Aug. 25, 1964 J. N. JOHNSON 3,145,719

CONVERTIBLE SHELTER

Filed June 1, 1961 2 Sheets-Sheet 1

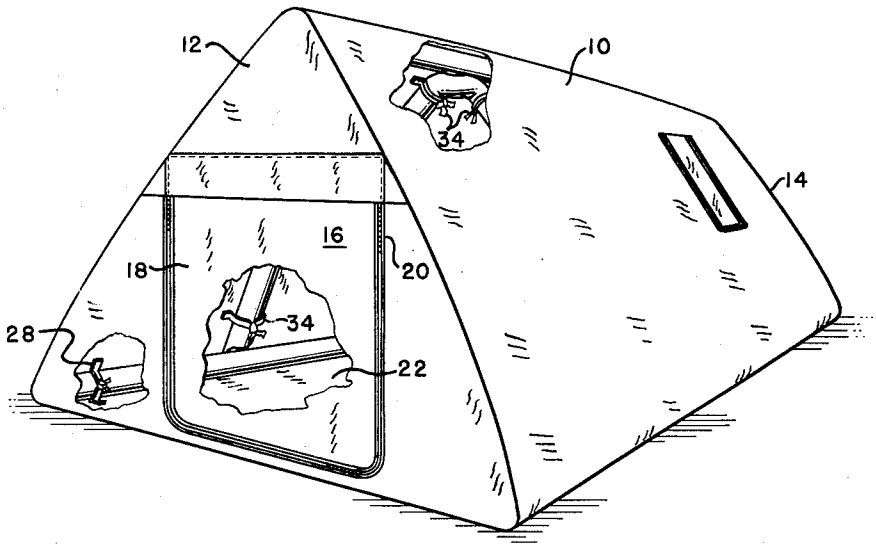


FIG. 1.

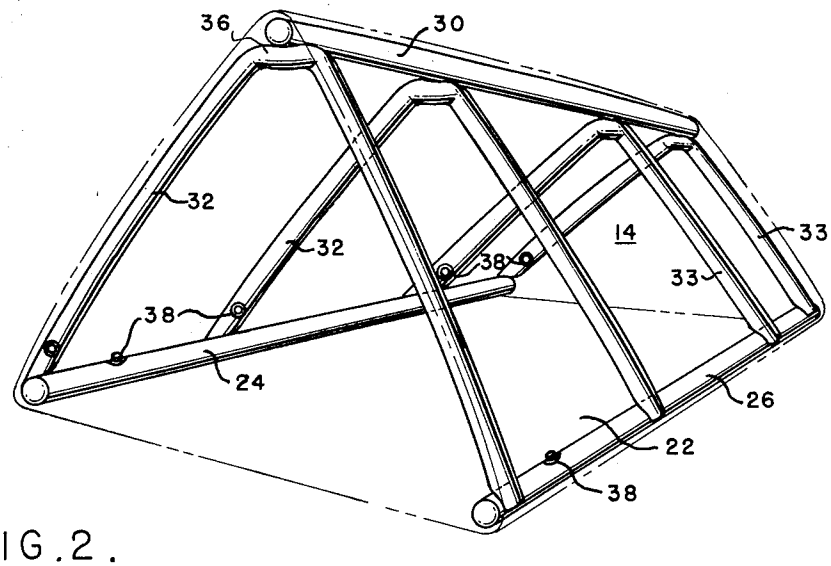


FIG. 2.

INVENTOR.

JACOB N. JOHNSON

BY John P. Dellett

ATTORNEY.

