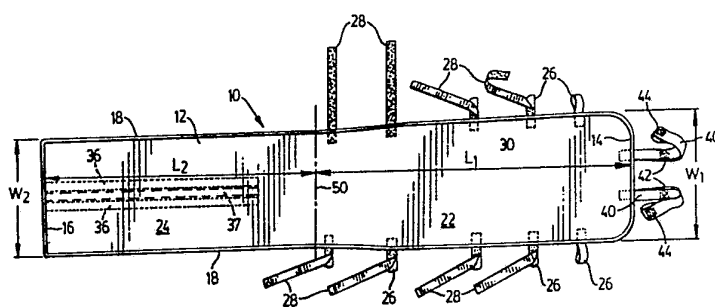




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : A61G 1/003	A1	(11) International Publication Number: WO 91/18576 (43) International Publication Date: 12 December 1991 (12.12.91)
<p>(21) International Application Number: PCT/CA91/00180</p> <p>(22) International Filing Date: 28 May 1991 (28.05.91)</p> <p>(30) Priority data: 530,193 29 May 1990 (29.05.90) US</p> <p>(71)(72) Applicant and Inventor: MURPHY, Wendy, Jane [CA/CA]; 48 Southvale Drive, Toronto, Ontario M4G 1G3 (CA).</p> <p>(74) Agents: HANLEY, Lewis, E. et al.; Fetherstonhaugh & Co., Suite 2300, 439 University Avenue, Toronto, Ontario M5G 1Y8 (CA).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent).</p> <p>Published With international search report.</p>

(54) Title: PATIENT EVACUATION ENVELOPE



(57) Abstract

An evacuation sheet (10) as provided in the form of a longitudinally elongated web (12) as can be folded along a fold line (50) that extends transversely of the width thereof to form an envelope. Binding straps (28) are provided which serve to secure the two lengths of the web (12) in the face to face relationship and handles (26) are provided which facilitate the lifting of the envelope. A first portion of the web (12) is inserted lengthwise under a bedridden patient and then the second length is folded over the first length and secured in the face to face relationship by means of the binding straps (26). The patients can then be lifted from the bed using the lifting handles (26). Handles (40) are also provided at the end remote from the closed end of the envelope which may be used for the purposes of lowering the patient down an incline.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	ES	Spain	MG	Madagascar
AU	Australia	FI	Finland	ML	Mali
BB	Barbados	FR	France	MN	Mongolia
BE	Belgium	GA	Gabon	MR	Mauritania
BF	Burkina Faso	GB	United Kingdom	MW	Malawi
BG	Bulgaria	GN	Guinea	NL	Netherlands
BJ	Benin	GR	Greece	NO	Norway
BR	Brazil	HU	Hungary	PL	Poland
CA	Canada	IT	Italy	RO	Romania
CF	Central African Republic	JP	Japan	SD	Sudan
CG	Congo	KP	Democratic People's Republic of Korea	SE	Sweden
CH	Switzerland	KR	Republic of Korea	SN	Senegal
CI	Côte d'Ivoire	LI	Liechtenstein	SU	Soviet Union
CM	Cameroon	LK	Sri Lanka	TD	Chad
CS	Czechoslovakia	LU	Luxembourg	TG	Togo
DE	Germany	MC	Monaco	US	United States of America
DK	Denmark				

PATIENT EVACUATION ENVELOPEBackground of Invention

This invention relates to evacuation devices for evacuating bedridden patients from a hospital or the like.

In the event of an emergency in a hospital or the like, when it is necessary to evacuate bedridden patients, considerable difficulty has been experienced in removing the bedridden patients from a floor of a hospital which is to be evacuated. Generally, it requires at least two members of the hospital staff to lift a bedridden patient from a bed and to position the patient on a rescue stretcher. Because of the large number of rescue stretchers which would be required to evacuate many hospitals, the cost involved in maintaining a stretcher for each bed would be exceedingly high.

