June 4, 1935. A. C. GILBERT 2,003,830

HEATING PAD

Filed Nov. 28, 1931

Fig. 1.

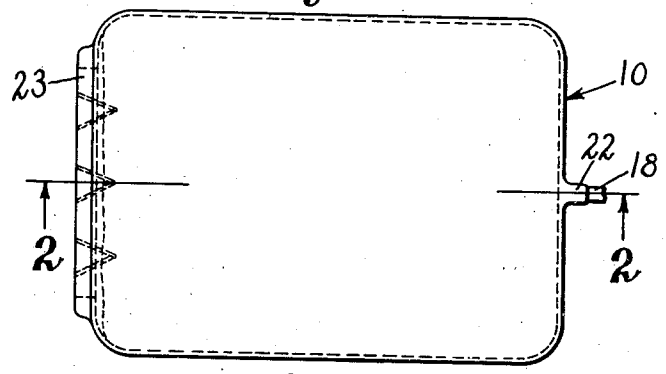


Fig. 2.



Fig. 3.

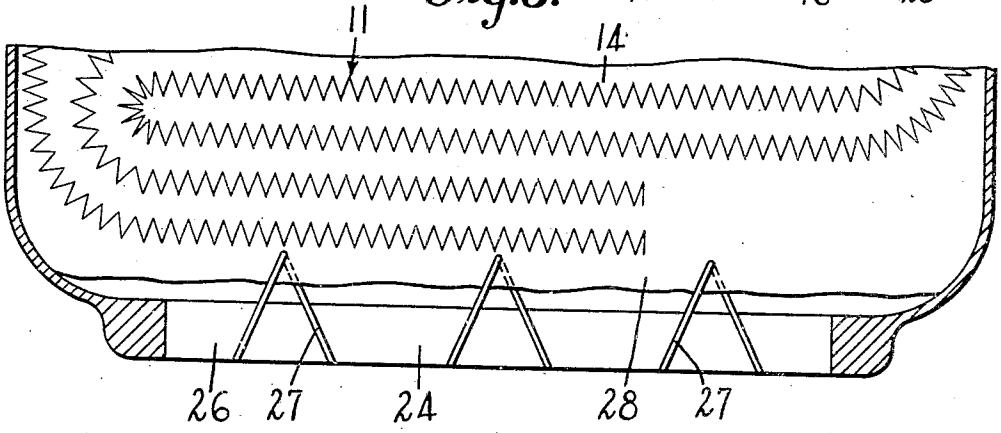


Fig. 4.

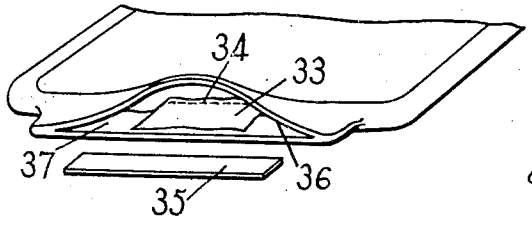
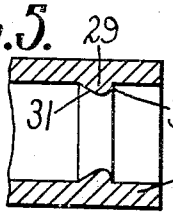


Fig. 5.



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HEATING PAD

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Application November 28, 1931, Serial No. 577,755

29 Claims. (Cl. 219—46)

My invention relates to a heating pad, and more especially to an electric resistance heating pad of the type which may be applied to the human body for therapeutic purposes or utilized in heating a bed, or the like.

Generally speaking, the invention relates to an electric heater in which a flexible, relatively flat envelope is provided in which the resistance elements are mounted, and one of the principal objects of the invention is to bring about a form of heater pad in which the heating elements may be readily assembled in the envelope.

A further object of the invention is to bring about a form of heating pad in which the envelope and heating units may be separately formed and assembled as unitary structures before the heating unit is assembled within the envelope.

A still further object of the invention is to bring about a form of heating pad in which the heating elements are anchored within the protective envelope and held against movement therein.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the drawing:

Fig. 1 is a plan view of a heating pad according to my invention;

Fig. 2 is a cross-sectional view along line 2—2 of Fig. 1, but on an enlarged scale;

Fig. 3 is a cross-sectional view along line 3—3 of Fig. 2, but on an enlarged scale;

Fig. 4 is a perspective of a modification, and

Fig. 5 is a view in cross-section of a constructional detail.

Referring to the drawing in which I have illustrated my invention by showing a preferred embodiment of the same, the reference numeral 10 indicates, in general, my improved heating pad which comprises an electric resistance heater, generally designated by the reference numeral 11, and an envelope 12 of rubber or other suitable material.

The heating unit 11 comprises a pair of spaced sheets of suitable fabric 13 and 14, between which the resistance elements 15 are mounted, the latter comprising one or more helical coils 16, wrapped around asbestos cores 17 and sewed to either or both of sheets 13 and 14, in this instance the coil 16 being sewed to sheet 14 only. Attached to fabric sheets 13 and 14 and connected to coil 16 is a cord 18 which may be connected in any suitable manner to a source of electrical energy.

