature self-regulating three-dimensional face mask according to claim 34, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3°C to 20°C, and the cooling time lasts 5 to 30 minutes.

36. The multifunctional temperature self-regulating three-dimensional face mask according to claim 34, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride, ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

37. The multifunctional temperature self-regulating three-dimensional face mask according to claim 33 or 34, wherein a a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

38. The multifunctional temperature self-regulating three-dimensional face mask according to claim 33 or 34, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

39. The multifunctional temperature self-regulating three-dimensional face mask according to claim 33 or 34, the three-dimensional face mask is 2mm to15mm thick.

40. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the face mask to the skin.

41. The multifunctional temperature self-regulating three-dimensional face mask according to claim 40, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

42. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the three-dimensional face mask comprises a left side sheet and a right side sheet respectively matching the left area of the face and the right area of the face, front edge portions of the left side sheet and the right side sheet are provided with an adhesive material, the left side sheet and the right side sheet are thereby adhered together by the adhesive material along a median line of the face to form a facial concave-convex shape.

43. The multifunctional temperature self-regulating three-dimensional face mask according to claim 42, wherein either of the front edge portions of the left side sheet and the right side sheet has a protrusion projecting outwards from above down and matching the shape of the left area or right area of the external nose, a mouth portion which is a notch matching the mouth is provided below

the protrusion, a portion of the front edge portion below the notch has an arc shape with a certain radian and extends downwards to the bottom the face mask; except the notch matching the mouth, either of the front edge portions of the left side sheet and the right side sheet is provided with an adhesive material, and the left side sheet and the right side sheet are thereby adhered together by the adhesive material.

44. The multifunctional temperature self-regulating three-dimensional face mask according to claim 43, wherein a glabella portion of either of the front edge portions of the left side sheet and the right side sheet which faces a space between the user's eyebrows, just above the protrusion, is formed as an arc which is slightly concaved inwards.

45. The multifunctional temperature self-regulating three-dimensional face mask according to claim 43, wherein an eye-and-glabella portion of either of the front edge portions of the left side sheet and the right side sheet which faces the user's eyes and glabella, just above the protrusion, is formed as a notch which is concaved inwards; except the eye-and-glabella portion and the mouth portion, either of the front edge portions of the left side sheet and the right side sheet are provided with an adhesive material , and the left side sheet and the right side sheet are thereby adhered together by the adhesive material.

46. The multifunctional temperature self-regulating three-dimensional face mask according to any one of claims 42-45, there is a fixing strap provided on either of the rear edge portions of the left side sheet and the right side sheet, and there is a velcro provided at the end of the fixing strap.

47. A method of using the multifunctional temperature self-regulating three-dimensional face mask according to claim 46, comprising first applying a skincare product or a traditional nourishing face mark to the face prior to applying the three-dimensional face mask; or, pre-coating a skincare product on the surface of the thermal-insulation layer that is in contact with the skin, joining the left side sheet and the right side sheet together, then applying the joined three-dimensional face mask to the face.

48. A multifunctional temperature self-regulating face mask, the face portion of the face mask corresponding to the face from outside to inside comprising at least: a carrier layer loaded with functional materials and a thermal-insulation layer directly contacted with the skin; wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

49. The multifunctional temperature self-regulating face mask according to claim 48, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

50. The multifunctional temperature self-regulating face mask according to claim 49, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

51. The multifunctional temperature self-regulating face mask according to claim 48, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

52. The multifunctional temperature self-regulating face mask according to claim 52, wherein the flexible water-impermeable material is transparent.

53. The multifunctional temperature self-regulating face mask according to claim 48, wherein the sealed cavity is loaded with a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

54. The multifunctional temperature self-regulating face mask according to claim 53, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered,

the film maintains a heating temperature at 40°C to 55°C, and the heating time lasts 5 to 30 minutes.

55. The multifunctional temperature self-regulating face mask according to claim 54, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, and the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

56. The multifunctional temperature self-regulating face mask according to claim 55, wherein the oversaturated aqueous solution of sodium acetate is added with a nucleating agent.

57. The multifunctional temperature self-regulating face mask according to claim 56, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate and sodium phosphate dibasic dodecahydrate.

