

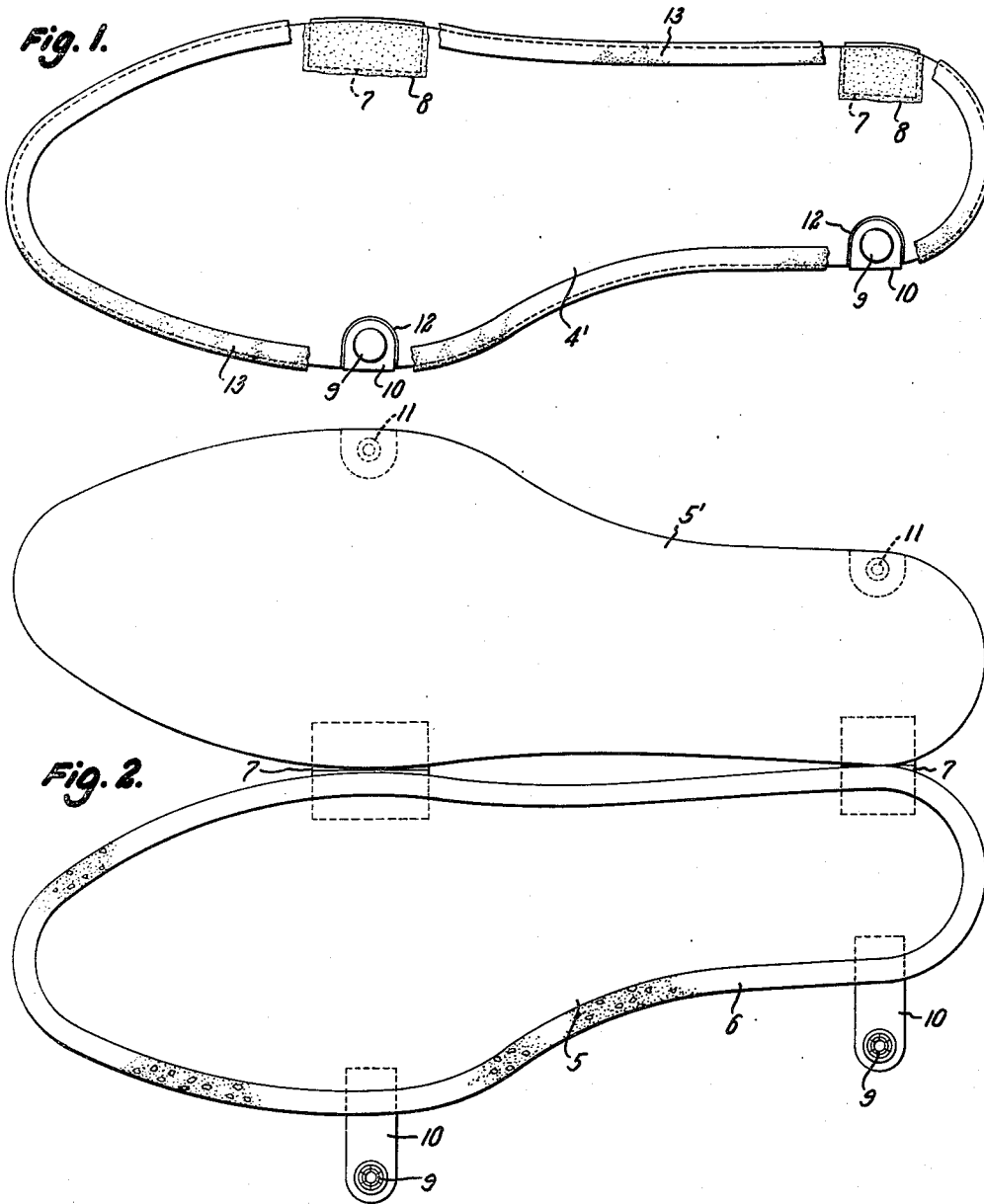
April 20, 1954

G. A. YOUMANS  
ENCASED HEATING PAD

2,675,630

Filed March 20, 1953

2 Sheets-Sheet 1



INVENTOR:

