

Jan. 9, 1962

R. HARRISON III, ET AL
PORTABLE SHELTER

3,016,115

Filed Aug. 13, 1958

2 Sheets-Sheet 1

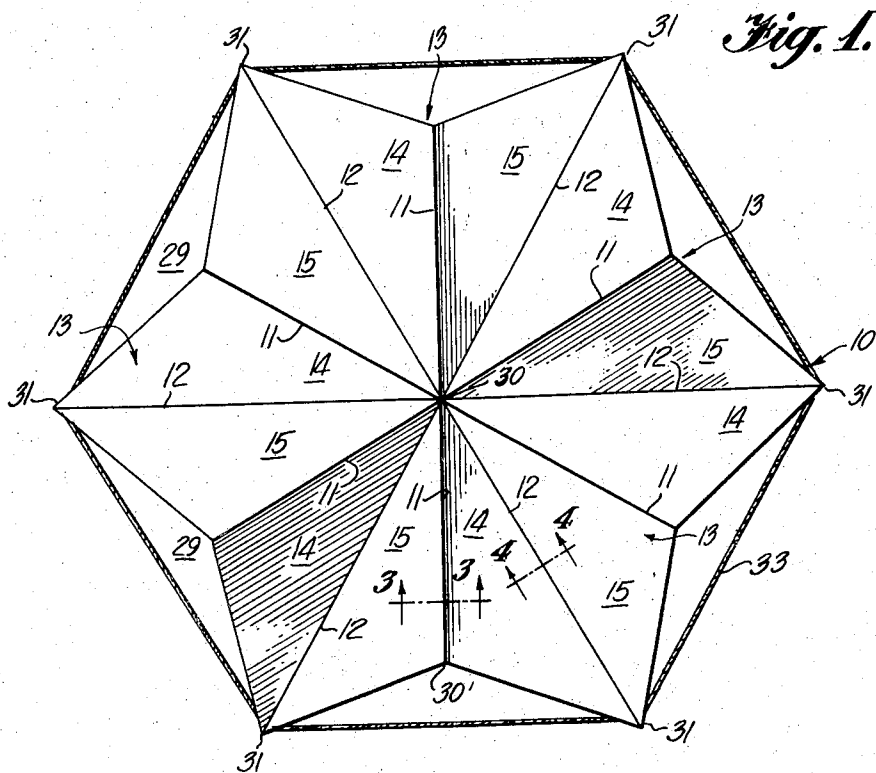


Fig. 1.

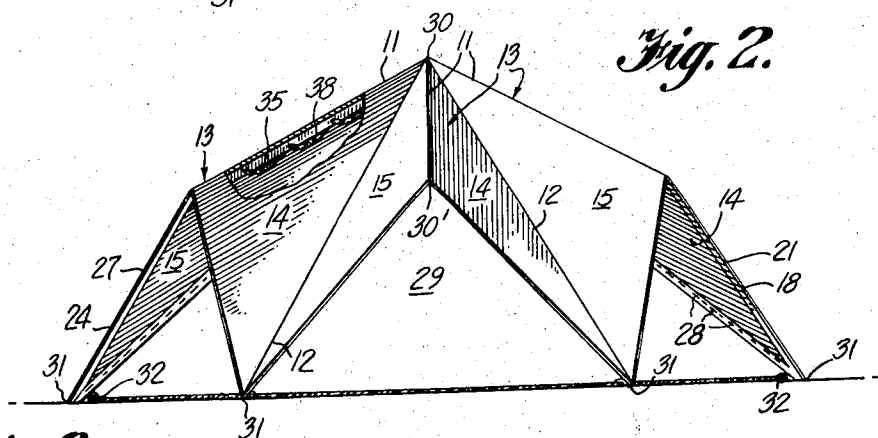


Fig. 2.

