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(54) **WARMING DEVICE**

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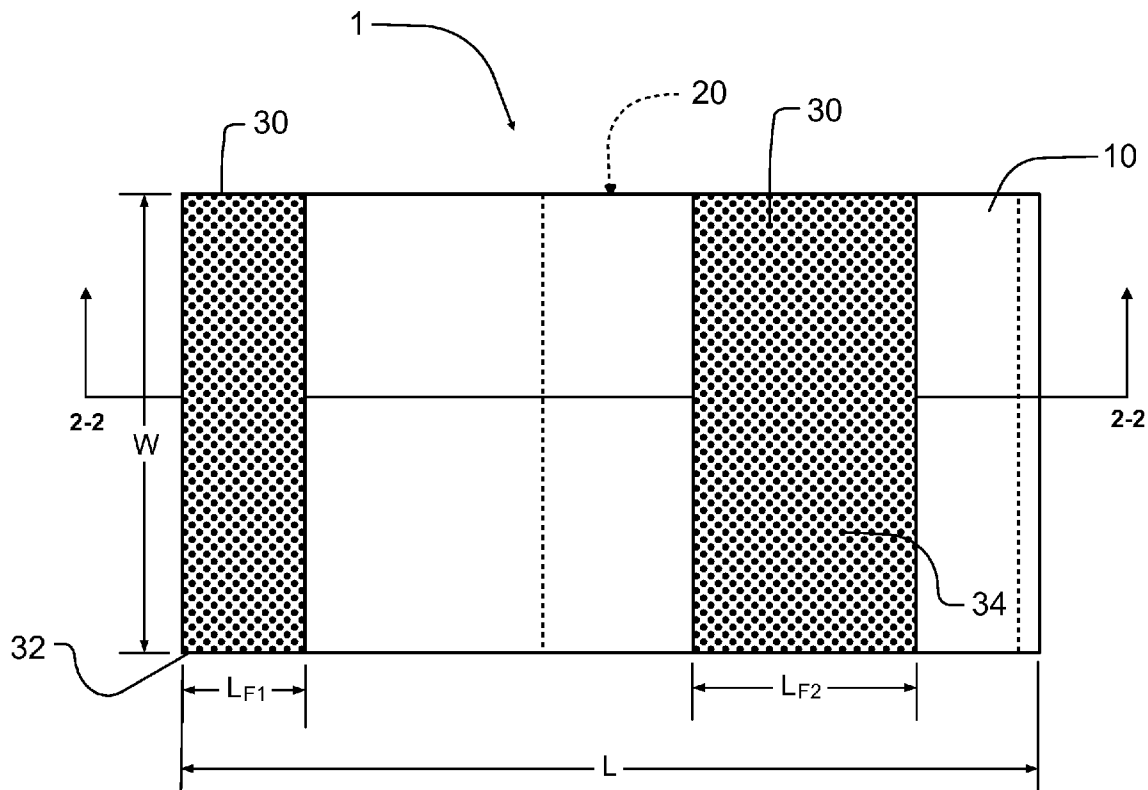
(57) **ABSTRACT**

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Related U.S. Application Data

(60) Provisional application No. 61/467,802, filed on Mar. 25, 2011.

A warming device for directing energy from a heating pad. The warming device includes a sleeve of insulating material, a heat pad receiving pocket, and a reflective material positioned inside the pocket. The heating pad receiving pocket is disposed along a first surface side of the sleeve, while the reflective material positioned inside of the heating pad receiving pocket along the first surface side of the sleeve.



