We, BECTON DICKINSON AND COMPANY, a company organized and existing under the laws of United States of America of 70 Centre Drive, Paramus, New Jersey 07652, United States of America, hereby apply for the grant of a Standard Patent for an invention entitled "COLD APPLICATION AND COMPRESSION BANDAGE"

which is described in the accompanying complete specification.

DETAILS OF BASIC APPLICATION(S):

Number of basic application: 276,428
Name of Convention country in which basic application was filed: United States of America
Date of basic application: 22 June 1981.

Our address for service is:

F.B. RICE & CO.,
101 Mort St,
Balmain N.S.W. 2041

Dated this 16th day of March 1982.

BECTON DICKINSON AND COMPANY

By: Patent Attorney

TO: The Commissioner of Patents
COMMONWEALTH OF AUSTRALIA

APPLICATION ACCEPTED AND AMENDMENTS ALLOWED 30 May 1986

LODGED AT SUB-OFFICE
17 MAR 1982

COLD APPLICATION AND COMPRESSION BANDAGE
BACKGROUND OF THE INVENTION

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425-11-2
DECLARATION IN SUPPORT OF AN APPLICATION FOR A CONVENTION APPLICATION FOR A PATENT ON INVENTION

In support of the Convention Application made by BECTON, DICKINSON AND COMPANY for a patent for an invention entitled:

COLD APPLICATION AND COMpressive BANDAGE.

We, Tim Hale Gordon and Mark Zabrowsky, Engineer and Manager respectively of and care of the applicant company do solemnly and sincerely declare as follows:

**We are authorised by the applicant for the to make this declaration on its behalf.

**The basic application(s) as defined by section 141 of the Act was made in United States of America on 22 June 1981 by Tim Hale Gordon and Mark Zabrowsky.

**I am the actual inventor of the invention.

Tim H. Gordon, of 101 Mt. Vernon St. Rodgefield Park, New Jersey
Mark Zabrowsky of 129 Tracy Place, Hackensack, New Jersey.

**I am entitled to make the application are as follows:

The applicant is a person who would if a patent were granted upon an application made by the actual inventors be entitled to have the patent assigned to it under the provisions of Section 34(1)(fa) of the Act.

**The basic application(s) referred to in paragraph 2 of this Declaration is/are the first application(s) made in a Convention country in respect of the invention the subject of the application.

Declared at Paramus, N.J. this 19th day of April, 1982.

To: The Commissioner of Patents, Commonwealth of Australia.

This Form is suitable for any type of Patent Application. No legalization required.

Claim

1. A bandage for the simultaneous application of cold therapy and compression comprising:
   an elongated strip of elastic material adapted to be wrapped around a portion of a user's body;
   a pocket in one end of said strip with an opening at the terminal end of said strip providing access to the interior of the pocket;
   a refrigerant pack removably placed inside said pocket, said pack including an extension tab projecting outwardly through said opening and adapted to be grasped by the user during wrapping of the bandage; and
   means for retaining said pack inside said pocket during use.
COMMONWEALTH OF AUSTRALIA

Patent Act 1952

COMPLETE SPECIFICATION

(ORIGINAL)

Class Int. Class

Application Number : 81601/82.
Lodged :

Complete Specification Lodged :
Accepted :
Published :


Related Art :

Name of Applicant : BECTON DICKINSON AND COMPANY.

Address of Applicant : Mack Centre Drive,
Paramus, New Jersey 07652,
UNITED STATES OF AMERICA.

Actual Inventor : TIM H. GORDON
MARK ZABROWSKY.

Address for Service : F.B. RICE & Co.,
Patent Attorneys,
The Forth and Clyde,
101 Mott Street,
BALMAIN. 2041.

Complete Specification for the invention entitled:
"COLD APPLICATION AND COMPRESSION BANDAGE"

The following statement is a full description of this invention including the best method of performing it known to us:
COLD APPLICATION AND COMPRESSION BANDAGE

BACKGROUND OF THE INVENTION

1. Field of the Invention. The present invention relates to an elastic bandage, and more particularly, concerns an elastic bandage for the simultaneous application of cold therapy and compression during use.

2. Description of the Prior Art. Cold therapy is oftentimes recommended, particularly when a limb of a person has been injured. In many instances merely holding an ice bag against the injured portion may be sufficient. On the other hand, the mere manual application of an ice bag to the injury does not include the therapeutic benefits of compression. Furthermore, holding the ice bag in place by hand is inconvenient.