58. The multifunctional temperature self-regulating face mask according to claim 53, wherein at least one side of the carrier layer is provided with a fluid reservoir; wherein the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve, and the fluid reservoir is loaded with fluid; when the fluid reservoirs is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

59. The multifunctional temperature self-regulating face mask according to claim 48, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such

that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

60. The multifunctional temperature self-regulating face mask according to claim 59, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3°C to 20°C, and the cooling time lasts 5 to 30 minutes.

61. The multifunctional temperature self-regulating face mask according to claim 59, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride, ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

62. The multifunctional temperature self-regulating face mask according to claim 58 or 59, wherein a a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

63. The multifunctional temperature self-regulating face mask according to claim 58 or 59, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

64. The multifunctional temperature self-regulating face mask according to claim 58 or 59, the face mask is 2mm to 15mm thick.

65. The multifunctional temperature self-regulating face mask according to claim 48, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the film to the skin.

66. The multifunctional temperature self-regulating face mask according to claim 65, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

67. The multifunctional temperature self-regulating face mask according to claim 48, wherein the face mask has notches matching the user's nose and mouth, respectively.

68. The multifunctional temperature self-regulating face mask according to claim 67, wherein the face mask also has notches matching the user's eyes.

69. The multifunctional temperature self-regulating face mask according to claim 68, wherein there is a fixing strap provided on either side of the face mask, and there is a velcro provided at the end of the fixing strap.

70. A method of using the multifunctional temperature self-regulating face mask according to claim 69, comprising: applying a skincare product or a traditional nourishing face mark to the face prior to applying the multifunctional temperature self-regulating face mask; or, pre-coating a skincare product on the surface of the thermal-insulation layer that is in contact with the skin, then applying the pre-coated multifunctional temperature self-regulating face mask to the face.

71. A multifunctional temperature self-regulating eye mask, the eye portion of the eye mask corresponding to the eye from outside to inside comprising at least: a carrier layer loaded with functional materials and a thermal-insulation layer directly contacted with the skin; wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

72. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

73. The multifunctional temperature self-regulating eye mask according to claim 72, wherein

the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

74. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

75. The multifunctional temperature self-regulating eye mask according to claim 74, wherein the flexible water-impermeable material is transparent.

76. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the sealed cavity is loaded with a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

77. The multifunctional temperature self-regulating eye mask according to claim 76, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered, the film maintains a heating temperature at 40 to 55°C, and the heating time lasts 5 to30 minutes.

78. The multifunctional temperature self-regulating eye mask according to claim 77, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, and the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

79. The multifunctional temperature self-regulating eye mask according to claim 78, wherein the oversaturated aqueous solution of sodium acetate is added with nucleating agent.

80. The multifunctional temperature self-regulating eye mask according to claim 79, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium

sulfate, sodium silicate, sodium pyrophosphate and sodium phosphate dibasic dodecahydrate.

81. The multifunctional temperature self-regulating eye mask according to claim 76, wherein at least one side of the carrier layer is provided with a fluid reservoir; wherein the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve, and the fluid reservoir is loaded with fluid; when the fluid reservoirs is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

82. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

83. The multifunctional temperature self-regulating eye mask according to claim 82, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3 to 20°C, and the cooling time lasts 5 to 30 minutes.

84. The multifunctional temperature self-regulating eye mask according to claim 82, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride, ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

85. The multifunctional temperature self-regulating eye mask according to claim 81 or 82, wherein a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

86. The multifunctional temperature self-regulating eye mask according to claim 81 or 82, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

87. The multifunctional temperature self-regulating eye mask according to claim 81 or 82, the eye mask is 2mm to15mm thick.

88. The multifunctional temperature self-regulating eye mask according to claim 71, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the film to the skin.

89. The multifunctional temperature self-regulating eye mask according to claim 88, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

90. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the eye mask comprises hanging parts which have ears slits and can be hung on the user's ears.

91. The multifunctional temperature self-regulating eye mask according to claim 90, wherein a slit is vertically cut along a lower half of a central vertical axis of the eye mask.