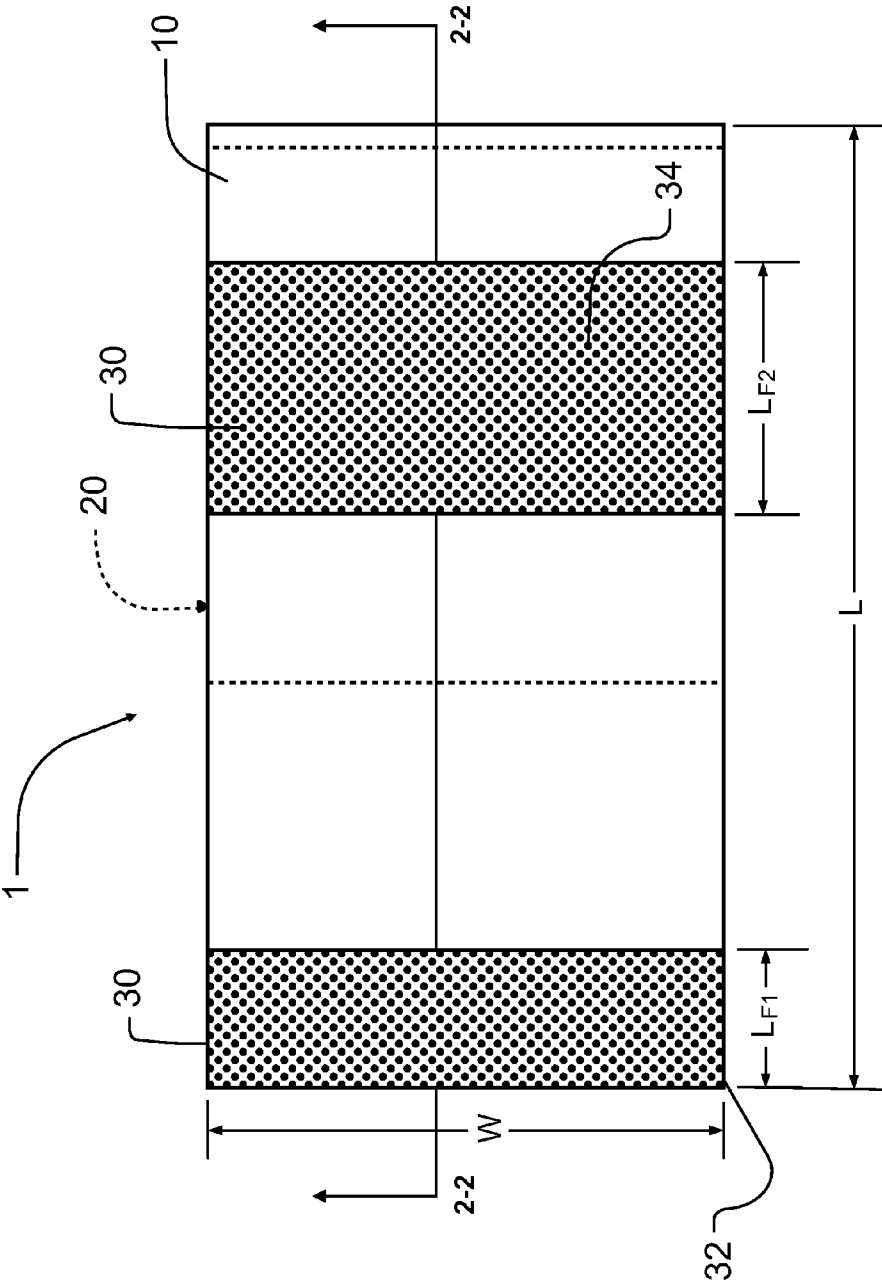


FIG. 1

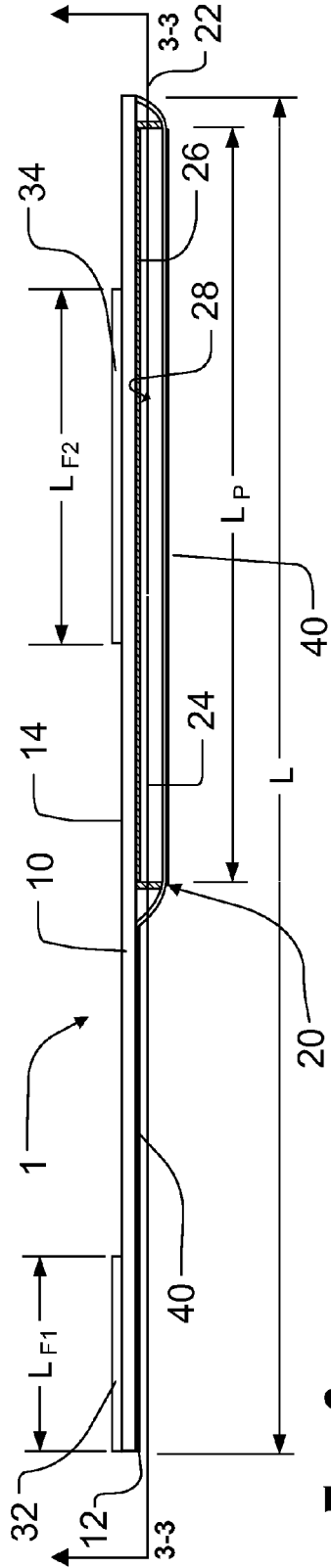


FIG. 2

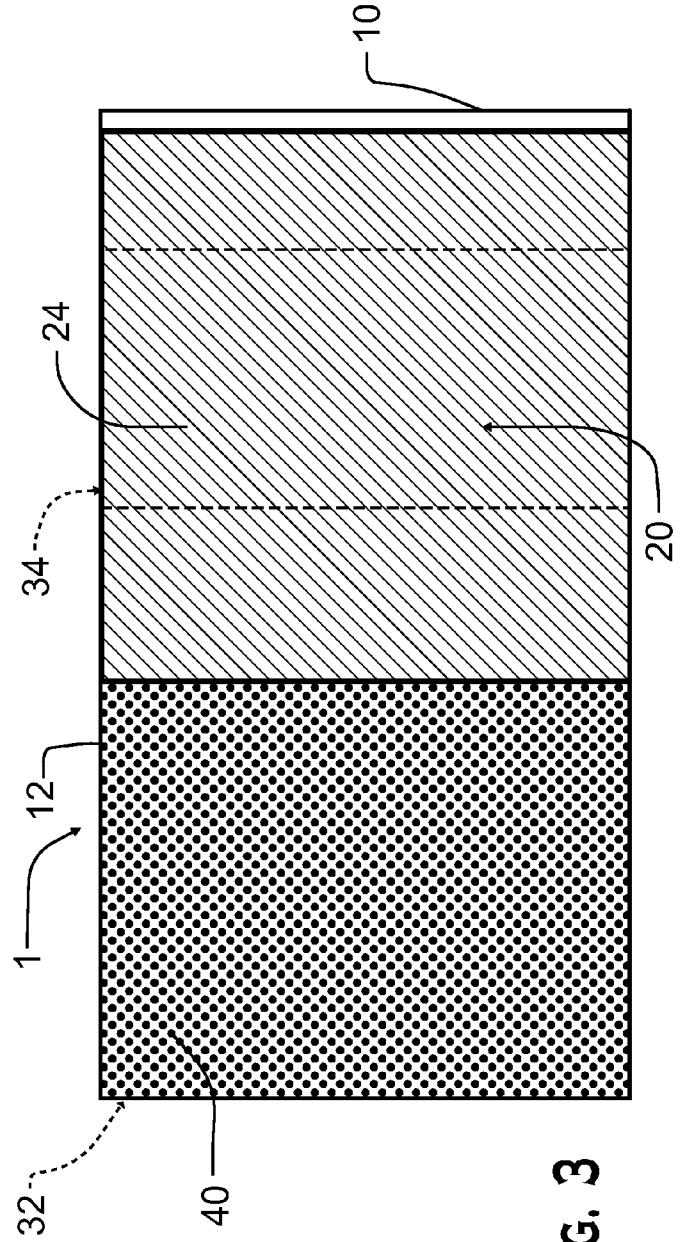


FIG. 3

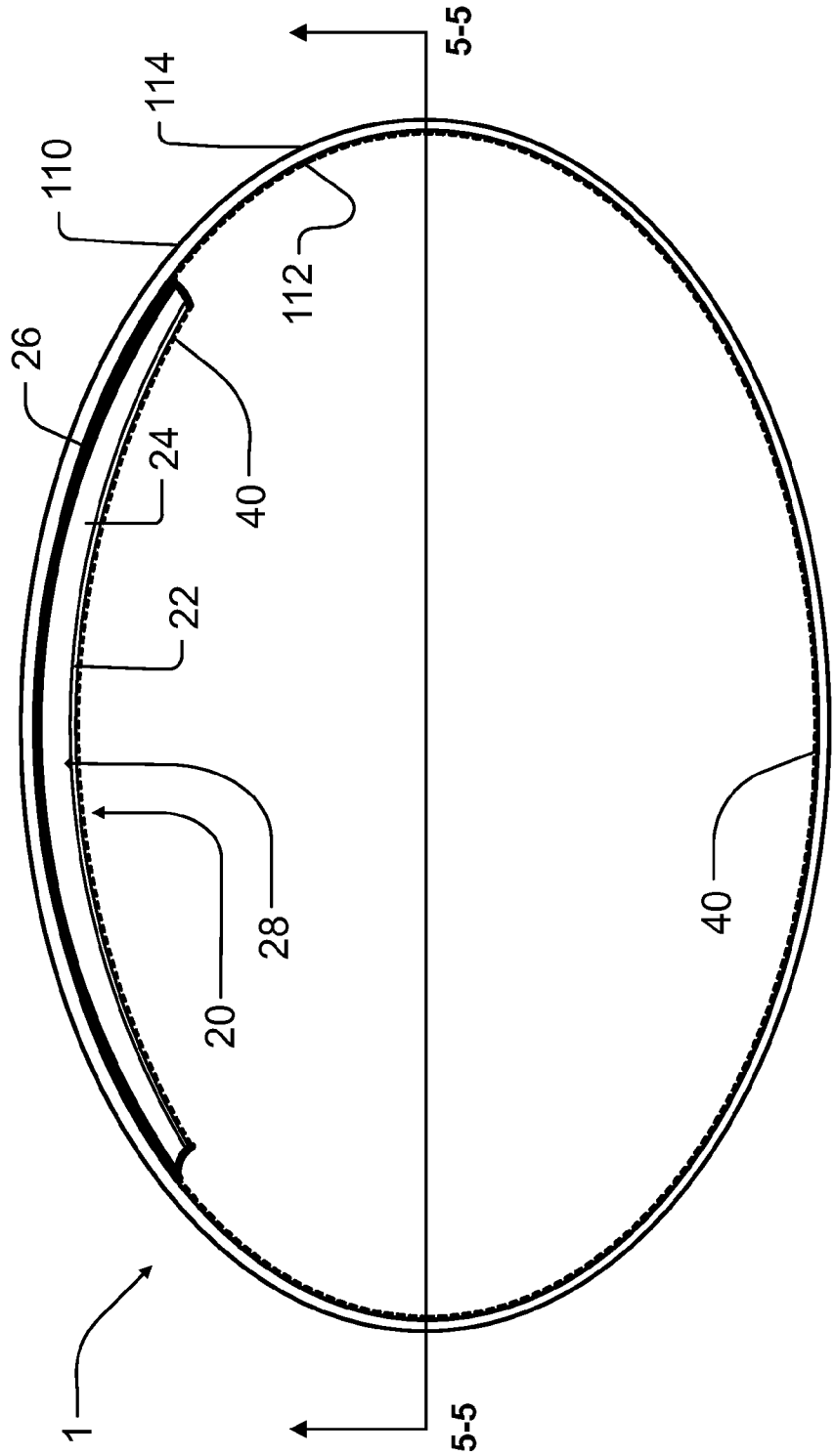


FIG. 4

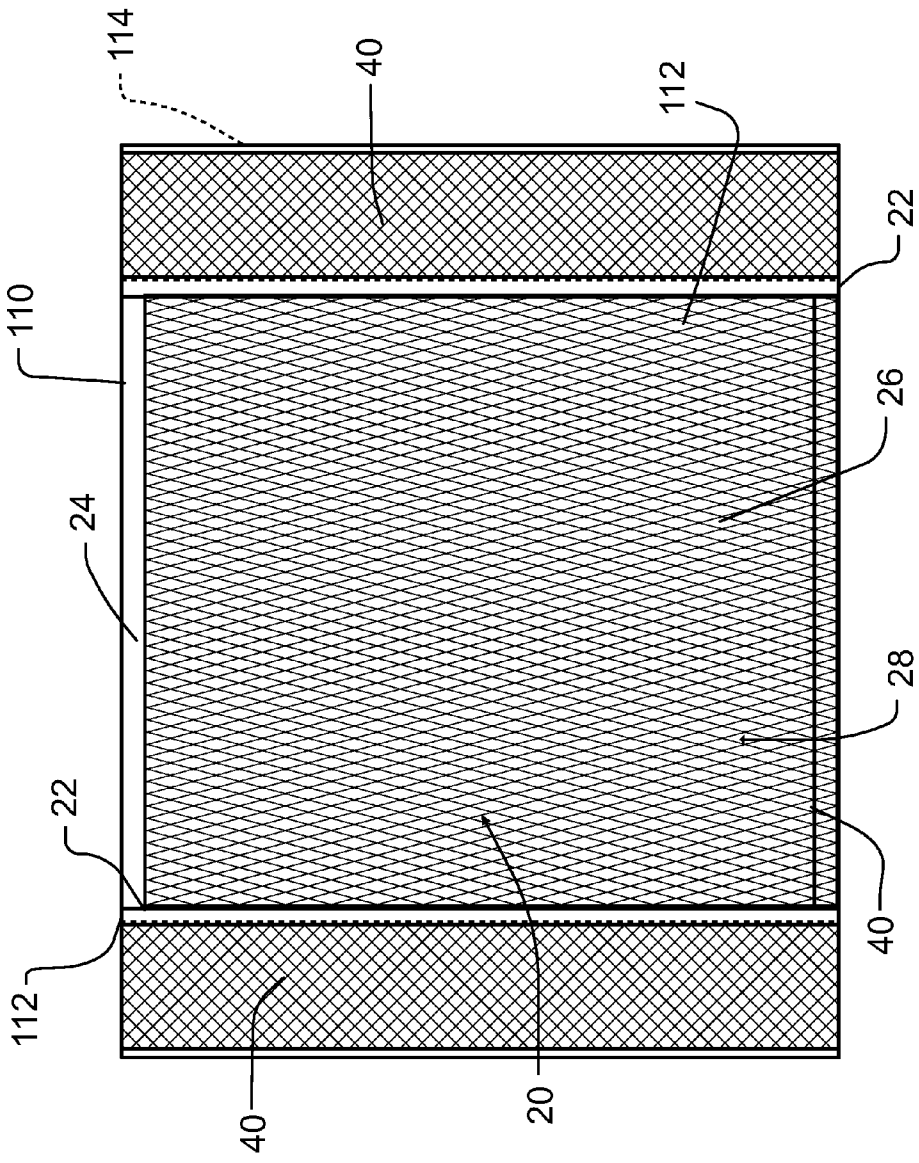


FIG. 5

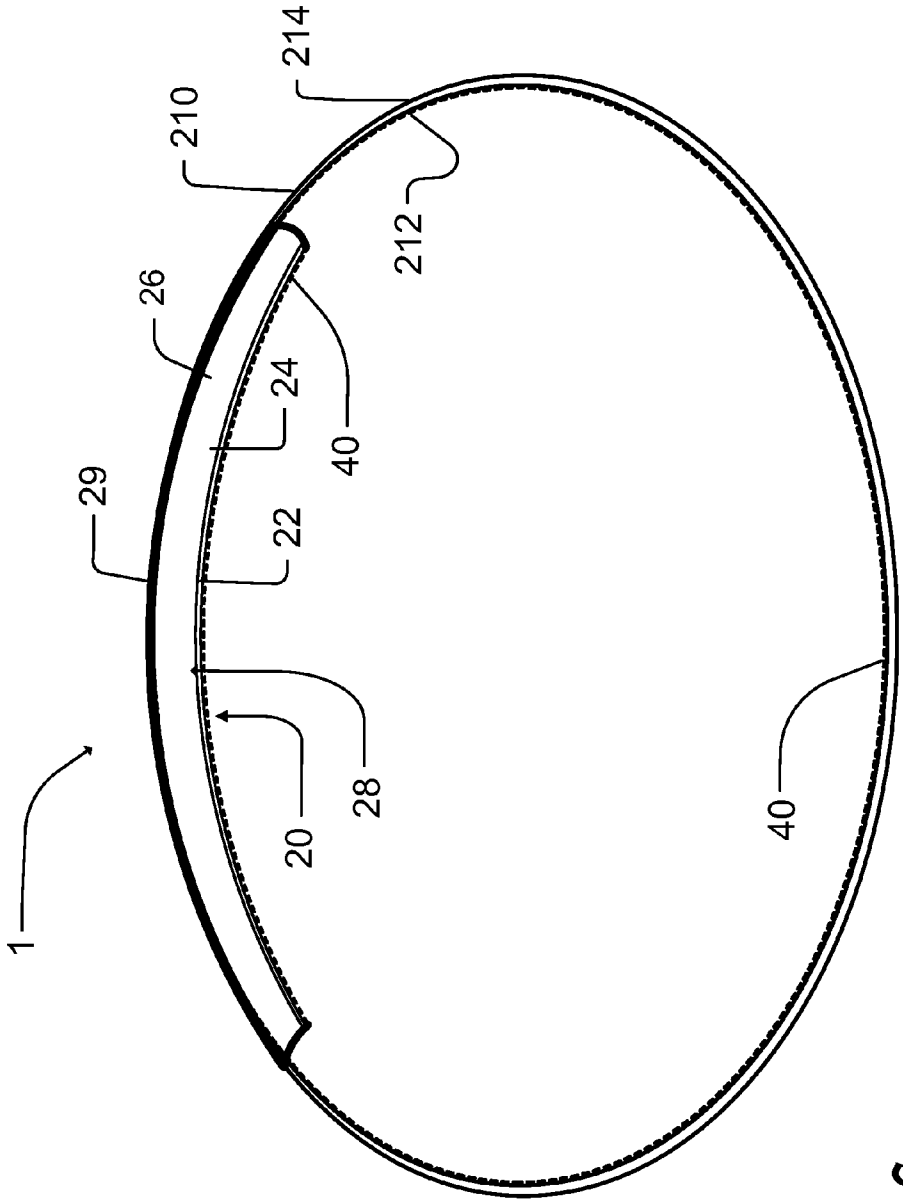


FIG. 6

WARMING DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit of the filing date under 35 U.S.C. §119(e) of Provisional Patent Application No. 61/467,802, filed Mar. 25, 2011.

FIELD OF THE INVENTION

[0002] The present invention relates to a warming device and in particular to a warming device having an internal pocket for receiving a heating element.