A therapeutic elastic bandage described in U. S. Patent No. 3,900,035 represents a recent attempt to overcome the deficiencies of manual ice bag application. Since the patented product uses an elastic bandage, the benefits of compression, along with cold therapy application, are said to be achieved. However, some problems still exist in the type of bandage described in U. S. Patent No. 3,900,035. In particular, in applying the bandage to the person's limb, the cold pack area would have to be grasped. If the wrap is difficult to complete, holding the cold pack area for a long period of time might induce some discomfort. Also, in the patented bandage, insertion and removal of the multiple cold packs is time consuming. Further, in applying the bandage described in the aforementioned patent, the stretch of the elastic material increases the spacing between the individual cold packs thereby creating a discontinuous cold application surface. Therefore, it can be seen that further improvements in this type of therapeutic elastic bandage are still being sought.

U. S. Patent No. 3,822,705 describes a refrigerant wrap which could be applied under compression to the area of injury. However, this patent suffers from the same de-
ficiencies as the bandage described in the previously dis-
cussed patent.

SUMMARY OF THE INVENTION

The bandage of the present invention is adapted for
simultaneous application of cold therapy and compression,
particularly to a portion of a user's body. The bandage
comprises an elastic material for wrapping around a portion
of the body. A refrigerant pack includes tab means thereon.
The refrigerant pack is removably held on said material
during use so that the tab means is accessible for grasping
by the user.

In a preferred embodiment of the present invention, the
bandage includes an elongated strip of elastic material.
There is a pocket in one end of the strip with an opening
at the terminal end thereof. A flexible refrigerant pack
is removably placed inside the pocket, with the pack in-
cluding a tab projecting outwardly through the opening. At
least two operable fasteners are on the terminal end of the
strip spaced sufficiently apart from each other to allow
the tab to project therebetween when the fasteners are
closed and to retain the pack inside the pocket during use.

In accordance with the principles of the present in-
vention, the tab provides a convenient grasping mechanism
for the user particularly during wrapping of the bandage
around a portion of the body. In addition to allowing the
user a facilitated mechanism for wrapping, the present in-
vention also eliminates the need for the user to actually
grasp the cold area of the bandage during the wrapping pro-
cedure. In addition, by placing the grasping tab on the
refrigerant pack, and not on the bandage, the unwieldy
attachment problems are solved. Furthermore, it facilitates
the fabrication of the present invention, from the stand-
point of expense and equipment, to place the grasping tab
on the refrigerant pack rather than on the bandage. This
becomes especially evident when the refrigerant pack is
required to be removed from the bandage after its refrigerant
properties dissipate during use. The grasping tab allows the user to readily pull the refrigerant pack out of the bandage without having to fumble with the refrigerant pack if no tab were included. Another advantage is gained by having the grasping tab on the cold pack: by holding the tab, the user prevents any possible migration of the cold pack within the bandage pocket. Of course, the present invention desirably provides for the simultaneous application of cold therapy and compression during its use.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a perspective view illustrating the preferred embodiment of the bandage of the present invention; Fig. 2 is a top plan view of the pouch portion of the bandage of Fig. 1 illustrating the insertion or removal of the refrigerant pack therefrom; Fig. 3 is a cross-sectional view of the invention taken along line 3-3 of Fig. 1; Fig. 4 is a cross-sectional view of the invention taken along line 4-4 of Fig. 1; Fig. 5 is a top plan view of the preferred refrigerant pack of the present invention; Fig. 6 is a side view of the refrigerant pack of Fig. 5; and Fig. 7 is a perspective view of the bandage of Fig. 1 during the wrapping procedure around a limb of a user.

**DETAILED DESCRIPTION**

While this invention is satisfied by embodiments in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as exemplary of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be measured by the appended claims and their equivalents.

Adverting to the drawings, and Figs. 1-4 in particular, there is illustrated the preferred embodiment of the bandage,
10 of the present invention. Bandage 10 is comprised of three major components: a preferably elongated strip of elastic material 12, a removable refrigerant pack 14 and a fastener assembly 16 for retaining the pack inside the pocket during use and for allowing the pack to be removed when necessary.

Elastic strip 12 is preferably significantly longer in its longitudinal dimension than its width so that it may be properly wrapped around a portion of the user's body. Typically, in its relaxed condition, the elastic strip of material may be about 36 inches (90 cm.) long by about 6 inches (15 cm.) wide. Of course, these dimensions are merely for illustration only and can be varied. The elastic strip of material is preferably fabricated with elastic stretch yarns which are interwoven into the material. One such material which may be used for the present invention is the ACE® brand elastic bandage (ACE is a registered trademark of Becton, Dickinson and Company, Paramus, New Jersey).