The reference numeral 19 indicates, in general, the envelope which may be molded as a complete unitary structure or may be formed out of similar halves 20 and 21, vulcanized together at their edge portions. The envelope 19 is provided at one end with a hollow neck 22 and at its opposite end with an elongated projection 23, having an opening 24 of considerable width and providing for the introduction of the heating unit 11 into the interior of the envelope 19, the cord 18 of the heating element being first inserted through the opening 24 and then through neck 22, and the body of the heating element being drawn into the envelope 19 after the cord 18. After the heating element has been placed within the envelope 19, the opposite faces 25 and 26 of the slit 24 may be joined together by a suitable cement or by the use of a strip or rubber impregnated tape, prior to which a number of threads 27, passing through the end 28 of resistance heater 11 are drawn outwardly through the opening 24, the ends of the threads being sealed between the opposite faces 25 and 26 to anchor the adjacent end of the resistance heater against movement, the cord 18 being held against movement in neck 22 by means of the annular rib or bead 29 formed within the opening in neck 22 and extending into the annular groove 30 in cord 18. The shape of the bead is such that it permits the ready insertion of the cord into the neck from the envelope but tends to oppose motion of the cord in the opposite direction. Thus, the bead 29 is provided at one side with a gradually sloping surface 31 to permit the ready insertion of the cord through the neck 22, and an abruptly sloping surface 32 which, when the bead is in the groove 30, opposes the movement of the cord 18 back into the envelope.

In Fig. 4 of the drawing I have shown a modification of the invention in which a piece of rubberized fabric or tape 33 is sewn or otherwise attached to the end of the heating element as at 34, a short piece of uncured rubber 35 being inserted between the lips 36 and 37, which is preferably cured under pressure by steam heat, thus sealing the lips together on the tape 33.

From the above description of the invention it will be readily understood that the resistance heating element 11 may be completely assembled in a unitary structure before being inserted within the envelope 19, the sealing of the open end of the latter completely closing the envelope and protecting the resistance heater against the entrance of water or the like, the threads 27, or tape 33 as the case may be, which are sealed into the envelope, holding the adjacent end of the heater securely against movement while the op-

posite end is held against movement by the bead 29 in groove 30.

If repairs become necessary in the heating unit, the faces 25 and 26 may be separated by the insertion of a knife or the like and the opening 24 again formed whereupon the resistance heater may be withdrawn, repaired and sealed in the envelope 19 according to the above methods.

Preferably the opening or slit for the introduction of the heating element is located at that end of the envelope which is remote from the end having the hollow neck 22 to receive the conductor cord, and along the sides of the slit extend the opposing parallel lips which in conjunction form the elongated projection 23, previously referred to.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to the details shown but is capable of modification and variation within the spirit of the invention and the scope of the appended claims.

What I claim is:

1. In a heating pad, a sealed envelope of plastic material, a flat relatively thin resistance heating element mounted loosely in the envelope, and means for attaching one of the edge portions of the heating element to the envelope comprising means attached to the heating element and embedded in the material forming the envelope and at one end thereof.

2. In a heating pad, a sealed envelope of plastic material, a flat relatively thin resistance heating element mounted loosely in the envelope, and means for attaching an edge portion of the resistance heating element to the envelope comprising threads attached to the heating element and extending toward and being embedded in the material forming the envelope at one edge thereof.

3. In a heating pad, a hollow envelope sealed along substantially all of its edges to form substantially a one-piece structure, a resistance heating element assembled within the envolope, said envelope having a slit at one end thereof, means for sealing the slit in said envelope when the heating element is assembled within the envelope, and means extending into the slit at one end of the envelope for attaching an edge portion of the heating element to the envelope, said means being sealed in the slit when the same is sealed by said sealing means.

4. In a heating pad, a hollow envelope sealed along substantially all of its edges to form substantially a one-piece structure, a resistance heating element assembled within the envelope, said envelope having a slit at one end thereof, means for sealing the slit in said envelope when the heating element is assembled within the envelope, and means for attaching an edge portion of the heating element to the envelope, said means comprising an element secured to the resistance heating element extending through and sealed in and with said slit by said sealing means.

5. In a heating pad, a hollow envelope sealed along substantially all of its edges to form substantially a one-piece structure, a resistance heating element assembled within the envelope, said envelope having a slit at one end thereof, means for sealing the slit in said envelope when the heating element is assembled within the envelope, and means for attaching an edge portion of the heating element to the envelope, said last named means comprising threads attached to the heating element and extending into and sealed in and with the slit by said sealing means.