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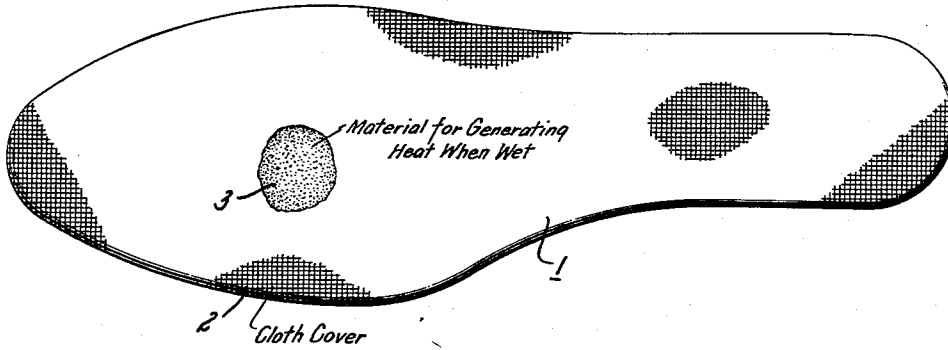
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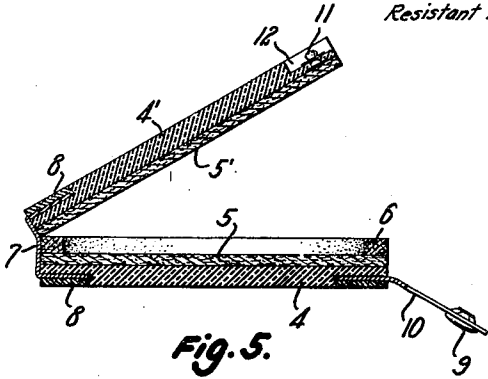
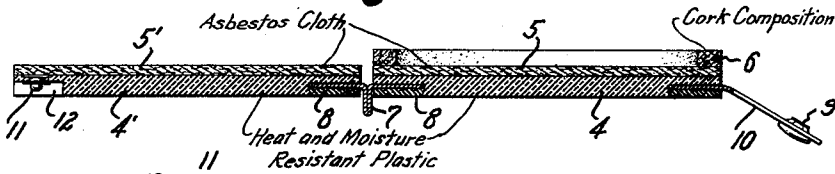
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2 Sheets—Sheet 2

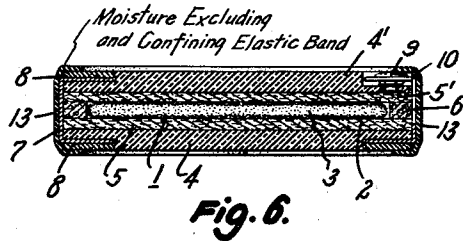
**Fig. 3.**



**Fig. 4.**



**Fig. 5.**



**Fig. 6.**

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# UNITED STATES PATENT OFFICE

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## ENCASED HEATING PAD

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Application March 20, 1953, Serial No. 343,553

7 Claims. (Cl. 36—2.6)

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This invention relates to encased heating pads and more particularly to casings with chemical heating pads therein, the assemblies being adapted for insertion in pockets of the clothing worn by persons who must remain outdoors for extended periods in cold weather, for example soldiers, policemen, mail carriers and various classes of workmen.

Different articles of clothing may be provided with pockets at points where an encased heating pad may be held in proximity to parts of the body at which the blood flows close to the skin, for example at the wrists, inside the elbows or under the knees, or the pockets may be provided in the clothing, mittens or shoes, worn on the parts of the body which are most quickly chilled at low temperatures.

Objects of the invention are to provide encased heating pads of high heat capacity which may be used in pockets in articles of clothing, and in which the case or housing of the pad protects the wearer against excessive local heating. Objects are to provide encased heating pads which include layers of asbestos for retarding the transfer of heat from a chemical heating pad. More specifically, an object is to provide encased heating pads in the form of shoe soles which may be employed as inner soles in special shoes or as outer soles suitably held to the soles of conventional shoes.

These and other objects and the advantages of the invention will be apparent from the following specification when taken with the accompanying drawings in which:

Fig. 1 is a top plan view of an encased heating pad embodying the invention;

Fig. 2 is a plan view of the casing in open condition;

Fig. 3 is a plan view of the chemical heating pad;

Figs. 4 and 5 are transverse sections through the casing and showing the same in open and in partially closed condition, respectively; and

Fig. 6 is a transverse section through the encased heating pad and showing its edges sealed with an elastic band.

In the drawing, the reference numeral 1 identifies a so-called "chemical heating pad" of known type comprising a cloth bag or envelope 2 containing a mass of powdered oxidizable material 3 which generates heat when moistened with water. The pad is not of conventional puffed or pillow shape but is of substantially uniform thickness throughout and is shaped, as viewed in plan, to conform to the article of ap-

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parel in which it is to be used. The illustrated embodiment of the invention is a foot warmer to be placed within a shoe or secured to the shoe as an outer sole, and the outline of the pad is therefore that of a foot or shoe sole.

The casing for the heating pad 1 is of laminated construction, the outer layers 4, 4' at opposite sides of the casing being of a relatively stiff form-retaining material to which the adjacent layers 5, 5', respectively, of asbestos are secured by a waterproof cement. The outer layers may be of linoleum with the finished side to the outside, or they may be of a synthetic rubber which will not be detrimentally affected by the heat which is transmitted through the asbestos layers. A recess for receiving the heating pad is provided by cementing an open frame or strip 6 of felt or a cork composition to one of the asbestos plates, for example to the bottom plate 5 as shown in the drawing. The height or thickness of the frame 6 is equal to the thickness of the pad 1 in order that the outer surfaces of the casing may be substantially parallel to each other.

