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2,569,138

ELECTRICALLY HEATED MATTRESS PAD

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2 Sheets-Sheet 1

FIG. 1

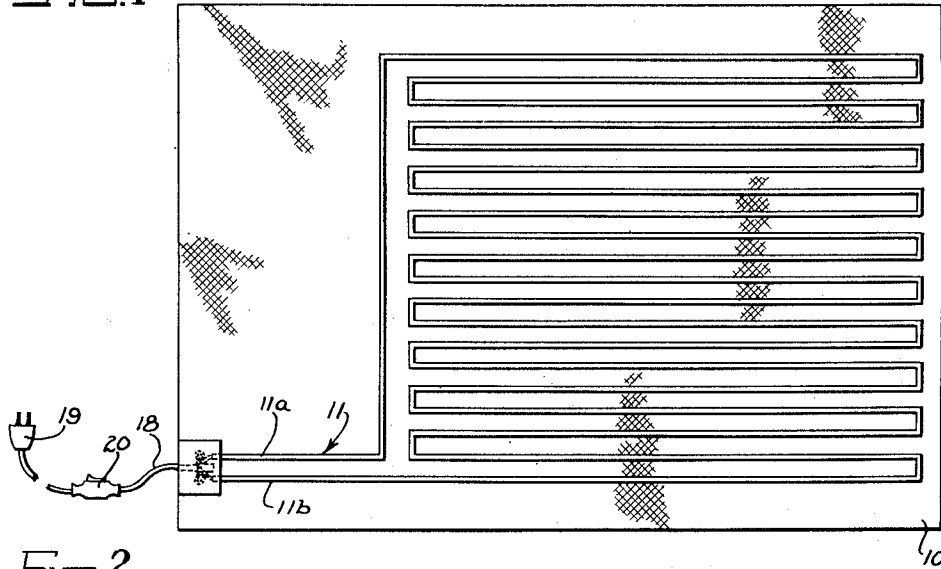


FIG. 2

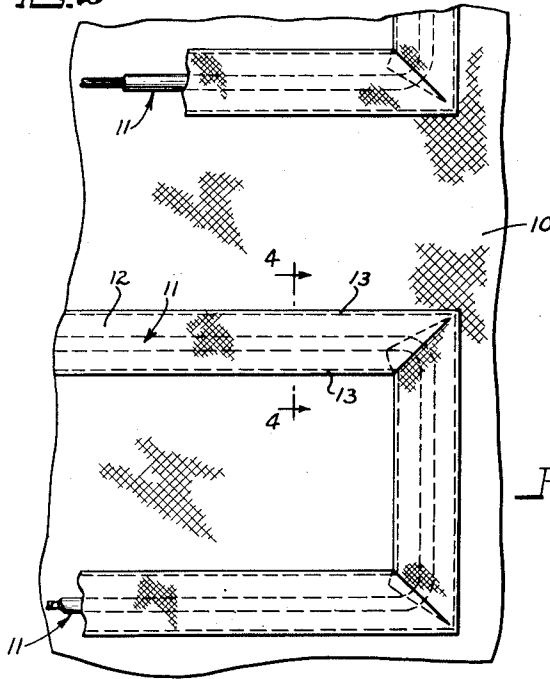


FIG. 3



FIG. 4

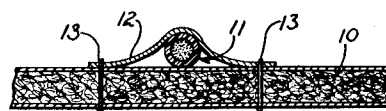
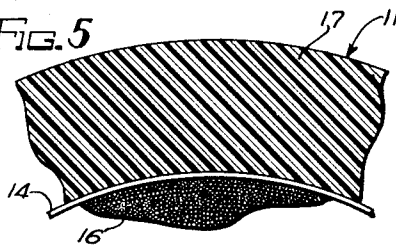


