COMBINATION SPLINT AND LITTER


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10 Claims. (Cl. 5—82)

The present application is a continuation-in-part of co-pending application Serial No. 236,305, filed November 8, 1962.

The present invention relates generally to rescue apparatus and in particular to a combination foldable litter and splint for transporting injured or incapacitated persons.

It is an object of this invention to provide a lightweight, foldable, inexpensive litter formed from a one-piece sheet of semirigid material such as compressed fiberglass and which may include tie-down strap means for immobilizing a victim to be transported thereon.

It is another object of this invention to provide a lightweight litter that may be folded in relatively compact, substantially flat condition for storage and shipping purposes in which condition minimum space is required for each unit.

It is still another object of this invention to provide a litter formed from a one-piece sheet of semirigid material which includes a center panel having hand-hold apertures provided along its opposite sides, and end panels joined to the center panel by fold lines, the end panels being foldable inwardly over the center panel when it is desired to store the litter.

Accordingly, the present invention satisfies a need long recognized by government, rescue service organizations, industry, and institutions, for a simple lightweight, disposable, if desired foldable, easily stored and inexpensive litter that may be placed in desired location when not in use, and quickly available in the event of an emergency requiring its immediate application.

Prior art litters, foldable or not, have either been designed for maximum strength, durability, and functional efficiency or have been formed of simple fabric material stretched across bracing rods. The present invention combines the advantages of both types of designs and provides a litter that is easily portable and light as a cloth stretcher, yet is sufficiently rigid to support a victim in prone position without allowing harmful bending of his body when he is being transported. Moreover, the litter comprising the subject material of the present invention is capable of being stored in a compact, substantially flat configuration which is relatively impossible with a conventional litter formed of many parts and designed for a long term of service.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of litter embodying the present invention in extended or unfolded condition;
FIG. 2 is a plan view of the litter shown in FIG. 1 in folded condition;
FIG. 3 is a side elevation view taken along 3—3 of FIG. 2;
FIG. 4 is a sectional view taken along 4—4 of FIG. 1; and
FIG. 5 is a sectional view taken along 5—5 of FIG. 1;
FIG. 6 is a plan view of an alternate embodiment of a litter formed in accordance with the present invention;
FIG. 7 is a plan view of the litter of FIG. 6 in folded condition;
FIG. 8 is a side elevation view of the folded litter shown in FIG. 7; and
FIGS. 9, 10 and 11 are top, side and section line (line 11—11 on FIG. 9), respectively, of another embodiment suitable for mailing.

Referring to FIG. 1, a litter embodying the present invention is shown and comprises a one-piece sheet 10 of compressed, semirigid fiberglass material. The sheet forming the litter includes an elongated center panel 12 and two end panels 14 and 16 extending from each end of the center panel. Each of the end panels 14 and 16 is joined to the center panel along transverse fold lines 18 and 20, respectively, as shown in FIG. 5.

Along opposite side edges of the center panel 12 are provided hold cutouts or apertures 22 used in grasping and handling the litter by persons transporting an injured party being carried by the litter. Adjacent the end extremity of an end panel of the litter, such as end panel 14 in this instance, an accurate cutout 24 is seen to provide an integral tab portion 26 used in retaining the litter in folded condition, as seen in FIGS. 2 and 3.

As also seen in FIGS. 2 and 3 when the litter is in folded or stored condition, end panels 14 and 16 are folded inwardly over the center panel 12 and the tab 26 engages the overlapping end extremity of the opposite end panel 16 to prevent the end panels from flapping loosely about their respective fold lines. It will be readily apparent that any suitable fastener could be used in place of the integral tab 26, such as, for example, a snap fastener (not shown).