U.K. Patent No. 1,536,191 discloses a rescue bag which can be used to rescue an injured or unconscious person. The rescue bag includes a base portion and a cover portion connected together by suitable slide fasteners. In one embodiment, the cover is attached to the base along a short portion of the side edge thereof. In another embodiment, the cover and base portion are split lengthwise from the lower end thereof. A securing harness is provided on the base portion which is used for the purposes of securing a patient thereon. This structure is a complex structure and it is not well suited for use in attempting to evacuate a bedridden patient because it is not designed to facilitate the sliding of the base portion under a patient that is lying on a bed.

German Patent No. 2,418,374 which issued to Manfred Kufahl. This patent discloses a structure in which a blanket is attached to a stretcher by straps that connect an edge of the blanket to the stretcher. The blanket is fitted with harness straps which serve to secure the patient with respect to the assembled blanket and stretcher.

Summary of Invention

It is an object of the present invention to provide a simple and inexpensive evacuation sheet which is adapted to form an evacuation envelope for use when evacuating bedridden patients from a hospital bed or the like.

- 2 -

It is a further object of the present invention to provide an evacuation sheet which can be stored in a compact-coiled configuration.

It is yet another object of the present invention to provide an evacuation sheet which will slide easily underneath a bedridden patient.

It is a still further object of the present invention to provide an evacuation sheet which is longitudinally elongated and can be folded upon itself to form a closed end of an evacuation envelope surrounding a patient in use.

It is a still further objection of the present invention to provide binding straps that serve to secure the overlying portion of the evacuation envelope with respect to the underlying portion to form a body-accommodating evacuation envelope.

According to a still further aspect of the present invention, there is provided an evacuation sheet which has a length which is equal about twice the height of the patient to be evacuated thereby.

According to one aspect of the present invention, there is provided an evacuation sheet adapted to form an evacuation envelope for use when evacuating bedridden patients from a hospital bed or the like comprising; a web of flexible material having; a first end, a second end and a longitudinally elongated body extending therebetween, and a pair of oppositely disposed side edges and a width extending between the side edges, a first portion of said web extends inwardly from the first end and a second portion extends inwardly from the second end, the first and second portions each having a length that is about equal to the height of the patient that is to be accommodated therebetween in use, said web being foldable across the width thereof to locate the first portion in an overlying relationship with respect to the second portion to form an evacuation envelope that is proportioned to accommodate the body of the patient and which is closed at one end, binding means for releasably connecting the side edges of the first and second

- 3 -

portions of the web to retain said first portion in said overlying relationship, and handle means attached to the first portion to permit the envelope to be lifted to carry a patient therein.

Brief Description of the Drawings

Figure 1 is a plan view of an evacuation sheet constructed in accordance with an embodiment of the present invention.

Figure 2 is a pictorial view of the evacuation sheet of Figure 1 in a folded configuration.

Figure 3 is an enlarged detail showing the manner in which the handles and binding straps are attached to the evacuation sheet.

Figure 4 is a pictorial view illustrating the manner in which the sheet may be formed into a coil to provide a compact storage configuration.

Figure 5 is a diagram illustrating the manner in which the sheet may be caused to pass under a bedridden patient.

Figure 6 shows the evacuation sheet in an assembled configuration.

Figure 7 illustrates the manner in which the evacuation envelope may be used.

With reference to Figure 1 of the drawings, the reference numeral 10 refers generally to an evacuation sheet constructed in accordance with the embodiment of the present invention which is suitable for use in forming the evacuation envelope which is illustrated in Figure 2 of the drawings and is generally identified by the reference numeral 20. The evacuation sheet 10 consists of a web 12 which is made from a sheet of fire retardant fabric. A suitable material for this purpose is available from Bruin Plastics Company Inc. and is identified by the Trade-mark ES100. This material is a laminate which consists of a backing web of vinyl and a polyester film such as Mylar (TM), the polyester film being impregnated with aluminum. The metalized inner face of the fabric acts as a heat reflector that serves to reflect body heat back to the patient

- 4 -

and this serves to reduce the rate at which the patient loses body heat.