FIG. 5



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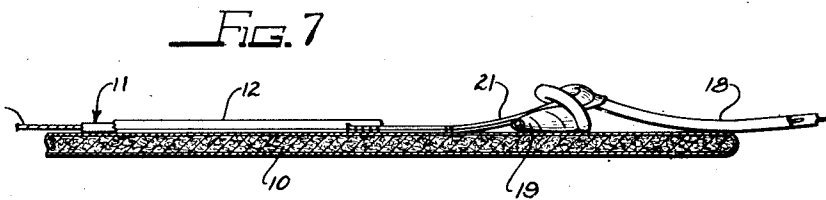
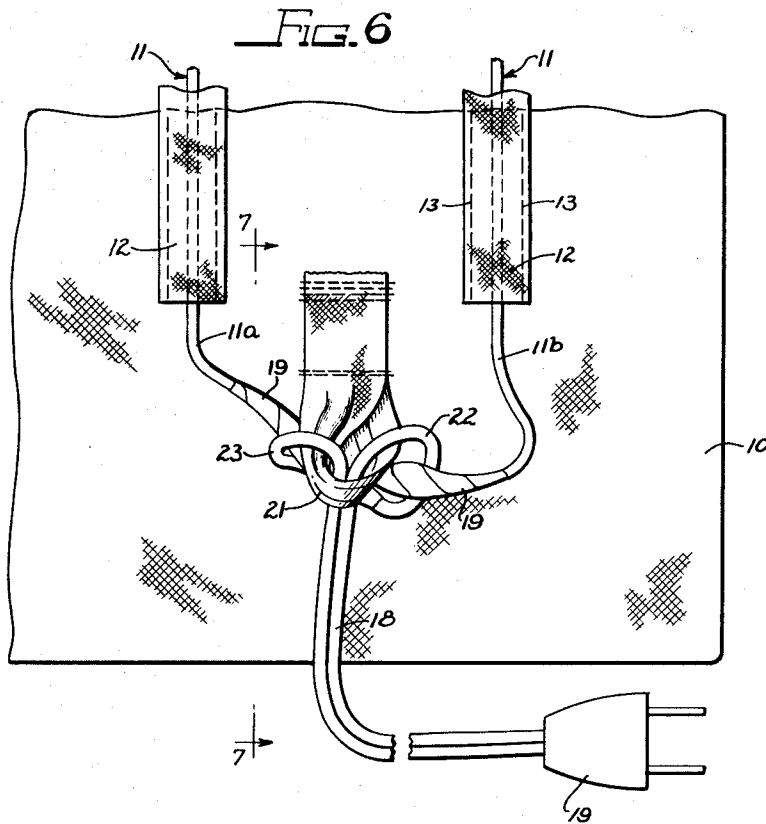
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## ELECTRICALLY HEATED MATTRESS PAD

Howard C. Abbott, Chicago, Ill.

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1 Claim. (Cl. 219—46)

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My invention relates to an electrically heated mattress and sleeping pad.

The use of electrically heated blankets, comforters and other coverings, and also, electric heating mattresses is known. Each of these articles, however, has inherent disadvantages which prevent its use in a most efficient and economical manner, as will be hereinafter explained. For example, electrically heated blankets and coverings are intended to be placed over the body of the user and, accordingly, in such position, since heat tends to rise upwardly, most of the heat developed by the covering is dissipated into the surrounding space, thereby resulting in a very inefficient operation. In the case of electrically heated mattresses, the electrical heating element is incorporated into the construction of the mattress and in use, is more efficient than an electrically heated blanket, since the user, when reclining on the mattress, is in the path of the warm air rising upwardly from the heating element within the mattress. However, heretofore a user owning a mattress of the conventional non-heated type and desirous of converting to the heated type was required to dispose of the conventional type mattress and purchase one of the electrically heated type, since there was no way of incorporating a heating element without reconstruction of the mattress. Further, as is well known, it is a common practice to turn over and rearrange mattresses at periodic intervals in order to prevent the formation of pockets or depressions in the areas where the users are most likely to recline. Since the heating element of an electrically heated mattress is disposed adjacent the upper surface thereof, and since, upon reversal of the mattress, the heating element would be more remotely removed from the body of the user, it will be apparent that a mattress of this type could not be or would not be reversed or rearranged at least until after the heating season was passed in order to present the other surface for reclining thereon. Accordingly, undesirable depressions or pockets could form in mattresses of the electrically heated type. It is also well known that mattresses after a period of use may be reconditioned to renew the service life thereof. It will be apparent that an electrically heated mattress containing an electrical heating element would of necessity complicate the reconditioning of such a mattress and, accordingly, would increase the cost of performing such an operation thereon.