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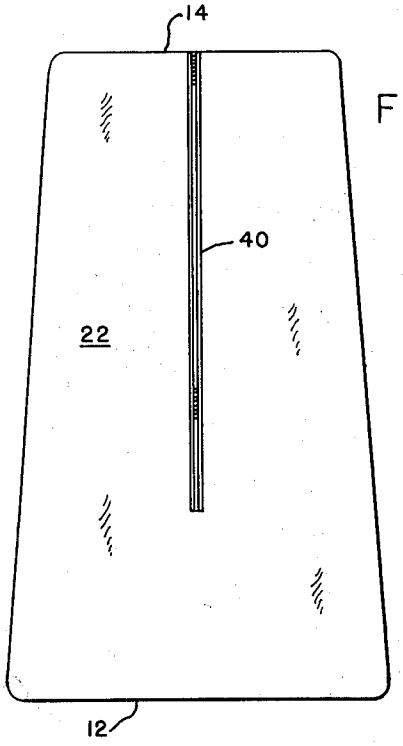


FIG. 3.

FIG. 4.

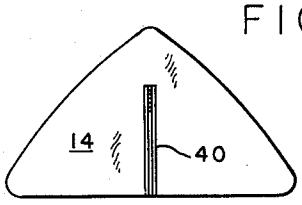
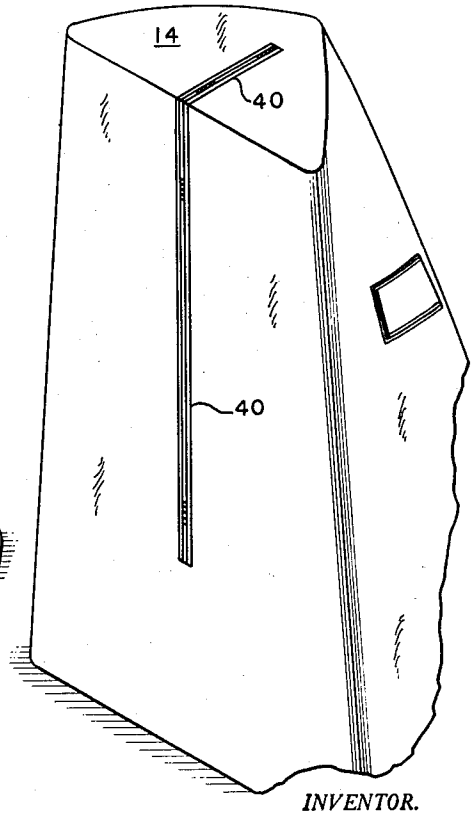


FIG. 5.



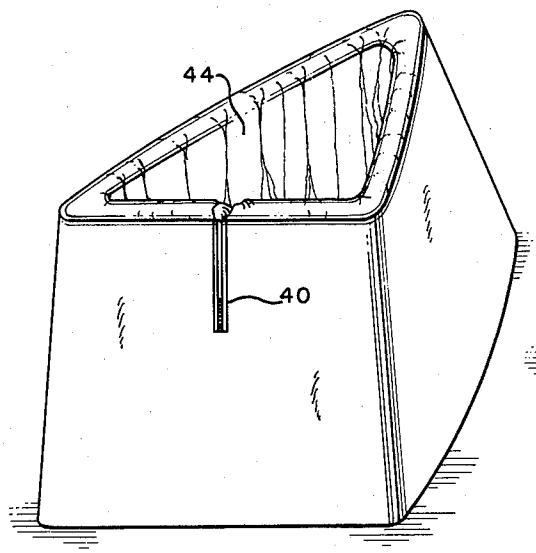


FIG. 6.

INVENTOR.
JACOB N. JOHNSON
BY John P. Pellett

United States Patent Office 3,145,719 Patented Aug. 25, 1964

3,145,719

CONVERTIBLE SHELTER

Jacob N. Johnson, 2231 Webster Drive, Schenectady, N.Y.

Filed June 1, 1961, Ser. No. 114,238
5 Claims. (Cl. 135—1)

The present invention relates to a convertible shelter and more particularly to such a shelter internally supported with independently inflatable tubes.

The present invention contemplates a multi-purpose shelter for at least one person which can be horizontally employed as a sleeping tent and which is convertible, when oriented vertically, for use as a duck blind, fish house, or the like. This combination structure obviates the requirement of transporting several different shelters on expeditions and camping trips.

