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J. N. M. HOWELLS
HEAT APPLYING BANDAGE

2,573,791

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Fig. 1.

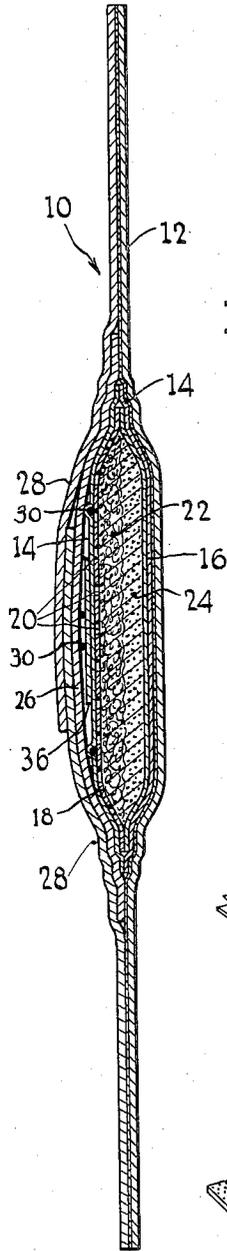


Fig. 2.

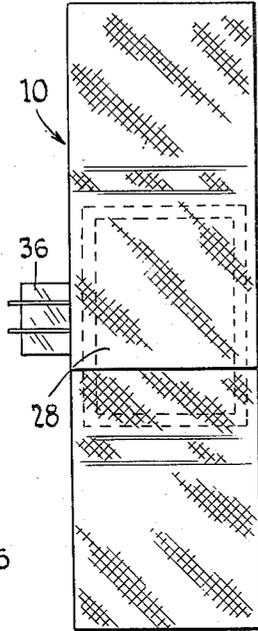


Fig. 4.



Fig. 3.

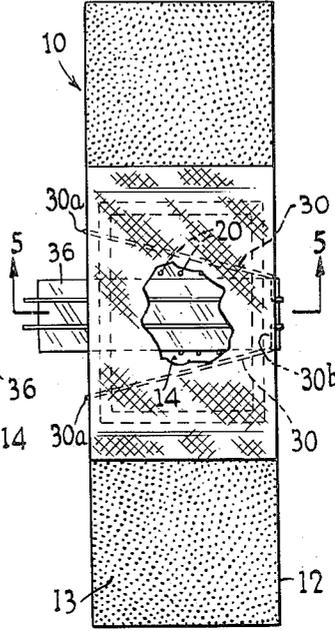


Fig. 6.

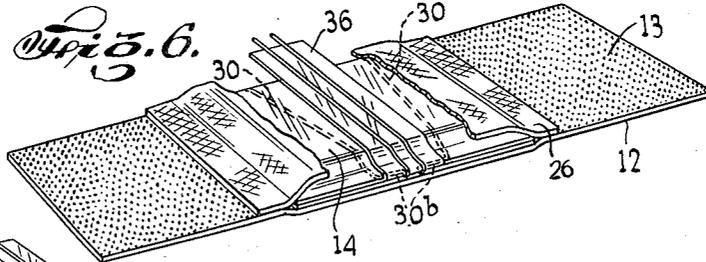


Fig. 7.

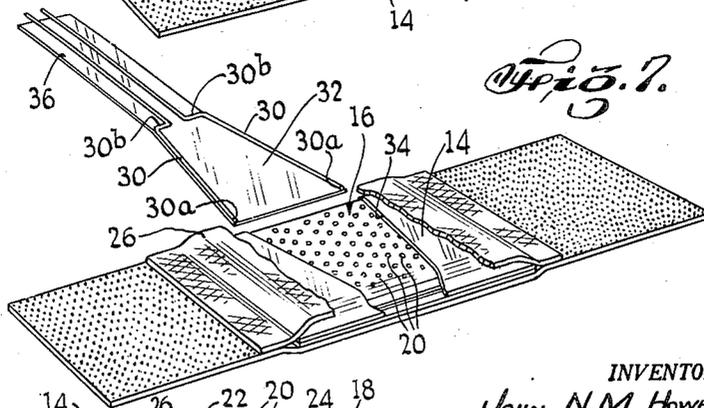
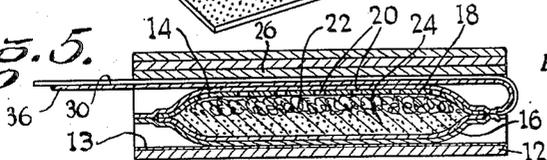


Fig. 5.