The one-piece sheet 10 forming the litter is normally flat. However, it is semirigid and capable of being gently curved without breaking when subjected to service loads, such as when it is used to transport injured victims. In such condition the sheet 10 will curve slightly as shown in FIG. 4 to cradle the victim being transported and its curvature will increase (more concave) or decrease (less concave) in response to sudden vertical acceleration forces whereby the sheet material will function as a shock absorber to gentle sudden forces which could otherwise be directed upon the victim being carried by the litter. The sheet is designed, it should be noted, to withstand forces of greater magnitude than are expected in its service life despite its light weight and lack of bulk. This is accomplished through use of suitable filler and bond material compressed to desired hardness and toughness to produce a sheet of optimum strength and desirability within design limitations. Moreover, the litter is designed for storage and use in all climate conditions.

To improve its material resistance to moisture and normal wear and tear, the sheet 10 forming the litter is coated with a suitable nitro-cellulose base material which fills the pores of the fiberglass sheet and resists moisture penetration. The fiberboard sheet 10 itself is preferably formed from high-strength kraft lined on both sides with jute filler, the stock being bonded with a suitable weatherproof polyvinyl type of bonding agent and compressed to a very dense board.

As seen in FIGS. 1 and 2, the end panels 14 and 16 in this instance are formed smaller in lateral dimension than the center panel so that when the litter is folded (FIG 2) the end panels will not cover the hand-hold apertures 22 but will have them exposed to facilitate handling the litter in folded condition.

It should be noted that although the end panels 14 and 16 freely hinge about their respective fold lines 18 and 20 when the sheet 10 is in flat condition, when the sheet is loaded and curves inwardly slightly, the end
panels 14 and 16 and the fold lines 18 and 28 also curve in the identical manner thereby locking the end panels in extended position due to the transverse nature of the curvature. The latter then becomes an effective stretcher-type bear which is sufficiently rigid in the longitudinal sense to carry any desired load by means of the hand-fold apertures 22. If desired, suitable stress relieving or reinforcing means (not shown) may be provided at each hand-fold aperture 22 to increase the strength of the sheet and make for a more comfortable gripping section.

An alternate embodiment of the litter of the present invention is shown in FIG. 6. The litter shown in this instance comprises a combination litter and splint where the end panels are provided to enable an injured incapacitated victim (or any part of his body) to be immobilized. Accordingly, the litter is formed of a one-piece, semirigid sheet of compressed fiberboard, as described above. The sheet includes two end panels 30 and 32 joined to a central panel 28 along respective transverse fold lines 34 and 42. Hand-folded apertures or apertures 46 are provided along opposite side edges of both the center panel 28 and the end panel 30 and tie down strap receiving apertures 38 are also provided along the same side edges.

The down strap means 48 having free end portions 50 are laced across the center panel 28 and end panel 30 as shown, these engaging the strap receiving apertures 38 provided for the purpose. Of course, the term strap is to be understood to include virtually any suitable strand or web material possessing the required strength and elastic properties. Likewise, although apertures 38 are preferred for enabling the tie down straps 48 to be laced across the sheet forming the litter, any suitable strand engaging means could be used for the purpose.

It will be noted that the straps 48 are laced across the top surface of the center and end panels 28 and 30 (FIG. 6), through the apertures 38 and back across the under surface of the panels (FIG. 7). The straps thus are used to give reinforcement to the sheet material of the litter when the end portions 50 of the strap 48 are secured against free movement.

The end panel 32 which would be the end of the litter upon which a victim's head would probably be placed in use includes side flaps 34 and 36 joined to the end panel along fold lines 44. A strap means 52 is provided in one side flap 36 and an aperture 54 is formed in the other side flap 34. In use, the side flaps 34 and 36 may be folded to an upright position and secured in such position by means of the strap 52 and aperture 54 whereby a victim's head may be cradled and protected from being struck by foliage or other objects in the vicinity while he is being transported.

In FIGS. 7 and 8 the litter is shown in folded, flat condition.

In FIGS. 9, 10 and 11 are illustrated top, side and section (line 11—11 on FIG. 9), respectively, of another embodiment of the invention as modified to be suitable for mailing in the folded state.

