three-dimensional face mask completely adhering to every facial curve, so as to overcome the deficiencies of the traditional face mask, which is built from a single mask sheet and is liable to wrinkle and slack, thereby the traditional one-piece face mask cannot be uniformly and reliably applied to the face and affects the cosmetic and cleaning effect.

[0118] As shown in Figure 5, either of the front edge portion 111 of the left side sheet 11 and the front edge portion 121 of the right side sheet 12 is provided with a protrusion 112,122 projecting outwards from above down and matching the shape of the left area or right area of the external nose. A notch 113,123 corresponding to the mouth is respectively provided below the protrusion112, 122. After the two sheets are joined together, the notch 113, 123 are joined and form a mouth portion matching the mouth. There is no adhesive material provided on the notch 113, 123 of the front edge portion 111,121. The portion of the front edge portion below the notch 113,123 respectively has an arc shape 114,124 with a certain radian and extends downwards to the bottom the face mask. Since either of the front edge portion 111 of the left side sheet 11 and front edge portion 121 of the right side sheet 12 has a protrusion projecting outwards from above down and matching the shape of the left area or right area of the external nose, after the left side sheet 11 and the right side sheet 12 are joined together, the three-dimensional face mask would naturally have a nose-like protrusion from above down on the user's nose, so as to reliably fit the nose. Since the portion of the front edge portion 111, 121 below the notch 113, 123 respectively has an arc shape with a certain radian and extends downwards to the bottom the face mask, after the left side sheet 11 and the right side sheet 12 are joined together, the lower half of the face mask has a curved surface which can reliably fit the jaw, so as to improve the adherence to the face.

[0119] Figure 7 shows the concave-convex shape of the three dimensional face mask which has been applied to the user's face. A nose-like protrusion is formed after the protrusion112, 122 are joined together, and an elliptical notch corresponding to the mouth is formed after the notch 113, 123 are joined together, and a curved surface is formed after the arc shape 114,124 are joined together, so as to fit the lower face and jaw. It can be seen that compared with the traditional sheet-mask, the present three-dimensional face mask fits the user's face which has a concave-convex shape better, so that it can be uniformly applied to the entire face and uniformly clean and nourish the face skin.

[0120] Preferably, a notch 115,125 which is concaved inwards is provided on the

eye-and-glabella portion of either of the front edge portion 111 , 121 of the left side sheet 11 and the right side sheet 12 which faces the user's eyes and glabella, just above the protrusion 112, 122. The notch 114, 124 can be almost semielliptical or semicircular, as long as the eyes are uncovered but the skin around the eyes is almost covered. On either of the front edge portions 111,121 of the left side sheet 11 and the right side sheet 12, neither the notch 113, 123 corresponding to the mouth nor the notch 115,125 corresponding to the eye-and-glabella is provided with adhesive material. That is, the left side sheet and the right side sheet are provided with an adhesive material on either of the front edge portions, except the notch 113, 123 corresponding to the mouth and the notch 115,125 corresponding to the eye-and-glabella, and the left side sheet and the right side sheet are thereby adhered together by the adhesive material.

[0121] Preferably, as shown in Figure 5, the rear edge portions of the left side sheet 11 and the right side sheet 12 are respectively provided with a fixing strap 118, 128, and preferably, the fixing strap 118, 128 are respectively provided with a velcro 119, 129. After applied to the face, the three-dimensional face mask can be attached to the user's head by the fixing strap and tighten by the velcro. The velcro, also known as hook-and-loop or hook-and-pile, is a common fastener used on the clothes, which is consisted of two components, typically, the first component features tiny hooks; the second features even smaller and "hairier" loops.