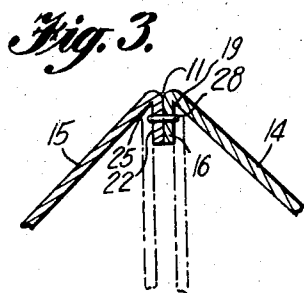


Fig. 3.

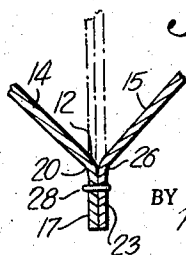


Fig. 4.

INVENTORS

*Richard Harrison III,
Henry V. Shriver and
Ayler J. Hubbard, Jr.*

BY *Mason, Fenwick & Lawrence*
ATTORNEYS

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R. HARRISON III, ET AL

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Fig. 5.

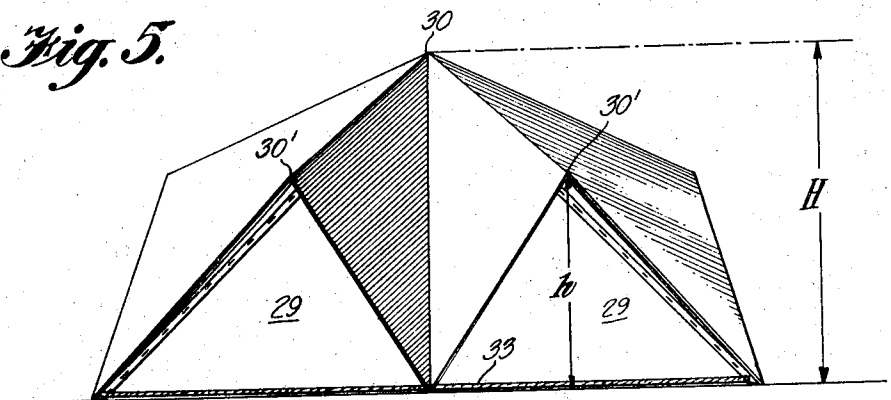


Fig. 6.

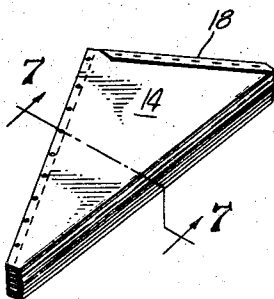


Fig. 7.

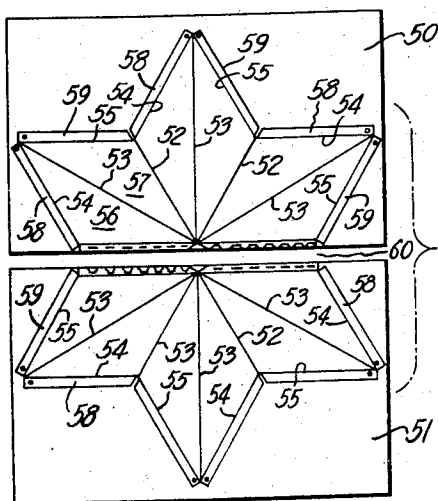
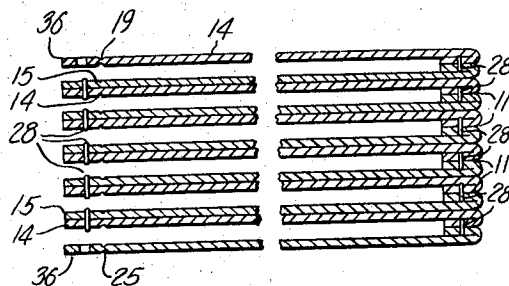


Fig. 8.

INVENTORS

*Richard Harrison III,
Henry V. Shriver and
Ayler J. Holland, Jr.*

BY *Mason, Fenwick & Lawrence*
ATTORNEYS

1

3,016,115

PORTABLE SHELTER

Richard Harrison III, 63 Prospect Parkway, Portsmouth, Va.; Henry V. Shriver, 128 Sir Oliver Road, Norfolk, Va.; and Ayler J. Holland, Jr., 417 Rudee Blvd., Virginia Beach, Va.