The present invention is a preferred embodiment employs a weather-proof enclosure of appropriate proportions to receive the human body, the structure being supported internally with a plurality of flexible air-inflatable tubes. Heretofore, inflatable structures of the type exemplified by rubber life rafts and the like have included an integral multi-branch air passage, inflatable to distend and shape an overall structure into the desired proportions. However, such a multi-branch air passage arrangement is not only expensive to fabricate in a collapsible shelter because of the many air-tight joints and connections required, but also such an arrangement lacks flexibility in allowing shaping of the shelter to a plurality of different uses.

It is therefore one object of this invention to provide a convertible shelter, capable of being easily transported and which is erectable as a useful and accessable structure either in a horizontal position or vertically on one end.

It is another object of this invention to provide a convertible shelter with air-inflatable inner structure members capable of distending the shelter into more than one overall shape.

It is another object of this invention to provide a convertible shelter which is simple and economical to manufacture, easy to repair, and simple for one person to transport and erect.

In accordance with the invention a convertible shelter is formed of weather-resistant sheet material inclosing an inner supporting structure. The inner structure distends the weather-resistant material into what may be described as a hollow tubular passage with inside dimensions sufficient for receiving the human body, and having a flat side for positioning on the ground, whereby the structure may function as a sleeping tent. Closures are provided at each end of the tubular passage, at least one of which has an opening serving as an entrance to the structure.

The supporting framework within the passage is made collapsible adjacent one of the ends of the enclosure, and that end is provided with an opening seam permitting the weather-resistant outer material to fold within the passage when the shelter is supported on its other end. The structure then forms a useful top opening duck blind, deer stand, or the like. The top end of the vertically supported structure may be alternatively left flat, or drawn together if desired to form a full length shelter with a pointed top configuration; in either case access is had to the shelter through one side thereof. The arrangement has the advantage of overhead protection against the elements to an individual vertically standing or sitting inside.

According to another feature of the present invention the inner supporting structure comprises a plurality of long straight flexible individualy inflatable plastic or rubber tubes, each removably secured to the inside of the outer covering material. Three tubes are disposed longitudinally of the outer casing in a triangular configuration such that a flat side of the shelter is defined between two such tubes, with the roof ridge being defined by the third. A plurality of other inflatable tubes are then disposed from one of the tubes defining the flat side, under the tube defining the ridge, and back to the other tube defining the flat side. Then when all the tubes are individually inflated, the said other tubes arch the covering material away from the flat side forming a roomy somewhat triangular shelter.

Inasmuch as the tubes are individually inflatable and individually secured to the inside of the casing, the tubes may be easily inflated by one man, and easily replaced. Furthermore, selected tubes may be removed or partially inflated as desired, to change the proportions of the structure at will.

Other objects and advantages will become apparent upon consideration of the present invention taken in connection with the following figures wherein like reference numerals refer to like elements and wherein,

FIGURE 1 is a perspective view of the convertible shelter according to the present invention disposed horizontally on the flat side thereof;

FIGURE 2 is a perspective view of the inner framework of the FIGURE 1 structure.

FIGURE 3 is a bottom view of the FIGURE 1 shelter;

FIGURE 4 is a rear end elevation of the FIGURE 1 shelter;

FIGURE 5 illustrates the shelter of FIGURE 1 vertically positioned upon the forward end shown in FIGURE 1 and with the flat side of the shelter in the foreground;

FIGURE 6 illustrates the shelter similarly vertically positioned on one end and with the framework collapsed near the opposite end so that the end material folds within a foreshortened shelter.

Referring to FIGURE 1, a hollow tubular casing or passage **10** is formed from a straight sheet of weather-proof material, for example, canvas, which has its opposite edges joined to complete the semi-cylindrical shape. Substantially triangular end portions **12** and **14** are joined to the main body of the casing and may be cut from the same piece of material. The structure is preferably slightly tapered from the larger end wall **12**, through which access is gained by means of opening **16**, to a smaller end wall **14**. Access opening **16** is closable with a flap **18** securable to the end wall with zipper **20**.