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HEAT APPLYING BANDAGE

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2 Claims. (Cl. 128—82.1)

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This invention relates to heat applying bandages.

It is an object of my invention to provide a heat applying bandage which has a self-powered heating means and, therefore, is independent of external sources of energy such as electricity, hot water or heat storage elements.

It is another object of my invention to provide a heat applying bandage which is small and light, and is easy to use.

It is a further object of my invention to provide a heat applying bandage which is highly efficient in operation and whose manufacturing cost is low.

In the drawings, in which is shown one of the various possible embodiments of my invention,

Fig. 1 is a longitudinal sectional view through a heat applying bandage constructed in accordance with the invention;

Fig. 2 is a front view of said bandage as it appears when purchased;

Fig. 3 is a similar view of the bandage after the protective facings have been removed;

Fig. 4 is an edge view of the bandage shown in Fig. 3;

Fig. 5 is an enlarged sectional view taken substantially along the line 5—5 of Fig. 3;

Fig. 6 is a perspective view of the bandage illustrated in Fig. 3 with a portion of the dressing removed to show the self-powered heating means, and

Fig. 7 is a view similar to Fig. 6 with the heating means readied for operation.

In general, I carry out my invention by providing a bandage comprising a layer of flexible material having one adhesive face on which there is secured an enclosure containing an exothermic mixture. The enclosure is covered with a dressing and the dressing in turn covered with a protective facing which also covers the portions of the adhesive layer not overlain by the dressing. The enclosure for the exothermic mixture is imperforate but is provided with means to enable the same to be opened so that said composition can be energized in order to liberate heat.

Referring now in detail to the drawings, 10 denotes a heat applying bandage embodying my invention. Said bandage comprises a layer of flexible material 12 which may be made from fabric and which has one face thereof covered in any conventional fashion with a layer 13 of an adhesive substance, such as is employed for example on surgical adhesive tape. Said layer 12 can be of any configuration, e. g. square, round or cross-shaped, and is illustrated herein as a strip. The central portion of the adhesive surface of the strip 12 supports a closed imperforate envelope 14 made of a flexible impervious

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material which is capable of being torn or ripped without too great an effort. A typical such material is regenerated cellulose (cellophane). Said envelope may be prepared from two sheets of cellophane, having substantially the same contour, except for a tab described hereinafter, the edges of the sheets being secured to each other, as by heat sealing, after the envelope has been filled. The envelope 14 contains an enclosure 16 of impervious insoluble material, e. g. glazed paper or tinfoil, one face 18 whereof is provided with a plurality of through apertures 20. Inside the enclosure 16 next to the perforate face 18 thereof there is disposed a porous body 22 characterized by its ability to permit the passage of water but not pulverulent material. A layer of fibrous material such as cotton batting, felt, or blotting paper will function satisfactorily for the material of said body. A mass 24 of an exothermic mixture is placed between this porous body and the imperforate side of the envelope 16. Said mass may include any well known mixture of chemicals which when wetted with a fluid (preferably water) will generate heat. The following suitable mixtures are given by way of example:

Example I

| | |
|--------------------------|--------|
| | Ounces |
| Potassium chlorate | 1 |
| Cupric chloride | 4 |
| 30 Powdered iron | 20 |

Example II

| | |
|-----------------------------|--------|
| | Ounces |
| Iron | 10 |
| 35 Activated charcoal | 1 |

Example III

| | |
|--------------------------|--------|
| | Ounces |
| Powdered iron | 100 |
| Activated charcoal | 10 |
| 40 Ferric chloride | 1 |

Example IV

| | |
|----------------------------|--------|
| | Ounces |
| Powdered iron | 600 |
| Cupric chloride | 6 |
| 45 Powdered aluminum | 1.5 |

Example V

| | |
|---------------------------|--------|
| | Ounces |
| Powdered aluminum | 15 |
| 50 Cupric carbonate | 1 |
| Barium chloride | 1 |
| Aluminum sulphate | 2 |

Example VI

| | |
|-----------------------------|--------|
| | Ounces |
| 55 Powdered magnesium | 2 |
| Powdered aluminum | 1 |
| Copper acetate | 5 |

The envelope 14 which contains the enclosure 16 having the exothermic composition is secured to the strip 12 by the adhesive layer 13. Said envelope is completely covered by a layer 26 of a suitable dressing material, such for instance as gauze. This layer of dressings extends to both sides of the envelope 14 and the ends thereof are held to the strip 12 by portions of the adhesive layer 13.