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7 Claims. (Cl. 189-2)

This invention relates to portable shelter and more particularly to foldable portable shelters.

Shelters which may be carried to the beach or to a picnic and which are quickly and easily set up there will add tremendously to the pleasure of the outing. In the past such shelters have consisted generally of a framework and a canvas covering. The framework usually consisted of a number of stakes and guys and required considerable time to erect. Also the canvas covering consisted of one or more heavy bulky pieces of canvas, and considerable time and labor were required to mount them on the framework.

Consequently, it is an object of the present invention to provide a light-weight portable shelter which will fold to a small compact package.

It is a further object of the invention to provide a shelter which derives its support from its peculiar configuration obviating the necessity of providing a framework of any type.

Another object of the invention is to provide a portable shelter which may be carried under a person's arm and which may be easily erected and demounted by one person.

Other objectives and advantages of the present invention will become apparent to persons skilled in the art from the following description when read in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a top view of a portable foldable shelter made in accordance with the present invention;

FIGURE 2 is a side elevation of the shelter shown in FIGURE 1, a portion of the panel adjacent the placket being broken away to show the lacing;

FIGURE 3 is a fragmentary vertical transverse sectional view through the ridge hinge of one of the dormer-like sections of the shelter taken on the line 3-3 of FIGURE 1, the folded position of the panels making up the dormer-like section being shown in broken lines;

FIGURE 4 is a fragmentary vertical transverse sectional view through the valley hinge of one of the dormer-like sections of the shelter taken on the line 4-4 of FIGURE 1, the folded position of the panels being shown in broken lines;

FIGURE 5 is a side elevation of the shelter shown in FIGURE 1 taken from a vantage point 90° to that for FIGURE 2;

FIGURE 6 is a perspective view of the shelter in which the hinged panels have been folded into a compact package;

FIGURE 7 is a vertical transverse sectional view through the stack of hinged panels, showing the valley hinges on the right hand side of the view and the placket and ridge hinges on the left hand side taken on line 7-7 of FIGURE 6; and

FIGURE 8 is a plan view of the development of a modified form of the invention from corrugated board blanks.

In our co-pending application Serial No. 739,120, now Patent No. 2,938,526, we disclosed a collapsible shelter which may be easily carried by a person and erected by pressurizing it. The uses to which the shelter of the present application may be put are similar to those of the above identified application, but the materials from which the present shelter may be made and the mode of erec-

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tion and demounting the present shelter are different from the shelter of our said co-pending application.

The portable shelter of the present application may be used for beach and picnic shelters, toy houses for indoor or outdoor use, sportsmen's shelters, temporary military shelters for personnel or supplies, and for agricultural or horticultural purposes, such as the protection of shrubs or bushes which may be damaged by freezing rains during the winter. The material of which the present shelter is made may be any rigid or semi-rigid sheet material, such as for example, corrugated board or the like.

As may be seen in the drawing and particularly FIGURES 1, 2 and 5, there is shown a shelter 10 in erected position. A plurality of fold lines 11 and 12 radiate from the apex to the periphery of the shelter, and define a plurality of dormer like sections or trihedral angles 13 when the shelter is erected and accordion-like pleats when the structure is demounted and folded for transportation and storage as seen in FIGURE 6. The fold lines 11 are at the ridges of the dormer like sections and the fold lines 12 are at the valleys between the dormer like sections. For convenience in illustrating the invention, a shelter comprising 6 dormer-like sections has been shown but the shelter may be composed of 3 or more such sections.