BACKGROUND

[0003] When the human body is exposed to cold temperatures, the body thermoregulates itself to keep its core body temperature within certain boundaries. For instance, blood vessels carrying blood to superficial capillaries under the surface of the skin can shrink (constrict), thereby rerouting blood away from the skin and towards the warmer core of the body. The body in defense reroutes blood from parts losing heat to the surroundings, and minimizes dropping of the core body temperature. However, in exposure to cold conditions, blood generally fails to maintain body temperature at the bodies extremities, such as the hands and feet. As a result, these extremities may become numb or frostbitten, which may cause permanent damage.

[0004] The ulnar and radial arteries are main blood vessels positioned in the forearm that extend into the hand. These arteries not only carry oxygenated blood through the forearm and to the hand, but also provide thermoregulation of body temperature in the hand. It is possible that heat is lost through thin skin in the wrist. As it is known, articles of clothing, such as gloves and jackets, insulate these areas, so the body can maintain some body heat as the blood flows through these arteries.

[0005] Warming devices are also known, that not only provide insulation but also a directed heat source to the exposed area. For instance, portable hand and feet warmers can be positioned in gloves and boots to provide activated heat directly to the exposed area. This heat radiates from the source in all directions. Many known warming devices, even used for heat therapy, include a pocket formed in an insulated material. However, the radiated heat is free to radiate away from the exposed area in all directions, and as a result, the warming device is inefficient in directing heat to the exposed area.