[0157] Figure 28 shows a multifunctional temperature self-regulating eye mask according to Example 21 of the present invention. In this example, the functional material loaded in the carrier layer 531 is urea (120g). The fluid reservoir 535 is loaded with clean water (120g), and the fluid reservoir 535 and the carrier layer 531 are manufactured in one piece, and they are interconnected by the existing one-way valve 536. Just as Example 20, the two fluid reservoirs 535 are respectively arranged on the hanging parts 51. When a user wants a cold compress, he only needs to press the fluid reservoirs 535 with hand to make the clean water loaded in the fluid reservoir 535 flow to the carrier layer 531 and mix with urea, then the cooling effect would be achieved due to endothermic reaction.

Comparative Example 4

[0158] The eye mask in Comparative Example 4 is similar to that in Example 20 except that no thermal-insulation layer is provided, and it is used in the same way as described in Example 20.

[0159] The results show that the duration of the heat generation (in a heat range above 37°C) for the eye mask in Example 20 is about 35 minutes, while it is only about 20 minutes for the eye mask in Comparative Example 4; and the duration of the refrigeration for the eye mask in Example 20 is about 30 minutes, while it is only about 20 minutes for the eye mask in Comparative Example 4. In addition, it has been demonstrated in experiments that due to the thermal-insulation layer according to the invention the heat generation/refrigeration in Example 20 is significantly more homogeneous than that in Comparative Example 4, that is, the eye mask in Example 20 overcomes the problem of the eye mask in Comparative Example 4 which is either too hot or too cold for most of the time it is being used. Compared with Comparative Example 4, the eye mask in Example 20 improves the absorption effect of the skincare and the moisture content of the skin.

WHAT IS CLAIMED IS:

1. A multifunctional temperature self-regulating film, from outside to inside comprising at least:

a carrier layer loaded with functional materials, and

a thermal-insulation layer directly contacted with the skin;

wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

2. The multifunctional temperature self-regulating film according to claim 1, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

3. The multifunctional temperature self-regulating film according to claim 2, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

4. The multifunctional temperature self-regulating film according to claim 1, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

5. The multifunctional temperature self-regulating film according to claim 4, wherein the flexible water-impermeable material is transparent.

6. The multifunctional temperature self-regulating film according to claim 1, wherein the sealed cavity is loaded with

a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the

solid-liquid phase change material.

7. The multifunctional temperature self-regulating film according to claim 6, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered, the film maintains a heating temperature at 40°C to 55°C, and the heating time lasts 5 to 30 minutes.

8. The multifunctional temperature self-regulating film according to claim 7, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

9. The multifunctional temperature self-regulating film according to claim 8, wherein the oversaturated aqueous solution of sodium acetate is added with a nucleating agent.

10. The multifunctional temperature self-regulating film according to claim 9, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate, and sodium phosphate dibasic dodecahydrate.

11. The multifunctional temperature self-regulating film according to claim 6, wherein at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

12. The multifunctional temperature self-regulating film according to claim 1, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are

interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

13. The multifunctional temperature self-regulating film according to claim 12, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3°C to 20°C, and the cooling time lasts 5 to 30 minutes.

14. The multifunctional temperature self-regulating film according to claim 12, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride and ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

15. The multifunctional temperature self-regulating film according to claim 11 or 12, wherein a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

16. The multifunctional temperature self-regulating film according to claim 11 or 12, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

17. The multifunctional temperature self-regulating film according to any one of claims 1 to 14, wherein the film is ergonomically designed in shape to be applied to various body parts.

18. The multifunctional temperature self-regulating film according to claim 17, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the film to the skin.

19. The multifunctional temperature self-regulating film according to claim 18, wherein there

is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

20. The multifunctional temperature self-regulating film according to claim 11 or 12, wherein the multifunctional temperature self-regulating film is made into a face mask applied to the face, both two sides of the carrier layer loaded with functional materials are provided with a fluid reservoir which is made into a long and narrow strip, and either of the fluid reservoirs is provided with a fixture to attach the face mask to the user's head.

21. The multifunctional temperature self-regulating film according to claim 20, wherein the face mask is 2 mm to 15 mm thick.