The web 12 has a first end 14, a second end 16 and a pair of oppositely disposed side edges 18. The web 12 has a first portion 22 which extends from the first end 14 to about the centre of the length of the web. The first portion has a length L1. The second portion 24 extends inwardly from the second end 16 and has a length L2. The overall length of the web (L1 plus L2) is about equal to twice the height of the patient that is to be accommodated therebetween in use usually about 12 ft. Generally, however, the overall length will be selected so that the length L1 is about the length of the average hospital bed. The length of the second portion L2 is generally somewhat less than that of the first portion L1.

The width W1 of the first portion 22 is preferably about 29 inches and is slightly greater than the width W2 of the second portion.

A plurality of side handles 26 are attached by sewing or the like to the first portion 22 at spaced intervals along the length thereof. As shown in Figure 3, each handle 26 is in the form of a strap which is folded to form a loop.

A plurality of binding straps 28 are also attached to the first portion 22 at spaced intervals along the length thereof; and as shown in Figure 3, the binding straps 28 are attached to the first portion 22 by the same stitching 30 that is used to attach the handles 26. The straps 28 have a face 32 on which the loops or hooks of a fabric fastener such as one of the elements of a "Velcro" (TM) fastener is provided.

Bands 36 of a complimentary fastener material to that of the binding straps 28 are attached to the back face 38 (Figure 2) of the second portion 24 and extend longitudinally inwardly from the second end 16 in a spaced parallel relationship. A band 37 of a light reflective material is attached to the back face 38 and extends along the full length thereof. The band 37 helps to make the envelope visible to a

- 5 -

rescue crew using flashlights for searching in a dark environment.

A pair of front handles 40 are attached to the first portion 22 and extend outwardly from the end 14. The handles 40 are attached in a like manner to that described and illustrated with respect to the handles 26. The handles 40 are of a similar construction to the handles 26 except that they have a greater length. Preferably the extended length of the handles 40 from the end 14 is about three feet. By comparison the handles 26 extend about six inches from the side edges 18.

Each handle 40 has fastener patches 42 and 44 applied thereto. These fastener patches serve to retain the sheet in the coiled configuration shown in Figure 4 with the result that the front handles 40 perform the dual function of providing a lifting handle and a binding strap for retaining the web in a compact storage coil.

When the evacuation sheet is not in use, it is rolled up from the second end 16 to form a tightly wound coil and the front handles 40 are wound around the coil and the fastener patch 44 is secured to the fastener patch 42 to retain the straps in a position and circling the coil as shown in Figure 4. It will be apparent that this provides a very compact form in which the evacuation sheet of the present invention may be stored. It is so compact that it can be stored at the foot of a hospital bed or underneath a hospital bed. When tightly wound the coil may have a diameter of about four inches. Clearly, it is much easier to store this size of item than it is to store a rigid stretcher. The total weight of a typical evacuation sheet is about 5.2 lbs.

In use, the straps 40 are released from the position in which they encircle the coil so that the coil is free to unwind. The sheet is then located at the foot of a bed and allowed to unwind as the leading end 14 is slipped under the bottom sheet on which the patient 60 is resting and slides along the top of the mattress 62 between the bottom sheet and the mattress 62 of the bed 64. As previously indicated, the web 12

- 6 -

is preferably made from a plastics material which has a low coefficient of friction with the result that it is possible to slide the web 12 over the mattress 62 or a bedsheet located thereon with ease.

When the first section 22 has been fully deployed so that it extends to the position shown in Figure 6 in which the patient is fully accommodated on the first portion 22, the sheet is then folded along a line that the fold line 50, or a fold line that extends parallel thereto, to locate the second portion 24 in an overlying face to face relationship with respect to the first portion 22. In the arrangement shown in Figure 2 the sheet is folded adjacent the first pair of handles 26 and the end 16 is folded inwardly across the width thereof. The binding straps 28 then drawn inwardly and are fastened to the bands 36 to secure the second portion 24 in a face to face relationship. Thus, it will be seen that an envelope 20 is formed which is open between the ends 14 and 16 and is closed along the fold line 50 which forms the other end of the envelope. The sides of the envelope are effectively closed by the binding straps 28 with the result that the patient can be accommodated within the compartment formed within the envelope.

