United States Patent

Kawaguchi

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[45] **Aug. 22, 1972**

[54] **DEFIBRILLATION ELECTRODE PAD AND PACKAGE THEREFOR**

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[52] **U.S. Cl.** .....**206/63.2 R,** 128/417, 206/56 AA, 229/56, 229/66

[51] **Int. Cl.**.....**B65d 81/22,** B65d 31/12, A61b 19/00

[58] **Field of Search**.....206/63.2 R, 56 AA, 56 AB, 47 A; 128/2.06 E, 417

[56] **References Cited**

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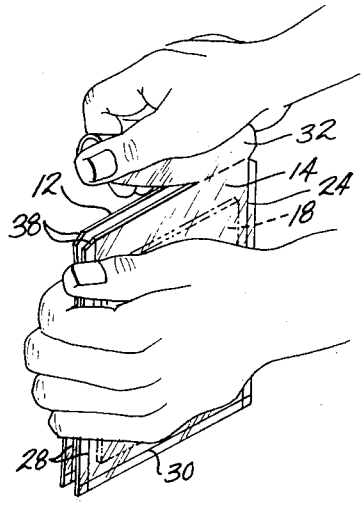
[57] **ABSTRACT**

Absorbent pads soaked with a conductive solution are packaged in moistureproof packages in a manner which assures easy access to the pads under the emergency conditions normally associated with the use of defibrillation equipment. Two separate moistureproof containers in the form of plastic bags are sealed together with each bag containing a soaked pad. The two bags are so arranged and interconnected that the user can easily retrieve the pads for immediate application to the chest of a victim.

5 Claims, 4 Drawing Figures



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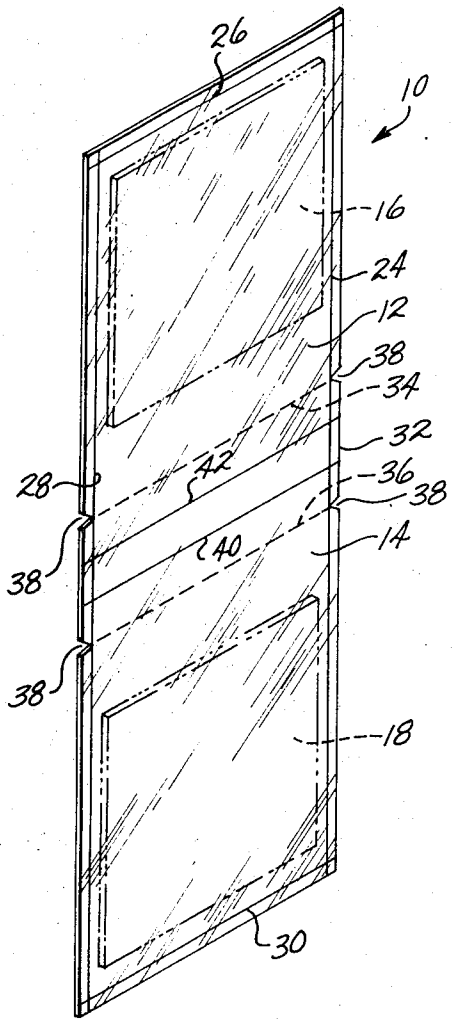


Fig. 1.

Fig. 2.

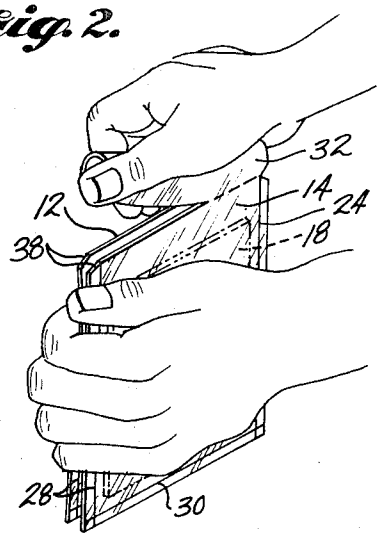
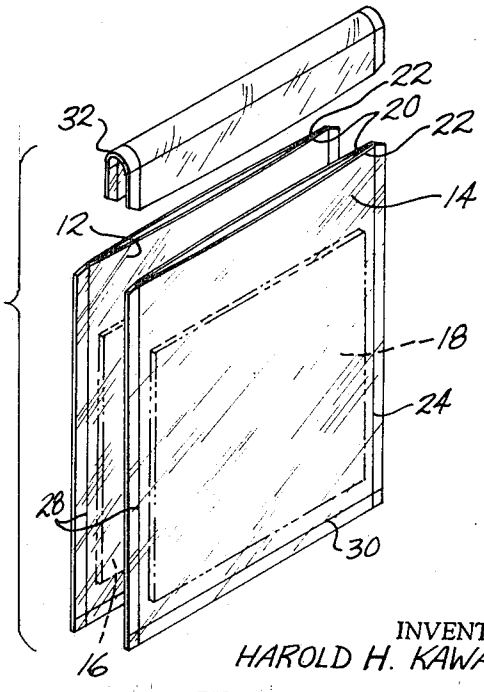