To aid in keeping the gauze clean it is protected by a pair of thin facing strips 28 consisting for example of crinoline. Each facing strip is held to an end of the strip 12 by the adhesive layer 13 and the facings are long enough to overlap one another above the dressing 26.

Optionally, the entire bandage may be wrapped in a sealed envelope of some transparent material such as cellophane or glassine.

All of the foregoing exothermic mixtures will be energized to give off heat when treated with water. However, if such mixtures are merely allowed to stand, the moisture in the atmosphere will suffice to cause a slow reaction over an extended period of time and it is for this reason that said mixture is enclosed in the imperforate, impervious envelope 14.

In order to enable water to be applied to the mixture at such time as the bandage is to be used, manually manipulatable means is provided to rip open the envelope 14, as for example by tearing off a portion. Said means as illustrated herein comprises a pair of thin flexible members 30, such as cord strings, arranged in and secured to a side face of the envelope 14. Both strings are located on the inside of the envelope and are adhered to the envelope in any suitable fashion, for example by means of a cementitious compound or by being pressed into the envelope under the proper conditions of heat and pressure to secure the strings thereto. One end 30a of each string is disposed at or near one edge of the envelope 14 which is disposed at a lateral edge of the strip 12. The two strings extend toward the opposite edge of the envelope and converge toward each other as best seen in Figs. 6 and 7. At this opposite edge the strings turn in toward one another as at 30b until they come substantially into contact. From such point the strings turn back toward the first mentioned edge of the envelope, said strings being long enough to extend beyond this edge in order that they may be grasped and pulled.

It will be apparent that upon pulling the strings the same will progressively rip open the portions of the envelope which the strings underlie whereby to pull back a trapezoidal patch 32 and form a corresponding large opening 34 in the envelope through which water may enter. To facilitate pulling of the strings and ripping out of the patch 32, said strings may be secured to a tab 36 integral with and extending from an edge of the envelope 14. This tab is folded back with the strings 30 and forms an integral part of the patch 32 when the same is pulled back.

To use this heat bandage, the tab 36 and strings 30 are pulled until the patch 32 separates from the envelope 14. Then, either before or after the crinoline facings are removed, the central portion of the bandage (or the entire bandage) is dipped in water. The water will penetrate the exposed openings 20 and reach the exothermic mixture 24 where it will start the generation of heat. The pad now may be applied to a patient.

Optionally, the bandages may be furnished to supply different temperatures, this being accomplished either by adding an inert substance such as wood flour or sand to the exothermic mixture 24 or by delaying the reaction. This latter can be accomplished by incorporating the exothermic mixture in a water soluble binder, e. g., carboxymethylcellulose.

It will thus be seen that I have provided a heat applying bandage which achieves the several objects of the invention and is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention and as various changes might be made in the embodiment set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense, but any permissible change which may be effected in the construction disclosed in this application must fall within the purview of the claims asserted therein.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A heat applying bandage comprising an elongated flexible strip having at least the ends thereof provided with an adhesive layer on one face, a dressing located over a portion of said face of the strip intermediate the ends thereof, an impermeable imperforate enclosure disposed between said strip and the dressing, said enclosure containing an envelope of impermeable insoluble material having a perforate portion, a water-activatable dry exothermic mixture within said envelope, and porous means in said envelope underneath the perforate portion to prevent said mixture from leaving the envelope through the perforations.

2. A heat applying bandage comprising an elongated flexible strip having at least the ends thereof provided with an adhesive layer on one face, a dressing located over a portion of said face of the strip intermediate the ends thereof, an impermeable imperforate enclosure disposed between said strip and the dressing, said enclosure containing an envelope of impermeable insoluble material having a perforate portion, a water-activatable dry exothermic mixture within said envelope, and a fibrous mass in said envelope underneath the perforate portion to prevent said mixture from leaving the envelope through the perforations.

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