The patient can then be lifted out of the bed by manually engaging the handles 26. Once the patient has been removed from the bed using two or more rescue staff, the envelope 20 can be lowered on to the floor and front handle 40 may be manually engaged to permit the envelope to be dragged along the floor by a single member of the rescue staff to an evacuation site or to a stairwell. Because the end of the envelope 52 is closed, it is possible to lower the patient down a slide as shown in Figure 7 by simply grasping the long front handles 40.

It will be apparent from the foregoing that the evacuation sheet of the present invention is relatively inexpensive to manufacture; and consequently, it may be possible to provide a separate evacuation sheet for each of the hospital beds likely to be occupied by bedridden patients. In addition,

- 7 -

because the evacuation sheet of the present invention is simple to use, practice drills can be carried out from time to time without disrupting the day to day operation of the hospital.

Various modifications of the present invention will be apparent to those skilled in the art. For example, an alternative type of fastener may be used to connect the binding straps to the second portion. It should be understood, however, that the binding system of the present invention is particularly desirable because it permits the binding straps to be applied to the binding bands merely by pressing one on top of the other.

These and other advantages of the present invention will be apparent to those skilled in the art.

I CLAIM:

1. An evacuation sheet adapted to form an evacuation envelope for use when evacuating bedridden patients from a hospital bed or the like comprising;

a) a thin web of flexible fire-retardant material of generally uniform thickness having; a first end, a second end and a longitudinally elongated body extending therebetween, and a pair of oppositely disposed side edges and a width extending between the side edges, said thin web being sufficiently flexible to permit it to assume a compact storage configuration,

b) a first portion of said web extending inwardly from the first end and a second portion extending inwardly from the second end, the first and second portions each having a length that is about equal to the height of the patient that is to be accommodated therebetween in use, said web being foldable across the width thereof to locate the second portion in an overlying relationship with respect to the first portion to form an evacuation envelope that is proportioned to accommodate the body of the patient and which is closed at one end,

c) binding means for releasably connecting the side edges of the first and second portions of the web to retain said second portion in said overlying relationship, and

d) lifting handle means attached to the said edges of the first portion and located at adjacent opposite ends and at about the middle of the length of the side edges of the first portion to permit the envelope to be lifted to carry a patient therein.

2. An evacuation sheet as claimed in claim 1, wherein the handle means further comprises at least one front handle at the first end of the web for use when lowering the evacuation sheet with the closed end lower than the first end.

3. An evacuation sheet as claimed in claim 1, wherein the binding means comprises a plurality of belts that are attached to the first portion of the web and extend outwardly from the side edges of the first portion of the web and at least one attachment band located on the outer face and extending

longitudinally of the second portion, the belts and band having interlocking hook and loop fasteners arranged thereon to permit the belts to be releasably secured with respect to the attachment band.

4. An evacuation sheet as claimed in claim 3, wherein two attachment bands are located on the second portion in a side by side relationship.

5. An evacuation sheet as claimed in claim 1, wherein the web of flexible fire-retardant material has a heat reflective upper surface.

6. An evacuation sheet as claimed in claim 1, wherein the width of the second portion is less than that of the first portion whereby the side edges of the first portion from which the handle means project are readily accessible when the second portion is located in the overlying relationship as aforesaid.

7. An evacuation sheet as claimed in claim 1, wherein the handle means comprises a plurality of belts that are folded to form handle loops, the handle loops being located at a plurality of longitudinally spaced intervals along the length of each side edge.

8. An evacuation sheet as claimed in claim 7, wherein the handle loops at one side edge are aligned with the handle loops at the other side edge of the first portion to permit symmetrical lifting of the envelope in use.

9. An evacuation sheet as claimed in claim 1, wherein the upper and lower faces of the flexible material are each made from a material that has a low coefficient of friction so as to readily slide under a sheet of a bed to facilitate the movement of the first portion under the bedsheet of a bedridden patient in use.

10. An evacuation sheet as claimed in claim 2, wherein the front handle means comprises a pair of flexible straps that are folded to form manually engagable loops, the flexible straps having a substantial length so as to facilitate the lowering of the evacuation envelope from the first end down an incline.

11. An evacuation sheet as claimed in claim 10, wherein the front handle straps have a sufficient length to extend about three feet from said front end.