22. A method of using the multifunctional temperature self-regulating film according to claim 20, comprising applying a skincare product or a traditional nourishing face mark to the face prior to applying the face mask.

23. A multifunctional temperature self-regulating three-dimensional face mask which has a facial concave-convex shape formed by joining two sheets together, the face portion of the three-dimensional face mask corresponding to the face from outside to inside comprising at least: a carrier layer loaded with functional materials and a thermal-insulation layer directly contacted with the skin; wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

24. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

25. The multifunctional temperature self-regulating three-dimensional face mask according to

claim 24, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

26. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

27. The multifunctional temperature self-regulating three-dimensional face mask according to claim 26, wherein the flexible water-impermeable material is transparent.

28. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the sealed cavity is loaded with a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

29. The multifunctional temperature self-regulating three-dimensional face mask according to claim 28, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered, the film maintains a heating temperature at 40°C to 55°C, and the heating time lasts 5 to 30 minutes.

30. The multifunctional temperature self-regulating three-dimensional face mask according to claim 29, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, and the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

31. The multifunctional temperature self-regulating three-dimensional face mask according to claim 30, wherein the oversaturated aqueous solution of sodium acetate is added with a nucleating agent.

32. The multifunctional temperature self-regulating three-dimensional face mask according to claim 31, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate and sodium phosphate dibasic dodecahydrate.

33. The multifunctional temperature self-regulating three-dimensional face mask according to claim 28, wherein at least one side of the carrier layer is provided with a fluid reservoir; wherein the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve, and the fluid reservoir is loaded with fluid; when the fluid reservoirs is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

34. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

35. The multifunctional temperature self-regulating three-dimensional face mask according to claim 34, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3°C to 20°C, and the cooling time lasts 5 to 30 minutes.

36. The multifunctional temperature self-regulating three-dimensional face mask according to claim 34, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride, ammonium nitrate, and the fluid loaded in the fluid

reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

37. The multifunctional temperature self-regulating three-dimensional face mask according to claim 33 or 34, wherein a a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

38. The multifunctional temperature self-regulating three-dimensional face mask according to claim 33 or 34, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

39. The multifunctional temperature self-regulating three-dimensional face mask according to claim 33 or 34, the three-dimensional face mask is 2mm to15mm thick.

40. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the face mask to the skin.

41. The multifunctional temperature self-regulating three-dimensional face mask according to claim 40, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

42. The multifunctional temperature self-regulating three-dimensional face mask according to claim 23, wherein the three-dimensional face mask comprises a left side sheet and a right side sheet respectively matching the left area of the face and the right area of the face, front edge portions of the left side sheet and the right side sheet are provided with an adhesive material, the left side sheet and the right side sheet are thereby adhered together by the adhesive material along a median line of the face to form a facial concave-convex shape.

43. The multifunctional temperature self-regulating three-dimensional face mask according to

claim 42, wherein either of the front edge portions of the left side sheet and the right side sheet has a protrusion projecting outwards from above down and matching the shape of the left area or right area of the external nose, a mouth portion which is a notch matching the mouth is provided below the protrusion, a portion of the front edge portion below the notch has an arc shape with a certain radian and extends downwards to the bottom the face mask; except the notch matching the mouth, either of the front edge portions of the left side sheet and the right side sheet is provided with an adhesive material, and the left side sheet and the right side sheet are thereby adhered together by the adhesive material.

44. The multifunctional temperature self-regulating three-dimensional face mask according to claim 43, wherein a glabella portion of either of the front edge portions of the left side sheet and the right side sheet which faces a space between the user's eyebrows, just above the protrusion, is formed as an arc which is slightly concaved inwards.

45. The multifunctional temperature self-regulating three-dimensional face mask according to claim 43, wherein an eye-and-glabella portion of either of the front edge portions of the left side sheet and the right side sheet which faces the user's eyes and glabella, just above the protrusion, is formed as a notch which is concaved inwards; except the eye-and-glabella portion and the mouth portion, either of the front edge portions of the left side sheet and the right side sheet are provided with an adhesive material , and the left side sheet and the right side sheet are thereby adhered together by the adhesive material.