Fig. 3.



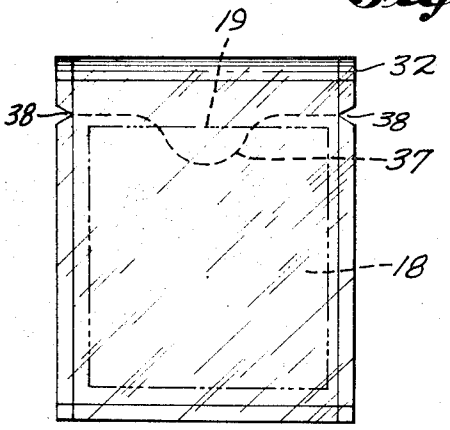


Fig. 4.

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DEFIBRILLATION ELECTRODE PAD AND PACKAGE THEREFOR

Defibrillation equipment of various types is well known at the present time and finds widespread usage in hospitals and is typically carried by emergency rescue vehicles. The defibrillation equipment basically includes a high energy output electric supply together with suitable electrodes for applying a large quantity of electrical energy to the chest of a victim whose heart has gone into fibrillation. In using such equipment it is important that the electrodes made good electrical contact with the chest of the patient so that the stored energy is actually delivered to the victim. Poor electrical contact can result in burning of the skin and also can prevent the application of the desired quantity of electrical energy to the victim.

It is typical in the art of defibrillating a patient to make use of an electrically conductive paste or jelly beneath the electrodes of the defibrillation equipment in order to achieve a low resistance electrical connection. However, such pastes and jellies present a problem in that they typically cause the electrodes to slide about the chest of the patient. When repeated defibrillation signals are required, it is found that the subsequent application of the electrodes to the slippery skin of the patient can present a problem. This is particularly true when the defibrillation is being attempted "in the field" or at a remote location where a person may have suffered the heart disorder. In those cases, as well as in the intensive care units of a hospital, it is extremely important that the defibrillation equipment be placed in operation at the earliest possible time if the life of the patient is to be saved. In order to overcome some of the problems associated with conductive jellies and pastes, pads of absorbent material such as surgical paper or cloth soaked in a saline solution have been utilized beneath the defibrillation electrodes. However a problem has been encountered in that such pads necessitate pre-soaking, which results in limited shelf life of the pads. A saline bath can also be made available so that the personnel using the defibrillation equipment can soak the pads at the time of defibrillating the patient. This of course adds to the time required to actually apply the defibrillation signals to a patient once the patient has been reached. The latter approach is also impractical in those cases where the defibrillation equipment is carried in an emergency vehicle which typically rushes to the scene of a fallen victim, with the personnel typically rushing from the vehicle with the defibrillation equipment in hand in order to apply the defibrillation signals to the victim at the earliest possible moment.

It is therefore an object of the present invention to provide an improved defibrillation electrode pad and package.

Another object of the present invention is to provide a conductive pad assembly for defibrillation equipment with the conductive pad having an extended shelf life and with the package assembly assuring ready removal and separation of two pads.

In accordance with the teachings of the present invention, a pair of pads soaked in a conductive solution are sealed inside of separate plastic bags with the plastic serving to prevent drying of the soaked pads. A saline solution works well for soaking the pads to make them good electrical conductors. Two such bars or

packages are interconnected in a manner which facilitates the immediate removal of each of the pads by the user by tearing the bags at a predetermined location. By having two such separate bags interconnected, the user is always assured of having the required conductive pad for each of the electrode assemblies of the defibrillation equipment typically used at the present time.