12. An evacuation sheet as claimed in claim 1, wherein the web is sufficiently flexible to permit it to be rolled up from one end thereof to the other to provide a compact storage coil configuration.

13. An evacuation sheet as claimed in claim 2, wherein said front handle means as adapted to function as a binding strap that serves to retain the web in the compact storage configuration.

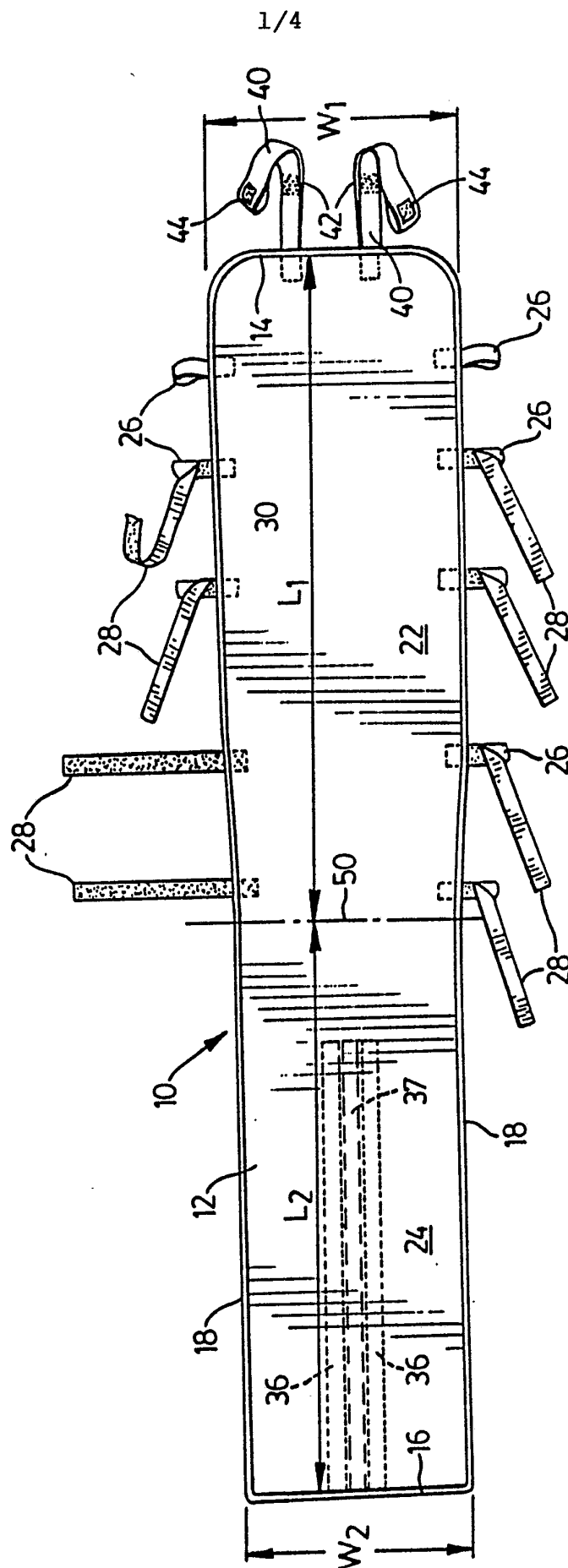


FIG. 1