The casing lid, comprising the joined layers 4' and 5', is loosely hinged to recessed section or base comprising the joined layers 4, 5 and the frame or border strip 6, by tapes 7, 7 which are cemented to the outer layers 4 and 4' at one side of the casing. The hinge tapes are secured by cement 8 in shallow grooves in the outer layers 4, 4', the cement being flush with the outer surface to avoid any irregularity in the thickness of the casing. Some form of fastening means is provided at the opposite side of the casing to prevent a sliding or displacement of the lid with respect to the base section. The fastening means may comprise one section 9 of a snap fastener on a tape 10 cemented to the bottom layer 4, and a cooperating snap fastener element 11 countersunk in a recess 12 in the upper surface of the linoleum layer 4' of the casing lid, as shown in Fig. 5. Alternatively, the fastening means may be a band 13 of elastic material, for example of a synthetic rubber which will not be damaged by heating, which is sprung over the edge of the casing to hold the lid tightly to the casing base; see Fig. 6.

The encircling elastic band 13 is preferably employed, in addition to any mechanical fastening of the lid to the body of the case, since it provides a substantially water-tight sealing of the casing. This sealing prevents leakage of water both into and out of the casing and thus enables the user to control the total heat to be

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generated during any one use of the heating pads. Furthermore, any leakage of water from an encased heating pad that is placed in a pocket in apparel, whether a shoe, mitten or other clothing, would result in discomfort, and possibly in danger at low temperatures.

The pads are prepared for use by opening the casings and pouring a measured quantity of water upon the pad or into the lower section of the case, and then closing the lid upon the case and applying the sealing band 13. The total heat to be generated during any one period of use can be controlled, at least approximately, by the quantity of water which is introduced. The chemical heating pads 1 will generally be of larger capacity than to be completely exhausted by one period of use and, when this is the case, the pads should be removed from the casing for cleaning or drying after each use.

The wetted and encased pads are then placed in the shoes or boots as insoles, or are held to the lower surfaces of the shoes by insertion in overshoes or by lacings or straps. It is not necessary to make separate casings for the right and left shoes since the casing are sealed by the elastic band 13 and either the base or the lid side of the casing may be uppermost.

The asbestos layers 5, 5' delay the transfer of heat from the heating pad 1 to the exterior of the casing, and prevent excessive heating of the wearer of the foot warmer and of the shoe sole when the encased heating pad is used as an innersole. The outer layers 4, 4' also serve to delay the heat transmission, but their primary purpose is to afford protection for the asbestos layers which, in general, are preferably of a somewhat friable nature as it is not desirable to employ rigid plates of cemented asbestos fibers. For comfort, the entire casing should be somewhat yielding or flexible.

It is to be understood that the invention is not limited to the foot warmer embodiment which is herein illustrated and described as the heating pad and its casing may be shaped and sized for insertion in an item of apparel other than shoes. When the encased heating pads are to be placed in pockets of clothing at a body joint,

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for example at a wrist or knee joint, it is not essential that the outer layers of the casing be relatively stiff and form-retaining. For such uses, the outer layers of the casing may be relatively flexible but of a character and/or shape which permits an effective water-tight sealing of the casing by an elastic sealing band 13 or equivalent means.

I claim:

10 1. An encased heating assembly comprising a casing including a base section and a lid, said base section and lid each comprising an outer water-tight layer and an inner asbestos layer cemented thereto, a strip cemented to the border of the asbestos layer of the base section to provide a recess, a chemical heating pad within said recess of the base section, and means for hermetically sealing the said lid to said base section.

20 2. An encased heating assembly as recited in claim 1, in combination with means hinging said lid upon said base section of said casing.

25 3. An encased heating assembly as recited in claim 2, in combination with means for mechanically securing said hinged lid against displacement with respect to said base section of the casing.

30 4. An encased heating assembly as recited in claim 1, wherein said sealing means comprises an elastic band arranged over and spanning the junction of said base section and lid of said casing.

35 5. An encased heating assembly as recited in claim 1, wherein said base section and lid of the casing are of foot shape, whereby said heating assembly is adapted for use as a foot warmer.

40 6. An encased heating assembly as recited in claim 1, wherein said heating pad is of substantially uniform thickness throughout, and of substantially the thickness of said recess-forming strip.

45 7. An encased heating assembly as recited in claim 1, wherein the outer surfaces of said base section and said lid are substantially parallel to each other.

No references cited.