Referring briefly to FIGURE 2, illustrating a preferred supporting structure for the convertible shelter, a first pair of long straight flexible inflatable tubes **24** and **26**, each having approximately the same length as the shelter of FIGURE 1, and spaced apart the width of flat side **22** in FIGURE 1, are secured to the inner wall of the covering material with ties as shown at **28** in FIGURE 1. A similar inflatable ridge tube **30** is tied to casing **10** between the peaks of triangular end walls **12** and **14** of FIGURE 1. A plurality of long straight inflatable tubes **32** and **33**, similar to the others except ordinarily of shorter length, are secured to the inside of casing **10**, with ties **34** (FIGURE 1), in a direction substantially perpendicular to tubes **24**, **26**, and **30**, between tube **24** and tube **26** while passing under tube **30**. Although the tubes **32** and **33** are standard straight tubes, they are subjected to a top flattening effect at **36** where ridge tube **30** is supported, and produce a bowed effect further down. This configuration results in added inside roominess as compared to the ordinary triangular tent. Tubes **32** and **33** are also

flattened where tubes **24** and **26** meet the casing **10**. Desirably, the tubes **32** and **33** are long enough to wrap around tubes **24** and **26** for added strength.

The tubes may be conveniently formed of extruded vinyl or other appropriate material each tube having a valve **38** located for convenient oral inflation thereof. The tubes are individually inflatable at will and are therefore easier for the individual to inflate than would an entire internal structure inflated at the same time. Furthermore, certain of the tubes may be inflated to a greater or lesser degree obtaining a flexibility in the shape of the shelter for purposes hereinafter more fully set out.

Referring to FIGURES 3 and 4, showing a bottom view and a rear end view respectively of the FIGURE 1 shelter, a connecting seam of closure **40** is included in a direction longitudinal to flat underside **22** and transverse to end wall **14**. This opening is in addition to the flap opening **16** provided in the opposite end wall **12**. The closing seam **40** is securable preferably by means of a tight heavy-duty zipper having waterproof material closely disposed therearound to complete a substantially weathertight seal. Zipper runners are provided at both ends.

The purpose of the seam of closure **40** will become more apparent upon consideration of FIGURES 5 and 6 illustrating the shelter supported vertically upon larger end wall **12**. In this position the seam **40** provides ingress and egress to the vertically disposed shelter. The top, **14**, of the shelter in FIGURE 5 can be left flat, or drawn together at the top with a drawstring to improve watershed. The top tube **33** is then deflated to facilitate such drawing together.

If an open top structure is required, a portion of the casing is folded inwardly providing the open top configuration shown in FIGURE 6. In the FIGURE 6 instance, both tubes **33** toward end wall **14** are preferably initially deflated in erecting the structure, while the longitudinal tubes **24**, **26** and **30** are folded back inside the structure, for example half way, thereby gaining added support. After the end portion of the casing is thus folded inwardly (as shown at **44** in FIGURE 6), the tubes **33** may be re-inflated to distend the portion of material **44** towards the side walls of the structure. Alternatively, the folded-in portion **44** may be tied to the inner side walls of the structure by means of the same ties also employed to secure one of the other tubes to the tent casing, for example, the second arched tube **32** from the left in FIGURE 2. Seam **40** is open from the top.

In either the instance of the FIGURE 5 configuration or that illustrated in FIGURE 6, the shelter obtains a plurality of additional uses; it may, for example be employed as a duck blind or deer stand warmer wherein an individual may stand vertically or crouch in await of game, the shelter affording much more protection from the elements than heretofore provided by the ordinary blind. Seam **40** in FIG. 5 may be opened as desired.