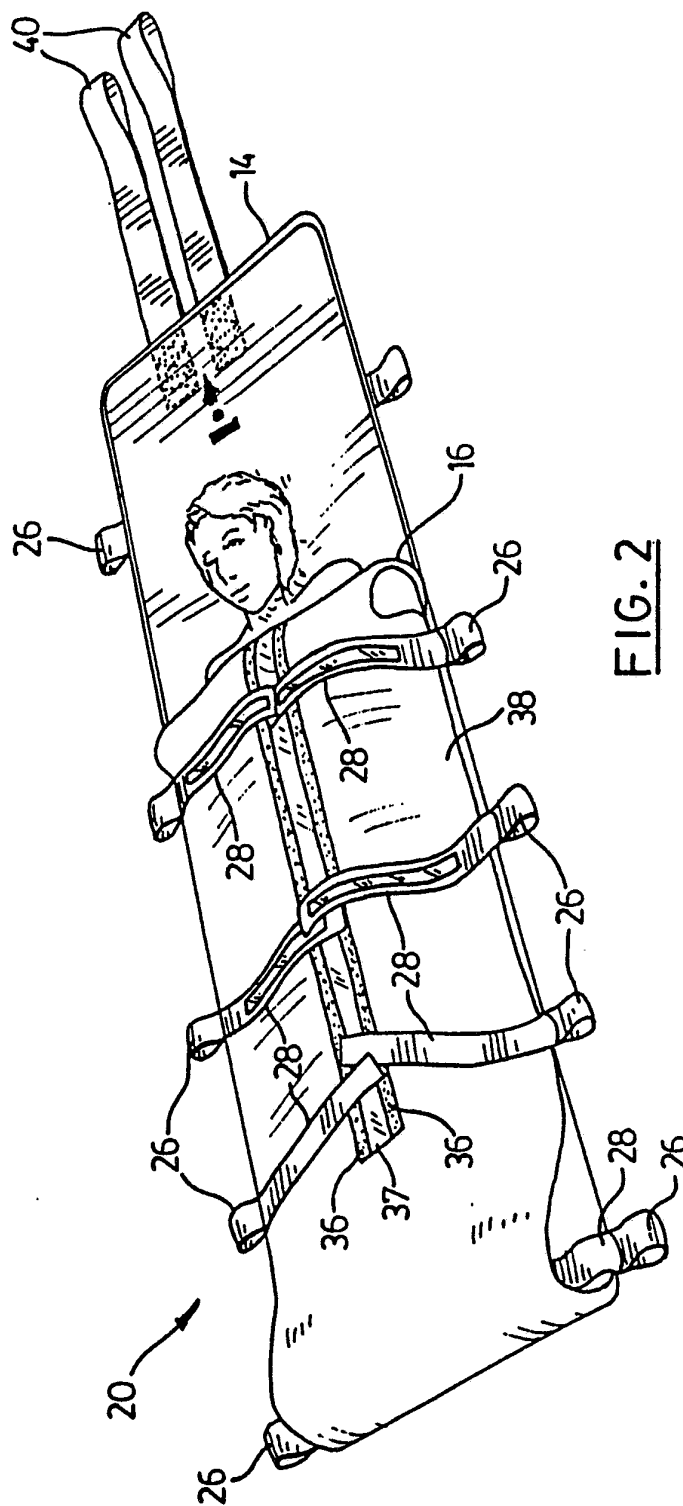
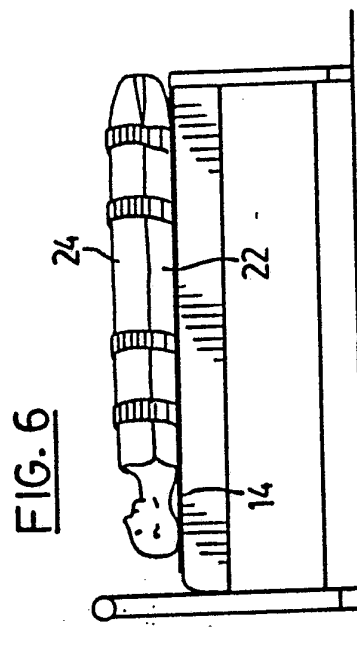
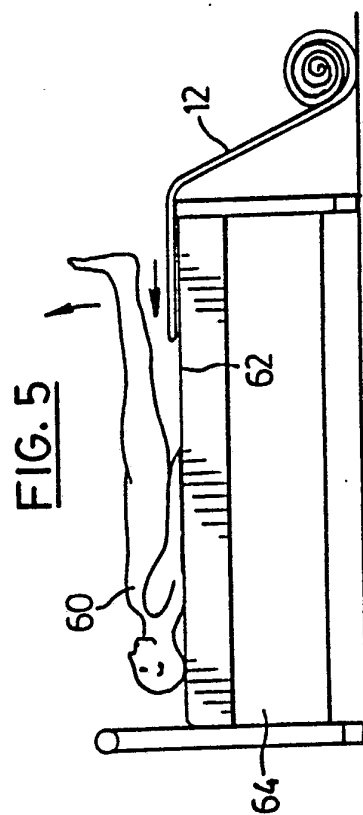
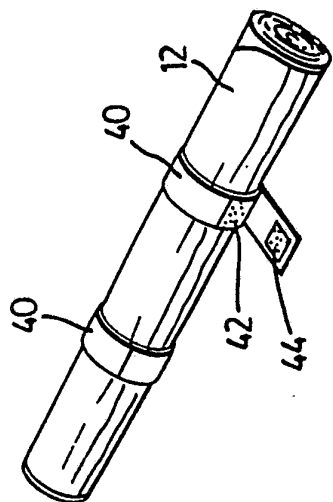
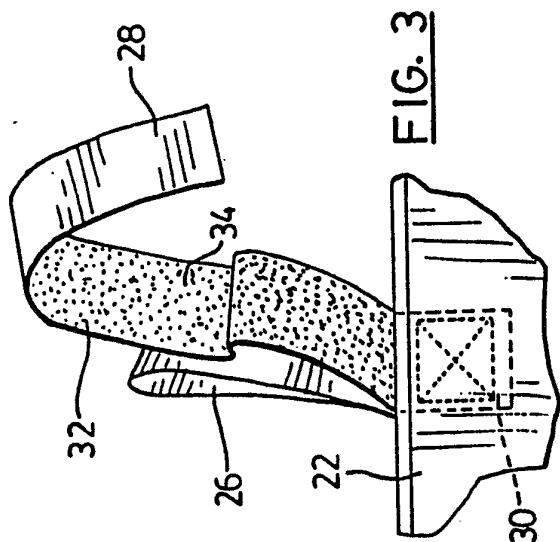
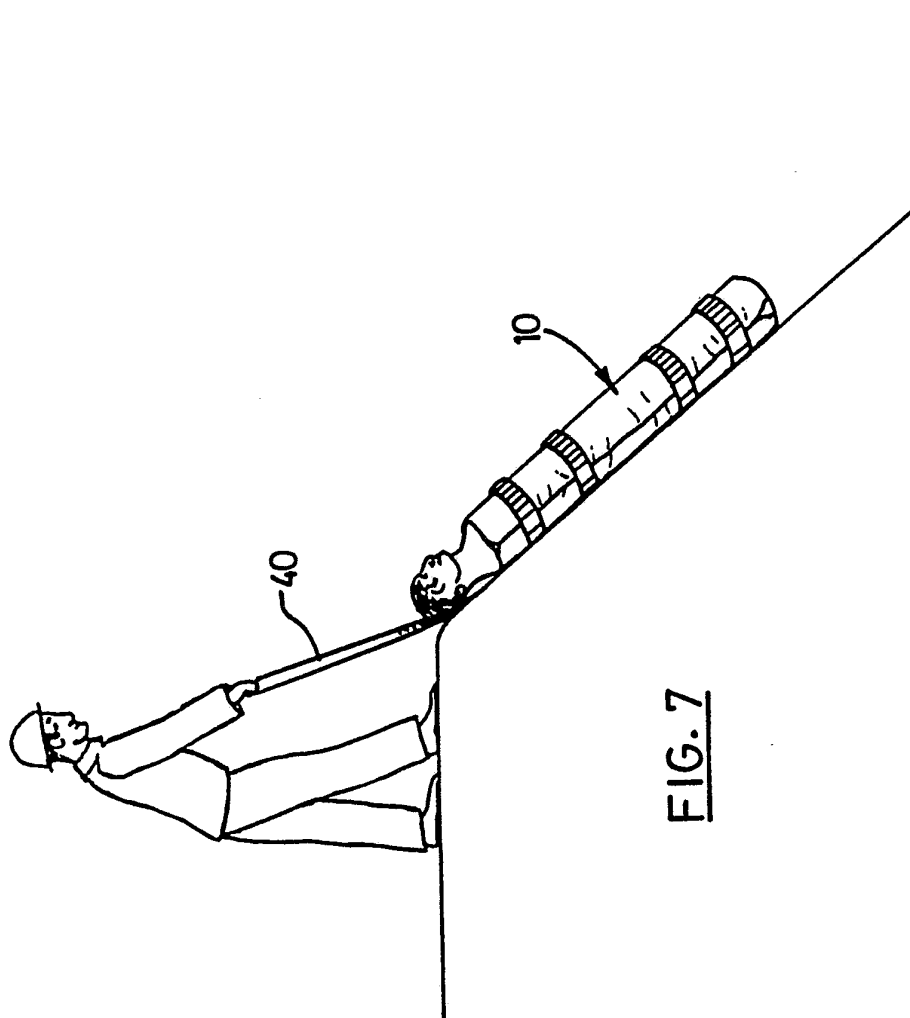