Each of the dormer-like sections 13 is formed of two triangular shaped plates or sheets 14, 15 of corrugated board, the material used for describing the invention. Where the shelter is for indoor use as a toy the corrugated board may be left untreated; but where the shelter is for outdoor use it may be treated with any suitable waterproofing compound, such as a natural or synthetic resin waterproof coating. Metal foil, such as aluminum foil or the like, may be used to cover the outer surface of the corrugated board to further weatherproof it and to insulate it from radiation.

One method of assembly provides that each of the triangular plates 14 are provided with the tabs 16, 17 and 18 defined by the crease lines 19, 20 and 21; and each of the plates 15 are provided with the tabs 22, 23 and 24 defined by the crease lines 25, 26 and 27. The crease lines 19 and 25 form a double leaf hinge at the ridge of the dormer-like sections, the plates 14 and tab 16 representing one leaf hinge and the plate 15 and tab 22 representing the other leaf hinge. The tabs 16 and 22 are fastened together by any convenient means, such as a plurality of staples 28.

In a like manner the valley folds 12 have crease lines 20 and 26 formed between the plate 14 and tab 17 and plate 15 and tab 23, respectively with the tabs 17 and 23 fastened together by means of said staples 28.

The tabs 18 and 24 of the plates 14 and 15 respectively are located on the outer edges of the dormer-like sections and reinforce this front edge of the entrance portion 29 of the dormer-like sections. The tabs 18 and 24 are bent back upon the respective plates and fastened by any convenient means such as a plurality of staples 28. The valley folds 12 extend from the apex, or hub, 30 of the shelter to the ground, with the shelter standing on the ground engaging portion, or feet 31. A grommated tab 32 is attached or holes are provided in tabs 17, 23 at each of the feet 31 and a tie 33, such as a rope, is fastened to each foot at the grommets or holes to circumscribe the shelter.

The length of this circumscribing tie determines the height H of the shelter from the ground to the apex 30 of the shelter and also the height h from the ground to the apex 30' of all of the triangular accesses 29 of the dormer-like sections. When the tie 33 is lengthened the shelter in FIGURE 1 covers more area, but is lower in height.

The portable shelter of the present invention is a folded

plane, each of the folds being in a reverse direction to those on either side.

To fold it accordion-like into a small package as shown in FIGURE 6 it is necessary to provide a placket, or opening 35 in the plane which extends from the apex 30 of the structure to its periphery. The placket 35 may extend along one of the fold lines 11, as shown in FIGURE 2, so as not to weaken a foot 31, but it may be extended along one of the fold lines 12 or it may extend from the apex 30 through any one of the plates 14 or 15 intermediate the fold lines 11 and 12. While only one placket 35 is shown, more than one may be provided as for example, where a very large shelter is to be provided and its weight may be such that it could best be transported in halves or in more than one section. To form the placket 35, one of the plates 14 and one of the plates 15 is formed with extended tabs 36 which are creased for hinges at 19 and 25 and punched for fastening. A plurality of grommets may be spaced longitudinally of the extended portions 36. A rope or other suitable fastening means 38 releasably closes the placket.

The tie 33 to be fastened at each of the feet 31 to give the desired height of shelter may be provided with several length adjustments. The tie may be located above and within the shelter connecting leg to leg or individual anchors may be provided at each foot.

It will readily be seen that if the material of which the shelter is made is not suitable for creasing to make the fold lines 11 and 12, a flexible material or hinge may be joined to the plates 14 and 15 along the fold lines 11 and 12 to form these fold lines.

In FIGURE 8, the development from corrugated blanks of a modified form of the shelter of the present invention is shown.

A pair of blanks 50, 51 of corrugated board, each provide one-half of the shelter. In this case the fold lines 52, 53 are single leaf hinges and are made by simply creasing the corrugated board. The folds 53 are creased in one direction to form valleys and the folds 52 are creased in the opposite direction to form ridges for the dormer-like sections of the shelter. The crease lines 54, 55 formed between the plate sections 56; 57 and tabs 58, 59 respectively, provide reinforced edges for the access openings of the shelter when the tabs are fastened to the plates.