[0122] In this example, as shown in Figure 5, either of the face portions 116, 126 of the left side sheet 11 and the right side sheet 12 of the three-dimensional face mask 10 comprises a structure of at least three layers. Figure 8 shows the section view of the structure of three layers, which from outside to inside are respectively: an outer layer 131 formed of air permeable material; a heat-generating layer 132 loaded with heat-generating composition 1321 that generates heat on contact with air, at least an upper sealing surface of the heat-generating layer that is in contact with the outer layer being formed of an air permeable material; and an thermal-insulation layer 133 formed of a material having waterproof and thermal-insulation properties. The heat-generating composition 1321 in powder or granule form is loaded in heat-generating layer 132, and the thermal-insulation layer 133 is in contact with the skin 14.

[0123] In this example, the above three layers of the three-dimensional face mask are adhered together by, for example, using the adhesive or thermal bonding, which are applied to the skin as a whole. In some cases, the thermal-insulation layer is not adhered together with the outer layer

side sheet 11 and the front edge portion 221 of the right side sheet 12. In this example, either of the glabella portions of the front edge portions 211, 221 of the left side sheet 11 and the right side sheet 12 which faces a space between the user's eyebrows, just above the protrusion 212, 222, is formed as an arc 215, 225 which is slightly concaved inwards. The arc 215, 225 is provided with an adhesive material. Due to the arc 215, 225, after the left side sheet 11 and the right side sheet 12 are joined together, the three-dimensional face mask would have a slight concave on the arc 215, 225, such that the three-dimensional face mask reliably fits the concave on the user's glabella-and-nasion portion, just as shown in Figure 11.

[0133] The three-dimensional face mask in this example only has a notch on the portion corresponding to the mouth (including the portion below the nostril), other areas are inclosed, so it can clean and rejuvenate most areas of the face. In addition, the heat-generating layer and thermal-insulation layer of the three-dimensional face mask can warm and nourish the user's eyes, and thus preventing dry eye syndrome.

Example 6

[0134] In this example, there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer that is in contact with the skin, so as to adhere the three-dimensional face mask to the user's face. Soluble hydrogel can be used as a body adhesive to adhere the film to the body.

[0135] In soluble hydrogel, water is the dispersion medium. When soluble hydrogel is adhered to the skin, it turns from a solid to a liquid state due to body temperature, and permeates into the skin. Therefore, preferably, there is provided some active ingredients in the hydrogel matrix, such as, collagen, hyaluronic acid, arbutin, niacinamide, aromatic essential oil, or other health care products, topically-applied medicine etc. Since the present self-heating thermal-insulation film comprises an additional thermal-insulation layer formed of a material having waterproof and thermal-insulation properties, the water in the hydrogel can't permeate into the heat-generating layer, so as to avoid affecting peak heating temperature and heating effect. Furthermore, hydrogel is helpful to prevent heat from quickly spreading out from the skin.

Example 6

usually makes the user give up using the mask, so the skin is not nursed when the nutrient is needed the most. The present three-dimensional face mask has overcome the above shortcomings of the existing mask and has expanded the functionality of the existing mask.

[0139] Furthermore, the present three-dimensional face mask is low cost and disposable, it is safe and hygienic when in contact with face skin or other susceptible body parts, and avoids the need for disinfecting the physical heating apparatus which is reused and in direct contract with the skin and potential health risk caused by irregular disinfection. The used face mask will not cause toxin pollution, and the heat-generating composition can be recycled and used as materials improving the quality of the earth.

Example 8

[0140] As shown in Figure 12, in example 8, the face mask 10 has notches 201 corresponding to the user's eyes, and notch 202 corresponding to the mouth, and notch 13 corresponding to the nostril. The two sides of the face mask 10 are provided with a fixing strap 14, and the fixing strap 14 is provided with a velcro 15.

[0141] After applied to the face, the face mask 10 can be attached to the user's head by the fixing strap 14 and tighten by the velcro 15.

[0142] In this example, as shown in Figure 12, the face portion 16 of the face mask 10 comprises a structure of at least three layers. Figure 13 shows the section view of the structure of three layers, which from outside to inside are respectively: an outer layer 161 formed of air permeable material; a heat-generating layer 162 loaded with heat-generating composition 1621 that generates heat on contact with air, at least an upper sealing surface of the heat-generating layer that is in contact with the outer layer being formed of an air permeable material; and an thermal-insulation layer 163 formed of a material having waterproof and thermal-insulation properties. The heat-generating composition 1621 in powder or granule form is loaded in heat-generating layer 162, and the thermal-insulation layer 163 is in contact with the skin 17.