SUMMARY

[0006] In view of these needs, the present invention provides a warming device directing heat to a target area using reflective materials. The warming device includes a sleeve of insulating material, a heat pad receiving pocket, and a reflective material positioned inside the pocket. The heating pad receiving pocket is disposed along a first surface side of the sleeve, while the reflective material positioned inside of the heating pad receiving pocket along the first surface side of the sleeve.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The features and advantages of the present invention should become apparent from the following description when taken in conjunction with the accompanying drawings, in which:

[0008] FIG. 1 is a top view of a warming device according to the invention;

[0009] FIG. 2 is a sectional view of the warming device of FIG. 1, cut along the 2-2 line;

[0010] FIG. 3 is a sectional view of the warming device of FIG. 2, cut along the 3-3 line;

[0011] FIG. 4 is another warming device according to the invention;

[0012] FIG. 5 is a sectional view of the warming device of FIG. 4, cut along the 5-5 line and lying along full length from the cut line; and

[0013] FIG. 6 is another warming device according to the invention.

DETAILED DESCRIPTION OF THE EMBODIMENT(S)

[0014] Referring now to the drawings, a warming device 1 according to the invention is a device used to hold a heating pad (not shown) for warming of parts of the body. The warming device 1 is designed to hold and direct localized application of heat to underlying blood vessels and muscles in a target area. Types of heating pads may include electric pads, chemical heat reservoirs or a one-time chemical reaction pads, and/or a container having a material that has a high specific heat capacity. Heating pads are a type of temperature control element. It is conceivable that other types of temperature control elements could be used with the warming device according to the invention, including cooling elements.

[0015] According to the invention, the warming device 1 shown in FIGS. 1-3 includes a body 10, a pocket 20, and a fastener 30.

[0016] The body 10 is an insulative fabric designed as a sleeve to conform around a body part. For instance, the body 10 may be a spandex or neoprene type material, capable of stretching around a body part, such as a wrist or thigh. However, it is possible that the body 10 is made from other materials that are not stretchable, but flexible and come in differing sizes. The body 10 should be flexible in order to wrap and conform to the body part and cover the target area. The body 10 has a length L being greater than its width W, and greater than a pocket length L_p. The width W of the body 10 is substantially the same dimension of a pocket width W_p in the embodiment shown. However, it is possible that the width W of the body is larger than pocket width W_p, since pocket 20 may be incorporated into articles of clothing, such as sleeves, socks, etc. The dimensions, such as length and width, may vary depending on application of the warming device 1 to a specific target area, such as wrist, arm, torso, or leg.

[0017] In the embodiment shown, the body 10 includes a fastener 30 on an outer surface 14, while a pocket 20 is formed on an inner surface 12. The fastener 30 is adapted to the outer surface 14 of the body 10, and secures two ends of the body 10 around the body part and covers the target area, in the embodiment shown. For instance, the fastener 30 may be secured to the outer surface 14 through a hem, a seam, and/or adhesive. As shown in FIG. 1, the fastener 30 may be a pair of fabric sections having hook-and-loop fasteners, a first fastener 32 and a second fastener 34. The first fastener 32 is positioned at one end of the body 10, while the second fastener 34, which has a larger surface area than the first fastener 32, is positioned inward from another end of the body 10 in the embodiment shown. However, it is possible that the second fastener 34 is positioned at the other end, and extends to a substantial middle of the outer surface 14. For instance, in this embodi-

ment, the second fastener **34** includes a larger surface area to adjust the body **10** around a body part and secure the pocket **20** over the target area.

[0018] It is possible that the fasteners may be other types of fasteners, such as buttons, clips and hooks, and fabric grip, which may secure the body **10** and pocket **20** over the target area. If other fasteners are used, then position of those fasteners should allow for accommodation and securing of the warming device **1** around a body part.

[0019] While the fastener **30** is used to secure the warming device **1**, a layer of grip **40** may be applied to the inner surface **12** of the body **10**. The grip **40** may be any applicable material used for friction and resistance. The grip **40** can be layered on an entirety of open surface or applied in sections, and is used to prevent the warming device **1** from slippage or movement away from the target area of the body part. Types of grip **40** may be a layer of cloth, a layer of adhesive, or applied polymers.

[0020] As shown in FIGS. **2** and **3**, the pocket **20** is positioned on the inner surface **12** of the body **10**. The pocket **20** is designed to hold an existing heating pad, which may be disposable or recyclable. The pocket **20** dimensions, including pocket length L_p and pocket width W_p , may vary. For instance, the warming device **1** used leg applications may include multiple heating pads, and accordingly, the pocket **20** will have larger dimensions to accommodate multiple heating pads. Additionally, it is possible that larger warming devices **1**, include multiple pockets **20**, which may be strategically positioned for placement over a large target area or multiple target area of a single body part.