The above and additional advantages and objects of the invention will be more clearly understood from the following description when read with reference with the accompanying drawings.

FIG. 1 is an isometric view of a defibrillation electrode pad and package combination according to the invention laid out flat and showing electrode pads contained in pockets of the transparent package with a foldable and removable portion connecting the pockets.

FIG. 2 is an isometric view of the pad and package combination shown in FIG. 1, showing the connecting portion being torn away to open the pockets for access to the pads in accordance with the invention.

FIG. 3 is an isometric view showing the folded connecting portion torn away leaving the pockets open along the severance lines.

FIG. 4 is a side view of another embodiment of the invention, with the package shown folded and having a curved tear line so that when the connecting portion is torn free a portion of the defibrillation pad is directly exposed for ease of removal.

The electrode pad and package combination shown in FIG. 1 consists of a substantially rectangular plastic package **10** having moistureproof pockets **12** and **14** at each end in each of which is contained an electrode pad **16, 18** soaked in a conductive solution, such as a saline solution. The pockets **12** and **14** are formed by opposite walls **20** and **22** bound together by heat or pressure welds along peripheral lines **24** and **26, 28** and **30**. The foldable interconnecting portion **32** is bounded by scored tear lines **34** and **36** extending across the package with notches **38** at the ends of the tear lines to make it easier to start the tear under the emergency conditions surrounding use of the pads. The entire package is preferably constructed of a light plastic transparent material such as polyethylene which maintains its moistureproof character over a reasonably long period of storage time so that the pads are maintained moist for maximum electrical conductivity.

The tear lines **34** and **36** may be formed by the heat or pressure welds defining the separate pockets or bags in which the pads are contained, but it is preferred that separate tear lines be provided to assure that the pockets are left open for immediate removal of the pads, as shown in FIGS. 2 and 3. Thus in the embodiments shown the tear lines **34** and **36** are positioned on opposite sides of weld lines **40** and **42** which extend across the connecting portion **32** and separate the pockets **12** and **14** so that the pads and solution contained therein will not move from one pocket to another. The tear lines **34** and **36** may be made before the package is assembled and do not destroy the waterproof characteristic of the package.

A modification of the tear lines for opening the pockets of the package is shown in FIG. 4 wherein tear line **37** is curved in the center downwardly beyond the

edge of the electrode pad **18**. Thus when the connecting portion **32** is removed the upper edge **19** of the electrode pad **18**, and pad **16** on the opposite side, is exposed for easy gripping and removal of the pad.

The invention therefore provides a simple and easily constructed electrode pad and package combination which enables storage of pre-soaked electrode pads in a convenient manner and quick removal of the pads from the package under the emergency conditions occurring at the time such pads are needed.

What is claimed is:

1. A defibrillation electrode pad and package combination comprising:

a. a foldable package having two watertight pockets and a connecting portion therebetween;

b. said connecting portion being bendable along a transverse line whereby said package can be folded so that the pockets lie against one another;

c. said package further having a transverse tear line across each of said pockets and parallel to said transverse fold line whereby when folded said connecting portion can be torn away along said tear lines to open said pockets simultaneously; and

d. a defibrillation electrode pad soaked in an electrically conductive solution contained in each of said pockets.

2. A defibrillation electrode pad and package combination comprising a package having two watertight pockets and a connecting portion therebetween, said connecting portion being bendable along a transverse line and scored on each side of said transverse line whereby said pockets can be separated and opened simultaneously by tearing across said connecting portion, and a defibrillation electrode pad held in a conductive solution in each of said pockets.

3. The combination of claim **2** wherein said connecting portion is scored along parallel lines intersecting the respective pockets and is foldable between said lines so that said pockets lie flat against one another and said connecting portion is thereby positioned along one edge of the package to be gripped and torn away to open said pocket simultaneously.

4. The combination of claim **3** wherein said package is formed of plastic walls welded together along peripheral lines defining said pockets, and wherein a weld line extends across said connecting portion between said score lines.

5. The combination of claim **4** wherein said score lines extend across an edge of the electrode pad contained in each pocket whereby said pads are exposed for gripping when said connecting portion is removed.

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