It is also observed that end **12** upon which the shelter is supported in the positions shown in FIGURES 5 and 6, contains the opening **16** usually closed in this position with zipper **20** (FIGURE 1). However, the shelter in the FIGURE 5 arrangement can be employed as an ice fishing house affording complete protection from the outside elements, wherein the flap **18** cooperating with the opening **16** is drawn completely back; the opening then facilitates access to a hole in an ice surface underneath the tent and makes possible fishing therethrough from inside the tent. Thus ice fishing can be carried on in comparative comfort without hindrance from the outside elements, even allowing the enclosure to be heated if desired.

It is thus seen that the present invention provides a multi-purpose convertible shelter having the advantages of simplicity and economy while providing utmost flexibility in the multiple uses thereof. Not only is the shelter usable as a sleeping tent, but has a multiplicity of other functions when employed vertically. For utmost flexibility the internal inflatable structure according to one aspect of the invention is comprised of a plurality of individual straight inflatable tubes removably secured to the inside of the shelter.

It will be apparent to those skilled in the art that various changes and modifications could be made in the structure disclosed without departing from the true scope and spirit of the invention.

It is therefore intended that the following claims all cover all reasonable equivalents thereof.

What is claimed is:

1. A convertible shelter comprising a hollow tubular casing of weather-resistant material having inside dimensions appropriate for receiving the human body and a supporting structure within said material casing, said supporting structure comprising a plurality of individually inflatable elongated tubes including first and second tubes extending longitudinally within said tubular casing and defining a flat portion of said casing between said first and second tubes for alternative placement on the ground, third tubes substantially normal to said first and second tubes secured to the inside of said casing opposite said flat side for distending said side when said third tubes are inflated against the restraining effect of said material and a fourth long straight tube substantially parallel to said first and second tubes and secured to the approximate middle of the distended side, said third tubes extending under said fourth tube for supporting the same.

2. The convertible shelter as recited in claim 1 further including end walls of weather-proof material, a common closable seam extending in a direction longitudinal to said casing in the flat side thereof communicating with a closable seam extending at least partially transverse to an end wall thereof, and closure means extending along both portions of said common seam for securing said seam.

3. A convertible shelter comprising a hollow tapered tubular casing having inside dimensions at least sufficient for receiving a human body and having first and second end walls, said casing being formed of weather-resistant material, a supporting structure within said casing, said supporting structure comprising a first pair of straight flexible inflatable tubes removably secured within said casing in a direction longitudinal thereto, a second straight flexible hollow tube also removably secured to the inside of said casing and longitudinal thereto defining a substantially triangular configuration with said first pair of tubes, and a third plurality of straight flexible inflatable tubes removably secured to the inside of said casing in a direction substantially normal to said first pair of tubes and second tube, said third tubes each extending from one of said first pair of tubes under said second tube and to said other of said first pair of tubes, said third plurality of tubes acting to distend said casing in an arched cross-section when said third tubes are inflated with said second tube forming the ridge of the arch, a side of said casing being provided with a closable seam.

4. The convertible shelter set forth in claim 3 wherein one end wall of said casing is provided with a crossways closable seam communicating with the closable seam in the side of said casing so that when said one of said second plurality of tubes near said end wall is substantially deflated, the material forming said end wall and adjacent side portions of said casing is foldable and securable inside the remainder of said casing in order to form a foreshortened open end shelter.

5. A convertible shelter comprising a hollow tubular casing having inside dimensions sufficient for receiving the human body including a straight sheet of weather-resistant material having a pair of opposite edges joined to form said casing, a first triangular end wall for said casing also formed of weather-resistant material, a second substantially triangular end wall for the opposite end of said casing being opposite to and substantially aligned with said first end wall but of smaller dimensions, independently inflatable straight flexible tubes extending from the

corners of said first end wall to corresponding corners of said second end wall and a second plurality of independently inflatable straight flexible tubes removably secured to the interior of said casing extending transverse to said casing and to said first tubes, at least one of said second tubes being disposed along at least two sides of each triangular end wall, closable access seams in each of said end walls, and an access seam extending at least partially longitudinally of said casing between a pair of said first tubes and communicating with the closable opening in the smaller of the two triangular end walls.

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