At one end of strip 12 a pocket 18 is formed. One convenient manner to form pocket 18 is to overlay the strip 12 with a shorter piece of similar material and sew the two pieces of material together. This embodiment is illustrated in the drawings wherein three sides of the overlying material are sewn along edges 19, 20 and 21, respectively. The fourth edge, at the terminal end of strip 12 is left unsewn so that it forms an opening 22 at such terminal end. Opening 22 thus provides access to the interior of pocket 18. In forming pocket 18, while it is preferable to employ elastic material for compatibility with the strip of elastic material, it is not essential for the functioning of the present invention. It is also to be understood that the pocket itself is merely a preferred embodiment since the refrigerant pack need not be completely enclosed when it is wrapped around the portion of the user's body. However, complete enclosure, except for the projecting tab, presents a neater appearance while also serving to absorb any moisture,
caused by condensation, which may appear on the exterior of the refrigerant pack during use. Inasmuch as the refrigerant pack itself should have a large surface area, it is preferred that pocket 18 also be somewhat elongated so as to be longer in its longitudinal dimension than its width dimension.

With reference to refrigerant pack 14, Figs. 5 and 6 illustrate the configuration of the preferred embodiment of such refrigerant pack. This pack includes a body portion 24 which is typically a sealed, flexible enclosure for the refrigerant material 25 inside. Refrigerant pack 14 is typical to those packs described in U. S. Patent Nos. 3,780,537 and 3,885,403. Generally speaking, the enclosure for the refrigerant pack may be a rugged but flexible plastic material; the refrigerant material may be propylene glycol or any other material which is commonly known to serve as a freezing point depressant. It is desirable that both the refrigerant and the enclosure material for the refrigerant pack remain flexible even at cold temperatures. To this end, the refrigerant material should maintain a soft, gel-like consistency over a temperature range of about -20°C to +21°C.

With respect to the size of refrigerant pack 14, it is preferred that there be as large a surface area as is compatible with wrapping around a limb of a person. Both refrigerant pack 14 and pocket 18 should be sized so that the refrigerant pack can be inserted into the pocket through opening 22, and preferably be completely enclosed by the pocket, except for the projecting tab.

As illustrated in the drawings, there is an extension tab 26 projecting from one end of the refrigerant pack. Tab 26 is preferably positioned so that it extends along the longitudinal axis of the refrigerant pack, as more clearly seen by referring to Fig. 5. Furthermore, and especially when enclosure 24 of the refrigerant pack is a plastic material, extension tab 26 may be integrally formed with
enclosure 24 during its fabrication. Of course, if it is not so integrally formed, extension tab 26 may be secured to the refrigerant pack by adhesives, melting operations, or other suitable attachment mechanisms.

In preparation for use refrigerant pack 14 is placed inside pocket 18 so that extension tab 26 projects outwardly through opening 22 as more clearly seen in Fig. 1. Although pocket 18 completely encloses the refrigerant pack once it is placed inside, a retention mechanism is provided with respect to opening 22 so that the refrigerant pack cannot be pulled out of the pocket when the extension tab is grasped by the user during the wrapping procedure. In the embodiment being described, and as more clearly seen by referring to Figs. 1, 2 and 4, a pair of snap fasteners 15, 16 is provided at opening 22. These snap fasteners allow the opening 22 to be readily opened and closed for repeated usage. The snap fasteners are spaced sufficiently apart from each other so that extension tab 26 projects therebetween when the fasteners are closed. When the refrigerant pack is inside the pocket and the snap fasteners are closed, pulling on the extension tab will cause the shoulder portions 28 of the refrigerant pack (as seen in Fig. 2) to come in contact with the snap fasteners. This serves as an abutment stop to prevent the refrigerant pack from being pulled out of the pocket by the normal grasping of the extension tab during use of this invention. It is appreciated that the snap fasteners can be opened to allow the refrigerant pack to be removed for re-freezing or for the insertion of a different refrigerant pack. It is also appreciated that the snap fasteners as described with the embodiment herein are merely one choice of a retention mechanism for holding the refrigerant pack in proper position. Other fastening means may also be employed such as, but not limited to, zippers, safety-pins, clamps, VELCRO fasteners and the like.