A placket 60 extending transversely across the shelter along two oppositely extending ridges are fastened together by means of interlocking tongues 61 and slots 62. To assemble the shelter when it has been punched from the corrugated board and creased as described, it is only necessary to join the two halves of the shelter along the placket 60 by interlocking the tongues 61 and slots 62. A tie (not shown) is provided for holding the shelter in erected position. The two halves of the shelter will each fold into a compact package; or, if only half of the placket 60 is unfastened when the shelter is demounted, the shelter may be folded into one compact package.

While there has been disclosed in the foregoing description a practical embodiment of the portable shelter and a modification in accordance with the present invention, it will be understood by those skilled in the art that variations in the implementation of the concept of the invention are within the purview and scope of the invention.

What is claimed is:

1. A portable collapsible shelter comprising, a sheet of substantially rigid material having a hub and a perimeter spaced therefrom, a plurality of hinge lines extending from said hub and intersecting said perimeter, adjacent hinge lines being foldable in opposite directions, a tie variable in length at will, and attachment means adjacent alternate hinge lines and spaced from said hub to holdingly receive said tie, whereby said alternate hinge lines may be adjustably held conjointly inwardly of the hinge lines intermediate said alternate hinge lines to vary the height and width of said shelter in set up condition.

2. A portable collapsible shelter comprising two or more sheets of substantially rigid material, each of said sheets having a hub portion, fold lines radiating approximately 180° from each of said hub portions, said fold lines including a demountable foldable edge portion along each sheet edge, said demountable foldable edge portions intersecting said hub portions, the hub portion and said demountable foldable edge portion on each sheet mutually registering, cooperating means on said edge portions to connect said edge portions together, alternate said fold lines folding in an opposite direction to adjacent fold lines, adjustable securing means adapted to be positioned along said alternate fold lines remote from said hub portion whereby said shelter may be adjusted in height and width when in set up condition.

3. The portable collapsible shelter recited in claim 2, wherein the cooperating means comprises cooperating tongue and groove connections.

4. The portable collapsible shelter recited in claim 3, wherein the adjustable securing means comprises a circumferential tie means.

5. A portable collapsible shelter comprising a plurality of similar triangularly shaped rigid sheets, said sheets being hinged together by fold lines forming a hub, certain of said fold lines extending from said hub to define a perimeter in set up condition spaced from said hub, inward fold lines folding towards the center of the shelter, outward fold lines adjacent each said inward fold lines and folding away from the center of the shelter, said inward and outward fold lines being alternately arranged around said shelter, said perimeter being defined by the ends of said inward fold lines, accesses to the interior of the shelter being provided at the extremities of the said outward fold lines, said accesses being formed by adjacent sheets, means secured to adjacent sheets, adjacent said inward fold lines, adjacent said perimeter and extending across said accesses for determining the height and width of the shelter in a set up condition.

6. The portable collapsible shelter as defined in claim 5, wherein the means secured to adjacent sheets is an adjustable flexible tie.

7. A portable collapsible shelter comprising a plurality of similar triangularly shaped rigid sheets, said sheets being hinged together by fold lines forming a hub, said fold lines including at least one demountable hinge line, certain of said fold lines extending from said hub to define a perimeter in set up condition spaced from said hub, inward fold lines folding towards the center of the shelter, outward fold lines adjacent each said inward fold lines and folding away from the center of the shelter, said inward and outward fold lines being alternately arranged around said shelter, said perimeter being defined by the ends of said inward fold lines, accesses being provided at the extremities of each of said outward fold lines and formed by adjacent sheets hinged at each of said outward fold lines, said accesses having the shape of a cut out formed by a vertical plane intersecting each of said outward fold lines and the extremity of the adjacent inward fold lines, adjustable and flexible means secured to adjacent sheets, adjacent said inward fold lines adjacent said perimeter for varying the height and width of the shelter in a set up condition.

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