6. In a heating pad, an envelope of plastic material, a resistance heater in said envelope, said resistance heater comprising a sheet of fabric having resistance wires attached thereto, and means for attaching at least one edge portion of the fabric to the envelope, said last named means comprising threads passing through said fabric and embedded in the material of said envelope at an edge thereof.

7. In a heating pad, an envelope of vulcanizable material, a heating element assembled within said envelope, said envelope having a slit at one end thereof through which said element may pass, said heating element comprising a sheet of fabric and an electric resistance heater attached thereto, means to seal the slit and means for securing one edge portion of the heating unit to the envelope comprising means on the heating unit extending into and sealed in and with said slit, said slit sealing means comprising a strip of vulcanizable material.

8. In a heating pad, an envelope of vulcanizable material, a heating element assembled within said envelope, said envelope having a slit at one end thereof through which said element may pass, said heating element comprising a sheet of fabric having an electric resistance heater attached upon a face thereof, means to seal said slit, and means for securing at least one edge portion of the heating unit to the envelope comprising threads sewed through an edge of said fabric and sealed in and with said slit, said slit sealing means comprising a strip of vulcanizable material.

9. In a heating pad, an envelope of vulcanizable material, a heating element assembled within said envelope, said envelope having a slit at one end thereof through which said element may pass, said heating element comprising a sheet of fabric and an electric resistance heater attached upon a surface thereof, means for sealing said slit, and means for securing at least one edge portion of said sheet of fabric to the envelope comprising a piece of tape attached to said fabric extending into and sealed in and with said slit, said slit sealing means comprising a strip of vulcanizable material.

10. In a heating pad, an envelope of rubber, a resistance heating element assembled within the envelope, said envelope having a slit at one end thereof through which said element may pass, adhesive means for sealing the slit when the heating element is assembled within the envelope, and means for attaching an edge portion of the heating element to the envelope, said means comprising a piece of rubberized fabric attached to the resistance heating element and extending into said slit, said fabric being sealed within said slit by said adhesive means.

11. In a heating pad, a rubber envelope, a heating element assembled within said envelope, said envelope having a slit at one end thereof through which said element may pass, said heating element comprising a sheet of fabric and an electric resistance heater attached thereto, and a piece of rubberized fabric attached to an end of the sheet of fabric and extending into said slit, the slit end of the envelope being vulcanized to seal the slit and the rubberized fabric therein.

12. A heating pad comprising an outer covering in the form of a flat envelope, said envelope having a hollow neck at one end and a sealed slit at the other end thereof, a flat resistance heating element within said outer covering, said heating element having terminals extending therefrom through and sealed in said hollow neck, the edge of

said heating element adjacent the sealed slit edge of said covering having elements secured thereto and extending therefrom into and sealed with said slit.

13. A heating pad comprising opposed sheets of material having their adjacent peripheral edges sealed together to form a flat and comparatively thin hollow envelope, and a resistance heating element secured to a flat sheet of material disposed within said hollow envelope, said sheet of material having the heating element thereon being secured to said envelope at one end by the sealing of heating element terminals in one edge of said envelope and at the other and opposite end by the sealing of an element secured to the adjacent edge of said sheet of material into the other and opposite edge of said envelope between the opposing sheets of material forming said envelope.

14. A heating pad comprising an outer covering of moisture-proof material in the form of a flat envelope, said envelope having a hollow neck at one end formed of the same material, said neck having an annular rib about its interior periphery, a heating element within said envelope, said heating element having a terminal containing cord extending therefrom and through said neck, said neck being compressed closely about said cord and sealed thereto.

15. A heating pad comprising an outer covering of moisture-proof material in the form of a flat envelope, said envelope having a hollow neck at one end formed of the same material, said neck having an annular rib about its interior periphery, a heating element within said envelope, said heating element having a terminal containing cord extending therefrom and through said neck, said neck being compressed closely about said cord and sealed thereto, said rib extending into the material of said cord to secure it to said neck against relative movement in respect thereto.

16. A heating pad comprising an outer covering of moisture-proof material in the form of a flat envelope, said envelope having a hollow neck at one end formed of the same material and having the material of its upper and lower portions extending beyond their meeting point along the end thereof opposite said neck and extended laterally of said envelope substantially its entire width, a heating element within said envelope, said heating element having an extension piece disposed between said envelope extensions and sealed therebetween when they are sealed together, and a terminal containing-cord extending from said heating element through said neck and sealed therein whereby said heating element is retained within said envelope free from its top and bottom but secured against lateral movement by connection with said envelope at said neck and at the end opposite said neck.