46. The multifunctional temperature self-regulating three-dimensional face mask according to any one of claims 42-45, there is a fixing strap provided on either of the rear edge portions of the left side sheet and the right side sheet, and there is a velcro provided at the end of the fixing strap.

47. A method of using the multifunctional temperature self-regulating three-dimensional face mask according to claim 46, comprising first applying a skincare product or a traditional nourishing face mark to the face prior to applying the three-dimensional face mask; or, pre-coating a skincare product on the surface of the thermal-insulation layer that is in contact with the skin, joining the left

side sheet and the right side sheet together, then applying the joined three-dimensional face mask to the face.

48. A multifunctional temperature self-regulating face mask, the face portion of the face mask corresponding to the face from outside to inside comprising at least: a carrier layer loaded with functional materials and a thermal-insulation layer directly contacted with the skin; wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

49. The multifunctional temperature self-regulating face mask according to claim 48, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene terephthalate film and metal.

50. The multifunctional temperature self-regulating face mask according to claim 49, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

51. The multifunctional temperature self-regulating face mask according to claim 48, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

52. The multifunctional temperature self-regulating face mask according to claim 52, wherein the flexible water-impermeable material is transparent.

53. The multifunctional temperature self-regulating face mask according to claim 48, wherein the sealed cavity is loaded with a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

54. The multifunctional temperature self-regulating face mask according to claim 53, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered, the film maintains a heating temperature at 40°C to 55°C, and the heating time lasts 5 to 30 minutes.

55. The multifunctional temperature self-regulating face mask according to claim 54, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, and the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

56. The multifunctional temperature self-regulating face mask according to claim 55, wherein the oversaturated aqueous solution of sodium acetate is added with a nucleating agent.

57. The multifunctional temperature self-regulating face mask according to claim 56, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate and sodium phosphate dibasic dodecahydrate.

58. The multifunctional temperature self-regulating face mask according to claim 53, wherein at least one side of the carrier layer is provided with a fluid reservoir; wherein the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve, and the fluid reservoir is loaded with fluid; when the fluid reservoirs is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

59. The multifunctional temperature self-regulating face mask according to claim 48, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are

interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

60. The multifunctional temperature self-regulating face mask according to claim 59, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3°C to 20°C, and the cooling time lasts 5 to 30 minutes.

61. The multifunctional temperature self-regulating face mask according to claim 59, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride, ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

62. The multifunctional temperature self-regulating face mask according to claim 58 or 59, wherein a a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

63. The multifunctional temperature self-regulating face mask according to claim 58 or 59, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

64. The multifunctional temperature self-regulating face mask according to claim 58 or 59, the face mask is 2mm to 15mm thick.

65. The multifunctional temperature self-regulating face mask according to claim 48, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the film to the skin.

66. The multifunctional temperature self-regulating face mask according to claim 65, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

67. The multifunctional temperature self-regulating face mask according to claim 48, wherein the face mask has notches matching the user's nose and mouth, respectively.

68. The multifunctional temperature self-regulating face mask according to claim 67, wherein the face mask also has notches matching the user's eyes.

69. The multifunctional temperature self-regulating face mask according to claim 68, wherein there is a fixing strap provided on either side of the face mask, and there is a velcro provided at the end of the fixing strap.

70. A method of using the multifunctional temperature self-regulating face mask according to claim 69, comprising: applying a skincare product or a traditional nourishing face mark to the face prior to applying the multifunctional temperature self-regulating face mask; or, pre-coating a skincare product on the surface of the thermal-insulation layer that is in contact with the skin, then applying the pre-coated multifunctional temperature self-regulating face mask to the face.

71. A multifunctional temperature self-regulating eye mask, the eye portion of the eye mask corresponding to the eye from outside to inside comprising at least: a carrier layer loaded with functional materials and a thermal-insulation layer directly contacted with the skin; wherein the carrier layer loaded with functional materials has a sealed cavity sealed with a flexible water-impermeable material, the sealed cavity is at least loaded with a refrigerating or heat-generating chemical material; wherein the thermal-insulation layer is made of a material having waterproof and thermal-insulation properties.

72. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the thermal-insulation layer is a metallized polyethylene terephthalate film made of polyethylene

terephthalate film and metal.