[0021] The pocket **20** includes a front wall **22**, a receiving passageway **24**, a reflective backing material **26**, and an internal compartment **28** formed as open space between the front wall **22**, receiving passageway **24**, and reflective backing material **26**. The front wall **22**, in the shown embodiment, is made from the same material as the body **10**. However, it is possible that the front wall **22** is prepared from a shear or perforated material that does not infringe on heat passing there through. In addition, the front wall **22**, in the shown embodiment, secures to the inner surface **12** of the body **10** along three sides of the front wall **22**, and a receiving passageway **24** is formed along an open end. The receiving passageway **24** allows for ingress and egress of a heating pad within the pocket **20**. The receiving passageway **24** has a depth D that is large enough to receive the heating pad, but small enough to secure the heating pad in the pocket **20**. If the front wall **22** is elastic, then the receiving passageway **24** can also be elastic. As a result, the receiving passageway **24** can open and close, first receiving the heating pad and securing the heating pad in the internal compartment **28** of the pocket **20**.

[0022] The pocket **20** further includes the reflective backing material **26** used to focus heat from the heating pad to the target area. The reflective backing material **26** is positioned along the inner surface **12** of the body **10**. In the embodiment shown, the reflective backing material **26** is a section of fabric that covers one or more surfaces of the internal compartment **28**. In the least, the reflective backing material **26** covers a side opposite the front wall **22**. However, the reflective material can also cover sides that extend from the inner surface **12** of the body **10** to the front wall **22**.

[0023] The reflective backing material **26** is any material capable of radiating heat away from the surface of the reflective backing material **26**. For instance, the reflective backing

material **26** may be a metalized polyester film made from stretched polyethylene terephthalate (PET). These materials are known and used their high tensile strength, chemical and dimensional stability, transparency, reflectivity, gas and aroma barrier properties and electrical insulation. Other materials that perform similar properties may be used as well. Accordingly, the reflective backing material **26** radiates heat, directed away from the target area, back to the target area, performing insulation nonetheless. As a result, heat loss is minimized and the warming device **1** is more efficient than standard heating pads and apparatuses.

[0024] A layer of grip **40** may be further applied on an outer surface of the front wall **22**, as shown in FIG. **2**. The grip **40** may any applicable material used for friction and resistance. The grip **40**, wherever positioned, is used to prevent the warming device **1** from slippage or movement away from the target area of the body part. Types of grip **40** may be a layer of cloth, a layer of adhesive, or applied polymers. If the front wall **22** is perforated, then the grip **40** should not interfere with the perforations. Furthermore, the grip **40** should not impede radiation of heat from the heating device, but may insulate heat applied to the target area.

[0025] In another embodiment shown in FIGS. **4** and **5**, the warming device **1** includes a body **110** that is a sleeve of material. A fastener **30** is not needed since the body **110** is a sleeve through which a body part is inserted. The pocket **20** is positioned inside the body **110**, along an inner surface **112** of the sleeve. The pocket **20** includes a front wall **22**, a receiving passageway **24**, and a reflective backing material **26** used to focus heat from the heating pad to the target area. The front wall **22** is made from the same material as the body **110**. However, it is possible that the front wall **22** is prepared from a shear or perforated material that does not infringe on heat passing there through.

[0026] As shown in FIG. **5**, the front wall **22** attaches to the inner surface **112** of the body **110** along three sides, leaving a receiving passageway **24** to receive the heating pad within the pocket **20**. The receiving passageway **24** has a depth D that is large enough to receive the heating pad, but small enough to secure the heating pad in the pocket **20**. If the front wall **22** is elastic, then the receiving passageway **24** can also be elastic. As a result, the receiving passageway **24** can open and close, receiving the heating pad and securing the heating pad in an internal compartment **28** of the pocket **20**.

[0027] The reflective backing material **26** is positioned along the inner surface **112** of the body **110**. The reflective backing material **26** is a section of fabric that covers one or more surfaces of the internal compartment **28**. In the least, the reflective backing material **26** covers a side opposite the front wall **22**. However, the reflective material can also cover sides that extend from the inner surface **112** of the body **110** to the front wall **22**. Hence, the reflective backing material **26** cups the heating pad inserted into the internal compartment **28**.

[0028] The reflective backing material **26** is a material capable of radiating heat away from the surface of the reflective backing material **26**. For instance, the reflective backing material **26** may be a metalized polyester film made from stretched polyethylene terephthalate (PET). However, other materials that perform similar thermal properties may be used as well. The reflective backing material **26** reflects heat that has been directed away from the target area, back to the target area. Additionally, the reflective backing material **26** may include an insulation layer to perform insulation, as well.