FIG. 2





INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 91/00180

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁴ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁵ : A 61 G 1/003		
II. FIELDS SEARCHED Minimum Documentation Searched ⁷		
Classification System	Classification Symbols IPC ⁵ : A 61 G 1/00, A 61 G 7/10	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ⁶	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	DE, A1, 2 418 374 (KUFAHL) 06 November 1975 (06.11.75), see fig. 1; pages 3,4.	1
A	See totality.	3,4,6, 12
--		
Y	GB, A, 1 536 191 (MORGAN) 20 December 1978 (20.12.78), see fig.; page 1, lines 62-67,86-89.	1
A	See totality.	2-4,7, 8,10, 11
--		
Y	GB, A, 2 030 047 (ANGLIA SAFETY) 02 April 1980 (02.04.80), see fig. 1; page 1, lines 6-10.	1
A	See totality.	2,3,5, 7,12, 13
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Z" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search <div style="text-align: center; font-size: 1.2em;">31 July 1991</div>		Date of Mailing of this International Search Report <div style="text-align: center; font-size: 1.2em;">16.08.91</div>
International Searching Authority <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div>		Signature of Authorized Officer <div style="text-align: center;"> Mme Dagmar FRANK </div>

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	<p style="text-align: center;">---</p> US, A, 2 788 530 (FERGUSON) 16 April 1957 (16.04.57), see fig. 1,2,5.	1-4, 6-8, 10-12
A	<p style="text-align: center;">---</p> US - A - 4 601 075 (SMITH) 22 July 1986 (22.07.86), see fig. 1-6.	1-4, 6-8,12
A	<p style="text-align: center;">---</p> US - A - 4 442 557 (CLEMENS) 17 April 1984 (17.04.84), see fig. 1-3; abstract. <p style="text-align: center;">-----</p>	1,5

ANHANG
zum internationalen Recherchen-
bericht über die internationale
Patentanmeldung Nr.

ANNEX
to the International Search
Report to the International Patent
Application No.

ANNEXE
au rapport de recherche inter-
national relatif à la demande de brevet
international n°

PCT/CA 91/00180 SAE 47670

In diesem Anhang sind die Mitglieder
der Patentfamilien der im obenge-
nannten internationalen Recherchenbericht
angeführten Patentdokumente angegeben.
Diese Angaben dienen nur zur Unter-
richtung und erfolgen ohne Gewähr.

This Annex lists the patent family
members relating to the patent documents
cited in the above-mentioned inter-
national search report. The Office is
in no way liable for these particulars
which are given merely for the purpose
of information.

La présente annexe indique les
membres de la famille de brevets
relatifs aux documents de brevets cités
dans le rapport de recherche inter-
national visée ci-dessus. Les renseigne-
ments fournis sont donnés à titre indica-
tif et n'engagent pas la responsabilité
de l'Office.

Im Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
DE-A1- 2418374	06-11-75	Keine - None - Rien	
GB-A - 1536191	20-12-78	GB-A - 1536191	20-12-78
GB-A - 2030047		GB-A1- 2030047 GB-B2- 2030047	02-04-80 08-12-82
US-A - 2788530		Keine - None - Rien	
US-A - 4601075	22-07-86	Keine - None - Rien	
US-A - 4442557	17-04-84	US-A - 4478452	23-10-84