73. The multifunctional temperature self-regulating eye mask according to claim 72, wherein the metal used for the metallized polyethylene terephthalate film is aluminum, nickel, chromium or a mixture thereof.

74. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the flexible water-impermeable material is made of plastics, synthetic rubbers, synthetic fibers, waterproof fabrics or waterproof papers.

75. The multifunctional temperature self-regulating eye mask according to claim 74, wherein the flexible water-impermeable material is transparent.

76. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the sealed cavity is loaded with a solid-liquid phase change material which generates heat when the material changes from liquid to solid, and an actuating means which is used to trigger an exothermic state of the solid-liquid phase change material.

77. The multifunctional temperature self-regulating eye mask according to claim 76, after the liquid-to-solid phase change process of the solid-liquid phase change material has been triggered, the film maintains a heating temperature at 40 to 55°C, and the heating time lasts 5 to30 minutes.

78. The multifunctional temperature self-regulating eye mask according to claim 77, wherein the solid-liquid phase change material is an oversaturated aqueous solution of sodium acetate, and the actuating means is a flexible metal disc which takes a shape of an arc and has a plurality of corrugations on its surface, and the flexible metal disc is located in the oversaturated aqueous solution of sodium acetate.

79. The multifunctional temperature self-regulating eye mask according to claim 78, wherein the oversaturated aqueous solution of sodium acetate is added with nucleating agent.

80. The multifunctional temperature self-regulating eye mask according to claim 79, wherein the nucleating agent is selected from one or more of the group consisting of sodium borate, sodium sulfate, sodium silicate, sodium pyrophosphate and sodium phosphate dibasic dodecahydrate.

81. The multifunctional temperature self-regulating eye mask according to claim 76, wherein at least one side of the carrier layer is provided with a fluid reservoir; wherein the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve, and the fluid reservoir is loaded with fluid; when the fluid reservoirs is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to adjust the temperature of the carrier layer.

82. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the sealed cavity is loaded with a solid refrigerating chemical material which absorbs heat when the material changes from solid to liquid; at least one side of the carrier layer is provided with a fluid reservoir; the fluid reservoir and the carrier layer are manufactured in one piece, and they are interconnected by an existing one-way valve; the fluid reservoir is loaded with fluid, when the fluid reservoir is pressed by an external force, the fluid loaded in the fluid reservoir is injected into the carrier layer through the one-way valve to dissolve the solid refrigerating chemical material, such that the solid refrigerating chemical material changes from solid to liquid to absorb heat and lower the temperature of the film.

83. The multifunctional temperature self-regulating eye mask according to claim 82, after the solid-to-liquid phase change process of the solid refrigerating chemical material has been triggered, the film maintains a cooling temperature at -3 to 20°C, and the cooling time lasts 5 to 30 minutes.

84. The multifunctional temperature self-regulating eye mask according to claim 82, wherein the solid refrigerating chemical material is selected from one or more of the group consisting of urea, ammonium chloride, ammonium nitrate, and the fluid loaded in the fluid reservoir is clean water; wherein the weight ratio of the solid refrigerating chemical material to the clean water is 1:1.

85. The multifunctional temperature self-regulating eye mask according to claim 81 or 82, wherein a suitable amount of thickener is added in the fluid loaded in the fluid reservoir.

86. The multifunctional temperature self-regulating eye mask according to claim 81 or 82, wherein the sealed cavity and/or the fluid reservoir is further loaded with a pigment.

87. The multifunctional temperature self-regulating eye mask according to claim 81 or 82, the eye mask is 2mm to15mm thick.

88. The multifunctional temperature self-regulating eye mask according to claim 71, wherein there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, the layer of soluble hydrogel being used for adhering the film to the skin.

89. The multifunctional temperature self-regulating eye mask according to claim 88, wherein there is provided an active ingredient of a topically-applied healthcare product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

90. The multifunctional temperature self-regulating eye mask according to claim 71, wherein the eye mask comprises hanging parts which have ears slits and can be hung on the user's ears.

91. The multifunctional temperature self-regulating eye mask according to claim 90, wherein a slit is vertically cut along a lower half of a central vertical axis of the eye mask.