With the view to overcoming some of the difficulties and disadvantages above enumerated,

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in accordance with my invention, I provide a mattress pad embodying therein an electrical heating element or heating means, the said pad being adapted to be placed over the top of a conventional mattress and to be removably secured thereon so as to obtain the advantages of an electrically heated mattress, but yet permitting rearrangement and reversing of the mattress as also removal of the mattress pad itself for cleaning or washing.

One of the objects of my invention is the provision of a mattress pad incorporating therein an electrical heating element, the said pad being adapted for use with a conventional mattress and being removably attached thereto.

Another object of my invention is the provision of a heated mattress and sleeping pad which provides a uniform distribution of heat throughout the surface thereof, the heat developed being controlled by the total resistance of the heating element, thus, the use of thermostats is avoided and the pad is rendered safe in use, the hazard of fire resulting from failure of a thermostat to operate, as may occur in heating pads of conventional construction, being entirely avoided.

A further object of my invention is the provision in a heating pad of the type described, of novel and highly simplified means for securing an electrical cord to the pad, whereby any tensile stresses applied to the cord are absorbed in the pad itself and are not transmitted to the heating element, thereby avoiding any liability of displacing the heating element or severing the electrical connection between the heating element and the cord.

A still further object of my invention is the provision of a heating pad of the type described which is extremely simple in construction, economical to manufacture and highly efficient in operation.

Other and further objects and advantages of my invention will become apparent from the following description when considered in connection with the accompanying drawings in which:

Fig. 1 is a top plan view of a heated mattress and sleeping pad in accordance with my invention.

Fig. 2 is a fragmentary plan view, on an enlarged scale, of the pad shown in Fig. 1.

Fig. 3 is an elevational view of the heating element embodied in my invention.

Fig. 4 is a cross-sectional view, on an enlarged scale, taken substantially on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary cross-sectional view, on an enlarged scale, of the heating element illustrated in Fig. 4.

Fig. 6 is a fragmentary plan view, on an enlarged scale, showing the means for absorbing tensile stresses applied to the electrical cord.

Fig. 7 is a cross-sectional view taken on line 7-7 of Fig. 6.

Referring to the drawings wherein is shown a preferred embodiment of my invention, the numeral 10 indicates, generally, a conventional mattress pad, preferably of the quilted type, although it will be understood that the mattress pad may be of any type desired so long as it has some cushioning qualities.

Arranged over one surface of the pad 10 is a flexible electrical heating means as will be presently described. The said heating means is preferably in a continuous length, as shown in Fig. 1, and is arranged in a pattern comprising a series of reversing lines which are spaced in substantially parallel relationship so as to cover approximately three-fourths of the area of the pad. Thus, the head portion of the pad upon which the pillows rest has no heating means, while the major portion of the pad on which an individual would normally recline, is substantially covered with a network of the heating means. While the heating means, is shown as arranged in a reversing line pattern, it will be understood that it may be arranged in any suitable pattern, such as concentric circles, a spiral or any pattern desired.

The heating means comprises an element 11 confined within a retaining pocket which is co-extensive in length therewith, the said pocket being formed by stitching a fabric tape 12 along its longitudinal edges 13 to the pad 10, as shown more clearly in Fig. 4. Thus, the heating element 11 is confined within a pocket and the liability of any portion of the said heating element contacting another portion thereof and short circuiting is entirely avoided, so that even if the insulation of the heating element were injured in some way so as to expose the resistance wire 14 thereof, the retention of the heating element within the pocket would thereby prevent a short circuit.

In applying the heating element 11 to the pad 10, the heating element 11 is arranged under and substantially medially of the tape 12 which is then stitched along its longitudinal edges to the pad. The tape 11 may be stitched in a conventional manner to form mitered squared corners, as illustrated in Fig. 2.