17. A heating pad comprising an outer covering of moisture-proof material in the form of a flat envelope, said envelope having a hollow neck at one end formed of the same material and having the material of its upper and lower portions extending beyond their meeting point along the end thereof opposite said neck and extended laterally of said envelope substantially its entire width, a heating element within said envelope, said heating element having an extension piece disposed between said envelope extensions and sealed therebetween when they are sealed together, said neck having an annular rib about its interior periphery, said heating element having a terminal containing cord extending therefrom and through said neck, said neck being compressed closely about said cord and sealed thereto whereby said heating element is retained within said envelope free from its top and bottom and side edges but secured against lateral movement by connection therewith at said neck and the end opposite said neck.

18. A heating pad comprising an outer covering of moisture-proof material in the form of a flat envelope, said envelope having a hollow neck at one end formed of the same material and having the material of its upper and lower portions extending beyond their meeting point along the end thereof opposite said neck and extended laterally of said envelope substantially its entire width, a heating element within said envelope, said heating element having an extension piece disposed between said envelope extensions and sealed therebetween when they are sealed together, said neck having an annular rib about its interior periphery, said heating element having a terminal containing-cord extending therefrom and through said neck, said neck being compressed closely about said cord and sealed thereto, said rib extending into the material of said cord to secure it to said neck against relative movement in respect thereto, whereby said heating element is retained within said envelope free from its top and bottom and sides but secured against lateral movement by connection therewith at said neck and the end opposite said neck.

19. A heating pad comprising a hollow outer covering closely sealed along its entire peripheral edge, an electrical resistance heating unit loosely disposed within said covering, said heating unit having electrical terminals extending therefrom, said electrical terminals extending through and sealed with one edge of said outer covering and said unit having supporting means secured thereto, said means extending into and sealed with another edge of said outer covering.

20. A heating pad comprising a hollow outer covering closely sealed along its entire peripheral edge, an electrical resistance heating unit loosely disposed within said covering, said heating unit having electrical terminals extending from one edge thereof, said electrical terminals extending through and sealed with an adjacent edge of said outer covering and said unit having supporting means secured to another and opposite edge thereof, said means extending into and sealed with an adjacent edge of said outer covering.

21. A heating pad comprising a hollow outer covering of material adapted to be flowed together at jointures thereof to seal the same, said covering being closely sealed along its entire peripheral edge, an electrical resistance heating unit loosely disposed within said covering, said heating unit having electrical terminals extending therefrom, said electrical terminals extending through and sealed with one edge of said outer covering and said unit having anchoring means secured thereto, said means extending into and sealed with another edge of said outer covering.

22. A heating pad comprising a hollow outer covering of material adapted to be flowed together at jointures thereof to seal the same, said covering being closely sealed along its entire peripheral edge, an electrical resistance heating unit loosely disposed within said covering, said heating unit having electrical terminals extending from one edge thereof, said electrical terminals extending through and sealed with an adjacent edge of said outer covering and said unit

having anchoring means secured to another and opposite edge thereof, said means extending through and sealed with an adjacent edge of said outer covering.

23. A heating pad comprising a hollow outer covering of material adapted to be flowed together at jointures thereof to seal the same, said covering being closely sealed along its entire peripheral edge, an electrical resistance heating unit loosely disposed within said covering, one edge only of said heating unit being secured to an adjacent edge of said covering, said heating unit having electrical terminals extending from one edge thereof, said electrical terminals extending from and sealed with an adjacent edge of said outer covering.

24. In a heating pad, a flat flexible elastic outer envelope, a conductor cord extending into said envelope through one end thereof, a flat web-like heating element located within said envelope and connected with said conductor cord at one end of said element, and means for sealing the opposite end of said element within the marginal portion of said envelope.

25. In a heating pad, a flat flexible impervious outer envelope, and a flat web-like heat transmitting member located within said envelope, said latter member also being flexible and held in assembled relation with respect to the envelope by being anchored to the envelope at opposite ends of said element.

26. In a heating pad, a flat flexible impervious outer envelope, and a flat web-like heat transmitting member located within said envelope, said latter member also being flexible and being held in assembled relation with respect to the envelope by anchoring it to the envelope at opposite ends of said element, the middle portion of said heat transmitting member being free of said envelope.

27. In a heating pad, a flat flexible elastic outer envelope having a slit along one margin, and a flat flexible web-like element within said envelope carrying flexible resistance heating means and having anchoring means extending into and sealed with said slit.

28. In a heating pad, a flat rubber envelope having a slit at one end, a flat flexible web-like element sealed at one margin in said envelope within and by said slit, flexible resistance wire carried by said element, and means at the opposite margin of said web-like element for holding it in place relatively to said envelope.

29. An electric heating pad comprising a flat flexible rubber envelope having a neck at one end, a web-like flexible element encased loosely in said envelope, a flexible resistance heating member carried by said web-like element and having terminals extending outwardly through said neck, and means at the end of the envelope opposite said terminals for anchoring and sealing said web-like element within the end portion of the envelope.

ALFRED C. GILBERT.