[0143] In this example, the above three layers of the face mask 10 are adhered together by, for example, using the adhesive or thermal bonding, which are applied to the skin as a whole. In some cases, the thermal-insulation layer is not adhered together with the outer layer and heat-generating layer. That is, in use, the thermal-insulation layer is first applied to the skin, then the

cause toxin pollution, and the heat-generating composition can be recycled and used as materials improving the quality of the earth.

Example 12

[0158] As shown in Figure 15, in example 12, the eye portion 316 of the eye mask 30 comprises a structure of at least three layers. Figure 16 shows the section view of the structure of three layers, which from outside to inside are respectively: an outer layer 161 formed of air permeable material; a heat-generating layer 162 loaded with heat-generating composition 1621 that generates heat on contact with air, at least an upper sealing surface of the heat-generating layer that is in contact with the outer layer being formed of an air permeable material; and an thermal-insulation layer 163 formed of a material having waterproof and thermal-insulation properties. The heat-generating composition 1621 in powder or granule form is loaded in heat-generating layer 162, and the thermal-insulation layer 163 is in contact with the skin 17.

[0159] In this example, the above three layers of the eye mask 30 are adhered together by, for example, using the adhesive or thermal bonding, which are applied to the skin as a whole. In some cases, the thermal-insulation layer is not adhered together with the outer layer and heat-generating layer. That is, in use, the thermal-insulation layer is first applied to the skin, then the outer layer and heat-generating layer are applied, and the similar self-heating thermal-insulation effect can also be obtained.

[0160] The eye mask is mainly used for eye care, such as moisturizing, eliminating fatigue, relieving swelling and black eyes, and anti-aging. In this example, the eye portion of the eye mask comprises a structure of three layers, the heat given off from the heat-generating layer can relax the muscle around the eyes, enlarge blood vessel and accelerate blood circulation, so as to relieve swelling, dry eye syndrome and eye irritation. In addition, a thermal-insulation layer formed of a material having waterproof and thermal-insulation properties is provided between the heat-generating layer and skin. When used, the thermal-insulation layer ensures the heat given off from the heat-generating layer is evenly and stably transferred to the skin, and the heat will not spread out quickly from the skin, so as to avoid scalding caused by too high initial temperature and maintain stable and suitable holding temperature. Further, the thermal-insulation layer prevents the water or oil in the skincare product, topically-applied medicine or healthcare product or

[0164] In this example, the griddings 1622 are formed by thermal bonding of the upper sealing surface of heat-generating layer 162 in contact with the outer layer 161 and the lower sealing surface of heat-generating layer 162 in contact with the thermal-insulation layer 163. The griddings 1622 and the upper/lower sealing surface of heat-generating layer 162 are directly molded in one. In production, the bonding mold of thermal-insulation layer is provided with gridding patterns. After heating, the upper/lower sealing surface will be bonded together on the bulge of the bolding mold. Of course, the griddings can be formed by any other known method in the prior art.

[0165] In this example, the self-heating thermal-insulation eye mask is loaded in a sealed package before using, so as to prevent the heat-generating composition in heat-generating layer from being oxidized by oxygen and water in the air before using. The sealed package can be made from any air impermeable material, such as plastic film.

[0166] In this example, the heat-generating composition comprises (by weigh): 50 parts medical iron powder; 15 parts active carbon; 5 parts metal salt; 3 parts vermiculite; 1 part water-absorbent resin; 5 parts water; and 1 part diatomite.

[0167] In this example, the thickness of the eye mask depends upon the heat-generating layer, since both the outer layer and thermal-insulation layer are made of films very thin. In order to maintain heating temperature of 38-55°Cand heating time of 10-25 minutes, the mask is 2-8mm thick, that is, the total heat-generating composition loaded in the heat-generating layer is 2-8mm thick. Within the thickness range, the mask fits tightly to the face.