The heating element 11 comprises a resistance alloy wire 14 preferably of a size number 33 American Wire Gage. This wire is wound helically around a fortizan plastic core 16 and both the core 16 and the wire 14 are enclosed in a sleeve 17 which is formed of a thermoplastic coating compound. The wire 14 preferably, has a resistance of three ohms per running foot and develops a maximum temperature of 75° C. The heat developed by the pad is determined by the total resistance of the heating element 11, the length of which is adjusted so as to develop a temperature which is about three degrees above normal body temperature. This condition is true so long as the heat developed can be dissipated into the surrounding space. Thus, under such a condition, the heat of the pad will never exceed the temperature indicated. Should it, however, be desired to increase the temperature developed by the pad, the same may be effected by

using one or more coverings such as a blanket, such coverings of course, providing an insulating medium over the heating element to confine the heat and prevent it from escaping into the surrounding space. Thus, the use of a thermostat to control the heat is entirely eliminated in my pad construction, the temperature actually being controlled by the amount of covering employed by the user. It will be readily apparent that under no circumstances can there be any hazard of fire, since a temperature of sufficiently high degree to ignite the fabric of the pad or the bed clothing cannot be reached. It is to be understood that a thermostat control may be used in the circuit in cases where it is desired to maintain the heat at no higher than body temperature.

The terminal portions 11a and 11b of the heating element 11 each are attached to a terminal of a conventional electrical cord 18 connected to a conventional electrical plug 19. A switch 20 may be connected in the circuit. The joints between the heating element 11 and the cord 18 are suitably spliced in a well known manner and are wrapped with a plastic tape 19, the tape being thereafter suitably bonded so as to effect a water tight covering over the spliced joint. Thus, the pad 10 is rendered washable, since the electrical wires associated therewith are completely waterproofed. The splicing of the electrical resistance element 14 to the cord 18, because of the added bulk, is effected preferably near the head portion of the pad, at a point which would normally be disposed under a pillow.

In order to prevent the inadvertent severance of the spliced joints or the application of any stress to the heating element 11, I have provided an extremely simple, yet effective means for securing the cord 18 to the pad 10 itself, so that any tensile stresses applied to the cord 18 are absorbed by the pad rather than transmitted to the heating element 11. As will be clearly seen by reference to Fig. 6, a short section of fabric tape is stitched to the pad to provide a loop 21. The electrical cord 18 is passed through the loop 21 and the terminal portions of the conductors of cord 18 are bent outwardly, as shown in Fig. 6, to form right and left hand loops 22 and 23, respectively. The terminal end of the left hand loop 23 is passed under the terminal end of the right hand loop 22 and is drawn through the right hand loop 22. Thus, as seen in Fig. 6, the terminal end of the right hand loop 22 is under the left hand loop 23 while the terminal end of the left hand loop 23 is over the right hand loop 22. The terminal ends of the loops 22 and 23 are then spliced to the terminal ends of the resistance wire 14, as hereinbefore described. As will be apparent, any tension on the cord 18 is transmitted through the loop 21 to the pad 10. If increased tension is applied, the loops 22 and 23 formed by the cord 18 tend to reduce in size until they tighten up against the loop 21 which then receives the full stress applied to the electrical cord 18. Upon release of tension on the electrical cord 18, the normal resilience of the conductors and insulators causes the loops 22 and 23 to open to their normally enlarged position as shown in Fig. 6.

In use the pad is merely placed on a conventional mattress to overlie the top surface thereof, and any suitable means such as corner loops or straps may be provided to more securely fasten the pad to the mattress.

## I claim:

An electrically heated mattress pad comprising a pad body formed of cushioning material and adapted to overlie a mattress, an electrical heating element arranged over said pad body to cover substantially not more than three-fourths of the area thereof, said element being confined in a pocket formed by stitching a fabric tape to said pad body, said element comprising an electrical resistance alloy wire wound helically around a plastic core with both wire and core being encased in a water tight sleeve of thermoplastic coating compound, said wire having a resistance of 3 ohms per foot and developing a maximum temperature of 75° C.

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## REFERENCES CITED

The following references are of record in the file of this patent:

## UNITED STATES PATENTS

| Number    | Name          | Date          |
|-----------|---------------|---------------|
| 530,053   | O'Neill       | Nov. 27, 1894 |
| 1,215,610 | Bloomer       | Feb. 13, 1917 |
| 1,447,181 | Richmond      | Mar. 6, 1923  |
| 2,317,189 | Heiser et al. | Apr. 20, 1943 |
| 2,376,902 | Clark         | May 29, 1945  |

## FOREIGN PATENTS

| Number  | Country       | Date          |
|---------|---------------|---------------|
| 400,301 | Great Britain | Oct. 26, 1933 |
| 586,745 | Great Britain | Mar. 28, 1947 |