[0029] A layer of grip 40 may be further applied to the inner surface 112 of the body 110 as well as an outer surface of the front wall 22, as shown in FIG. 5. Again, the grip 40 may any applicable material used for friction and resistance. The grip 40 is used to prevent the warming device 1 from slippage or movement away from the target area of the body part. Types of grip 40 may be a layer of cloth, a layer of adhesive, or applied polymers. If the front wall 22 is perforated, then the grip 40 should not interfere with the perforations. Furthermore, the grip 40 should not impede radiation of heat from the heating device, but may insulate heat applied to the target area.

[0030] As shown in FIG. 6, another warming device 1 is shown having a body 210 having two ends that connect with a pocket 20, as described above. However, the reflective backing material 26 has an additional wear layer 29 that is positioned on an outer surface of the reflective backing material 26. The wear layer 29 is positioned with an outer surface 214 of the body 210, and protects the reflective backing material 26 from exposure.

[0031] The foregoing illustrates some of the possibilities for practicing the invention. Many other embodiments are possible within the scope and spirit of the invention. For instance, the pocket 20 described above, may be utilized in the construction of gloves, socks, sporting equipment, shoes, and/or boots. It is, therefore, intended that the foregoing description be regarded as illustrative rather than limiting, and that the scope of the invention is given by the appended claims together with their full range of equivalents.

What is claimed is:

- 1. A warming device comprising:
 - a sleeve of insulating material,
 - a heating pad receiving pocket disposed along a first surface side of the sleeve; and
 - a reflective material positioned inside of the heating pad receiving pocket along the first surface side of the sleeve.
- 2. The warming device according to claim 1, wherein the heating pad is a one-time chemical reaction pad.
- 3. The warming device according to claim 1, wherein the sleeve is flexible.
- 4. The warming device according to claim 3, wherein one end on the sleeve includes a fastener that connects to another end of the sleeve to form an adaptive wrap.
- 5. The warming device according to claim 4, wherein the fastener comprises a hook-and-loop fastener system.
- 6. The warming device according to claim 1, further comprising a layer of grip disposed along the first surface side of the sleeve and an outer surface of the heating pad receiving pocket.
- 7. The warming device according to claim 6, wherein the layer of grip is a frictional and resistance material.
- 8. The warming device according to claim 6, wherein the layer of grip is an adhesive.
- 9. The warming device according to claim 1, wherein the heating pad receiving pocket includes at least two sides secured to the sleeve and at least one opening for receiving the heating pad.
- 10. The warming device according to claim 9, wherein the heating pad receiving pocket is elastic.
- 11. The warming device according to claim 9, wherein the heating pad receiving pocket includes a front wall prepared from a perforated material.
- 12. The warming device according to claim 11, wherein the reflective material faces the front wall.

13. The warming device according to claim 1, wherein the reflective material is a metalized polyester film made from stretched polyethylene terephthalate (PET).

14. The warming device according to claim 1, further comprising a wear layer positioned on an outer surface of the reflective material.

15. The warming device according to claim 1, further comprising another wear layer positioned on an outer surface of the sleeve.

16. The warming device according to claim 1, wherein the heating pad receiving pocket includes at least three sides lined with the reflective material.

17. The warming device according to claim 1, wherein the sleeve is an elastic tubular structure having an outer surface and an inner surface on which the heating pad receiving pocket is positioned.

18. The warming device according to claim 17, further comprising a layer of grip disposed along the first surface side of the sleeve and an outer surface of the heating pad receiving pocket.

19. The warming device according to claim 17, wherein the heating pad receiving pocket includes at least two sides secured to the sleeve and at least one opening for receiving the heating pad.

20. The warming device according to claim 19, wherein the heating pad receiving pocket is elastic.

21. The warming device according to claim 20, wherein the heating pad receiving pocket includes a front wall prepared from a perforated material.

22. The warming device according to claim 21, wherein the reflective material faces the front wall.

23. The warming device according to claim 17, further comprising a wear layer positioned on an outer surface of the reflective material.

24. The warming device according to claim 17, wherein the heating pad receiving pocket includes at least three sides lined with the reflective material.

25. A blank for a temperature control element, the blank comprising:

- a sleeve of insulating material,
- a temperature controlled element receiving pocket disposed along a first surface side of the sleeve and adapted to removably secure the temperature control element against the first surface side of the sleeve; and
- a reflective material positioned inside of the pocket along the first surface side of the sleeve and facing the pocket.

26. A warming device comprising:

- a sleeve of insulating material,
- a heating pad receiving pocket disposed between two ends of the sleeve; and
- a reflective material positioned along an inner surface of the pocket.

27. The warming device according to claim 26, wherein the pocket includes at least two sides secured to the sleeve and at least one receiving passageway.

28. The warming device according to claim 27, wherein the pocket is elastic.

29. The warming device according to claim 26, wherein the pocket includes a front wall prepared from a perforated material and a rear wall having the reflective material.

30. The warming device according to claim 29, wherein the reflective material faces the front wall.