[0168] In this example, a slit 315 is vertically cut along a lower half of a central vertical axis of the eye mask. Due to this, after applied to the eyes, a left side piece and a right side piece of the eye mask can naturally splay outward on the portion of nose bridge, so as to fit the user's eyes in shape, that is, the left side piece and the right side piece of the eye mask are symmetrically arranged along the nose bridge and naturally splay outward to the two sides of the slit so as to be reliably adhered to the eyes.

Example 13

[0169] Figure 17 shows another example of the present eye mask. The difference of example 13 over example 12 is that besides the structure of three layers on the eyes portions, the eye mask 30 is

also provided with two hanging parts 321. The hanging parts 321 are adhered to the main body of the eye mask, and drawing reference 23 represents the adhering site. The hanging parts 321 have ears slits 322 which can hung on the user's ears. In use, the eye mask can be reliably attached to the user's eyes by the hanging parts 321, so the eye mask would not easily move or fall off from the eyes.

Example 14

[0170] In this example, there is provided a layer of water-soluble hydrogel on the surface of the thermal-insulation layer of the eye mask that is in contact with the skin.

Example 15

[0171] Example 15 differs from example 12 only in the heat-generating composition, which comprises (by weigh): 30 parts medical iron powder; 10 parts active carbon; 1 pars metal salt; 13 parts vermiculite; 5 parts water-absorbent resin; 1 part water; and 5 parts diatomite.

Technical advantage of Examples 12-15

[0172] In order to test the skincare and cosmetic effect of the eye mask, 50 testees were recruited. All testees first applied a commercial available traditional eye mask of some brand, then applied the eye mask in example 15 on their left eye or right eye and held the eye mask for 15 minutes. After removing the traditional eye mask and the present eye mask, the testees were asked and observed how well the eye mask worked. As a result, these testees wildly believed that the eye applied with the present eye mask was more comfortable, and the eye fatigue could be eased to some extent.

[0173] The present self-heating thermal-insulation eye mask is structurally simple, is not constrained by environmental resources, does not require energy supply from an external energy source, is safe and stable, uniformly generates heat, and can effectively prolong heating time and reduce peak heating temperature. The heat given off by the heat-generating layer and maintained by the thermal-insulation layer makes the skin comfortable, improves blood circulation and enlarges facial pores, so as to clean skin dirt and sebaceous secretion. When used in combination with a traditional nourishing eye mask or skincare product, the absorption of the effective ingredients in said traditional eye mask or skincare product is improved, so the amount of skincare product used is

WHAT IS CLAIMED IS:

1. A self-heating thermal-insulation film, comprising a structure of at least three layers, which, from outside to inside, are respectively:

an outer layer formed of an air permeable material;

a heat-generating layer loaded with heat-generating composition that generates heat on contact with air, at least an upper sealing surface of the heat-generating layer that is in contact with the outer layer being formed of an air permeable material; and

an thermal-insulation layer formed of a material having waterproof and thermal-insulation properties; wherein the thermal-insulation layer is a metal plating film made of metal and polyethylene terephthalate, oriented polypropylene, nylon, polyethylene or cast polypropylene film.

2. The self-heating thermal-insulation 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 self-heating thermal-insulation 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 self-heating thermal-insulation film according to claim 1, wherein the thermal-insulation layer is provided with griddings, and the heat-generating composition is evenly distributed in the griddings.

5. The self-heating thermal-insulation film according to claim 4, wherein the griddings are formed by thermal bonding of the upper sealing surface of the heat-generating layer in contact with the outer layer and a lower sealing surface of heat-generating layer in contact with the thermal-insulation layer.

6. The self-heating thermal-insulation film according to claim 1, wherein the outer layer is made of nonwoven or woven fabric of natural or synthetic fiber.