Instead of having two fold lines in the one-piece sheet of semirigid material as illustrated in FIG. 6, the mailing embodiment capable of being sent by first class mail or parcel post is modified by having three fold lines, 43, 41 and 39, respectively, as illustrated in FIG. 9, these defining the head panel section 33, the chest panel section 31, the thigh and panel section 29 and the foot panel section 27. For this modified form, the side strap means 59a of FIG. 11 are arranged through the apertures in criss-cross manner at the top surface of the litter to assist in lying down the patient who is transported on the litter.

To facilitate folding (see folded side view of FIG. 10), the head panel section is provided with folded side flaps 35 and 37 and with apertures in these flaps through which the tie-down head straps means 52a may be inserted.

In the embodiment shown in FIGS. 9 and 11, the staple 55 serves to fasten edge reinforcing tape 51 along opposite longitudinal innermost sides of the litter. These innermost sides are cut to form a separate reinforced marginal edge for each of the four panels in the manner shown in FIGS. 4 and 10. Hand folding of the litter for packaging and mailing is facilitated.

The sheet material used in forming the litter of the present invention is conveniently printable, and, if desired, suitable operating instructions, emergency first aid advice, etc., may be printed on any exposed surface of the litter.

Since certain changes may be made in the above product and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described by invention, what I claim as new and desired to secure by Letters Patent is:

1. A foldable litter comprising a one-piece sheet of semirigid material formed of compressed fiberboard which resists penetration by moisture, said sheet including an elongated center panel, and an end panel on each end of said center panel, each of said end panels being hingedly connected to said center panel along a transverse fold line, one of said end panels being of smaller transverse dimension than said center panel, said center panel having hand-folded apertures provided along adjacent opposite side edges thereof, and one of said end panels being bendable over the center panel and capable of being folded inwardly over said center panel leaving the handfolded apertures at the underside of the sheet uncovered in folded form.

2. The foldable litter of claim 1 wherein said sheet is formed of compressed fiberboard material having a nitrocellulose base, moisture resistant coating thereon.

3. The foldable litter of claim 2 wherein one of the said end panels includes an integral tab for engaging the end extreme of the other of said end panels when the litter is folded.

4. A foldable litter comprising a one-piece, semirigid sheet of compressed fiberboard material which resists penetration by moisture, said sheet including an elongated center panel and an end panel joined to said center panel on both sides of said center panel, each of said end panels being hingedly connected to said center panel along a transverse fold line, said end panels being of smaller transverse dimension than said center panel whereby they are adapted to be folded inwardly over and within the confines of the center panel to form a package, said center panel having hand-folded apertures and tie down strap receiving means provided adjacent opposite side edges thereof; and tie down straps laced across said center panel and engaging said strap receiving means.

5. The foldable litter of claim 4 wherein said strap receiving means comprise apertures in said center panel.

6. A foldable litter comprising a one-piece, semirigid sheet of compressed fiberboard material including an elongated center panel, end panels joined to said center panel along transverse fold lines, one of said end panels being of smaller transverse dimension than said center panel whereby the end panels are adapted to be folded inwardly over and within the confines of the center panel to form a package, said center panel and at least one end panel having hand-fold and tie down strap receiving apertures provided adjacent the side edges of said panel; and
at least one tie down strap laced across said center panel and said one end panel and through said strap receiving apertures, said strap having free end portions.

7. The foldable litter of claim 6 wherein one of said end panels includes side flaps joined to said end panel along fold lines, and strap means for tying said side flaps together in a substantially upright position.

8. A foldable litter as claimed in claim 6 wherein said one-piece sheet is provided with three transverse fold lines to form four panel sections, a head panel section, a chest panel section, a thigh-knee panel section and a foot panel section, said fold lines adapting the litter for packaging and mailing.

9. A foldable litter as claimed in claim 8 wherein the opposite longitudinal sides of each of said panel sections are provided with inturned marginal edges.

10. A foldable litter as claimed in claim 9 wherein each of said inturned marginal edges is reinforced with tape means secured thereto.

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