These fasteners should be operable so as to be readily opened and closed by the user with little or no inconvenience.
There should preferably be a fastener associated with opening 22 so that an effective abutment stop is provided on each side of tab 26 in shoulder regions 28 of the refrigerant pack. However, it is appreciated that a single fastener on only one side of the tab would be sufficient to hold the refrigerant pack in place during use.

Turning now to Fig. 7, bandage 10 is illustrated during the wrapping procedure around a portion of a user's leg L. It can be seen that the user grasps extension tab 26 as he is positioning the bandage in position on a portion of leg L. Bandage 10 includes a cold refrigerant pack inside pocket 18 for purposes of cold therapy and compression. While holding extension tab 26, the cold pack region of bandage 10 is applied first to the area of injury on leg L. Elongated strip of elastic material 12 is then stretched and wrapped around leg L and over the refrigerant pack region. Usually, elongated strip 12 has sufficient original length and stretch to be wrapped a number of times around the leg. Various clamps, pins, fasteners and the like may then be employed to secure the bandage in position after wrapping is complete. The bandage then remains in place while delivering both cold therapy and compression to the site of wrap. Under normal conditions, the refrigerant pack will retain its cold temperatures for approximately thirty minutes. When the refrigerant pack is no longer cold, the elastic bandage is removed from the body portion being treated. Thereafter, the refrigerant pack would be removed from the pocket of the bandage and then returned to the freezer for subsequent refrigeration. Of course, the bandage of the present invention can then be re-used repeatedly in this manner.

As illustrated in Fig. 7, the extension tab not only allows the user to positively grasp the end of the bandage for wrapping, but also keeps the user's hand off the cold area of the bandage during the wrapping procedure. Thus, the present invention provides a bandage for the simultaneous
application of cold therapy and compression which is easily wrapped around a body portion of the user in a fashion which is more convenient than previously known therapeutic cold bandages.
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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A bandage for the simultaneous application of cold therapy and compression comprising:
   an elongated strip of elastic material adapted to be wrapped around a portion of a user's body;
   a pocket in one end of said strip with an opening at the terminal end of said strip providing access to the interior of the pocket;
   a refrigerant pack removably placed inside said pocket, said pack including an extension tab projecting outwardly through said opening and adapted to be grasped by the user during wrapping of the bandage; and
   means for retaining said pack inside said pocket during use.

2. The bandage of Claim 1 wherein said pack is made from flexible material.

3. The bandage of Claim 2 wherein the pack has a refrigerant material sealed therein which has a soft, gel-like consistency over a temperature range of about -20°C to +21°C.

4. The bandage of Claim 2 wherein said tab is integrally formed with said pack material.

5. The bandage of Claim 1 wherein said means for retaining includes at least two fasteners on the terminal end of said strip spaced sufficiently apart from each other to allow said tab to project therebetween when said fasteners are closed.

6. The bandage of Claim 5 wherein said fasteners are snap-type fasteners adapted to be readily opened and closed for repeated usage.
7. A bandage for the simultaneous application of cold therapy and compression comprising:
   an elastic material for wrapping around a portion of a user's body;
   a refrigerant pack including tab means thereon; and
   means for removably holding said pack on said material during use so that said tab means is accessible for grasping by the user during wrapping of the bandage.
8. The bandage of claim 7 wherein said means for holding includes a pocket into which said refrigerant pack is removably placed.
9. The bandage of claim 7 wherein said tab means extends beyond a terminal end of said material.

10. A bandage for the simultaneous application of cold therapy and compression comprising:
    an elongated strip of elastic material adapted to be wrapped around a portion of a user's body;
    an elongated pocket in one end of said strip with an opening at the terminal end of said strip;
    a refrigerant pack adapted to be flexible over a temperature range of about -20°C to +21°C removably placed inside said pocket, said pack including an integrally formed tab projecting outwardly through said opening and adapted to be grasped by the user during wrapping of the bandage; and
    at least two operable fasteners on said terminal end of said strip spaced sufficiently apart from each other to allow said tab to project therebetween when said fasteners are closed and to retain said pack inside said pocket during use.

DATED this 12th day of March 1986

BECTON DICKINSON AND COMPANY
Patent Attorneys for the Applicant:

F.B. RICE & CO.
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CKINSON AND COMPANY
orneys for the

& CO.
"COLD APPLICATION AND COMPRESSION BANDAGE"

The following statement is a full description of this invention including the best method of performing it known to us:
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These fasteners should be operable so as to be readily opened and closed by the user with little or no inconvenience.
e readily no inconvenience. Thus, the present invention provides a bandage for the simultaneous area of the bandage during the wrapping procedure.