7. The self-heating thermal-insulation film according to claim 1, wherein the self-heating thermal-insulation film is loaded in a sealed package before using.

8. The self-heating thermal-insulation film according to claim 1, wherein the heat-generating composition in the heat-generating layer comprises an oxidizable metal, active carbon, an inorganic metal salt, water, a polymer moisturizer, and an absorbent.

9. The self-heating thermal-insulation film according to any of the preceding claims, wherein the film is ergonomically designed in shape to be applied to various body parts.

10. The self-heating thermal-insulation film according to claim 9, 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.

11. The self-heating thermal-insulation film according to claim 10, wherein there is provided an active ingredient of a topically-applied health care product, a topically-applied medicine or a skincare product in the layer of water-soluble hydrogel.

12. The self-heating thermal-insulation film according to claim 9, wherein the heat-generating layer of the film maintains a heating temperature at 38℃ to 55℃, and the heating time lasts 10 to 25 minutes.

13. The self-heating thermal-insulation film according to claim 12, wherein the heat-generating composition in the heat-generating layer comprises 30 to 50 parts by weight medical iron powder, 10 to 15 parts by weight active carbon, 1 to 5 parts by weight a metal salt, 3 to 13 parts by weight vermiculite, 1 to 5 parts by weight a water-absorbent resin, and 1to 5 parts by weight water.

14. The self-heating thermal-insulation film according to claim 12, wherein the heat-generating composition in the heat-generating layer comprises 30 to 50 parts by weight medical iron powder, 10 to 15 parts by weight active carbon, 1 to 5 parts by weight a metal salt, 3 to 13 parts by weight vermiculite, 1 to 5 parts by weight a water-absorbent resin, 1 to 5 parts by weight water, and 1 to 5 parts by weight diatomite.

15. The self-heating thermal-insulation film according to claim 13, wherein the film is 2-8mm thick.

16. A method of using the self-heating thermal-insulation film according to claim 9, wherein the film is used in combination with a topically-applied medicine, a health care product, a skincare product or a traditional nourishing face mask.

17. A self-heating thermal-insulation three-dimensional face mask which has a facial concave-convex shape formed by joining two sheets together, wherein the face portion of the three-dimensional face mask is made of the self-heating thermal-insulation film according to claim 9.

18. The self-heating thermal-insulation three-dimensional face mask according to claim 17, 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.

19. The self-heating thermal-insulation three-dimensional face mask according to claim 18, 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.

20. The self-heating thermal-insulation three-dimensional face mask according to claim 19, 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.

21. The self-heating thermal-insulation three-dimensional face mask according to claim 19, 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.

22. The self-heating thermal-insulation three-dimensional face mask according to claim 18, 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.

23. A method of using the self-heating thermal-insulation three-dimensional face mask according to claim 18, wherein the three-dimensional face mask is used in combination with a topically-applied medicine, a health care product, a skincare product or a traditional nourishing face mask.

24. A self-heating thermal-insulation face mask, wherein the face portion of the face mask is made of the self-heating thermal-insulation film according to claim 9.

25. The self-heating thermal-insulation face mask according to claim 24, wherein the face mask has notches matching the user's nose and mouth, respectively.

26. The self-heating thermal-insulation face mask according to claim 25, wherein the face mask also has notches matching the user's eyes.

27. The self-heating thermal-insulation face mask according to claim 26, 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.

28. A method of using the self-heating thermal-insulation face mask according to claim 24, wherein the face mask is used in combination with a topically-applied medicine, a healthcare product, a skincare product or a traditional nourishing face mask.

29. A self-heating thermal-insulation eye mask, wherein the eye portion of the

eye mask is made of the self-heating thermal-insulation film according to claim 9.

30. The self-heating thermal-insulation eye mask according to claim 29, wherein the eye mask comprises hanging parts which have ears slits and can hang on the user's ears.

31. The self-heating thermal-insulation eye mask according to claim 30, wherein a slit is vertically cut along a lower half of a central vertical axis of the eye mask.