

May 30, 1944.

J. H. ROBINSON

2,349,833

PARACHUTE

Filed May 15, 1941

Fig. 1-

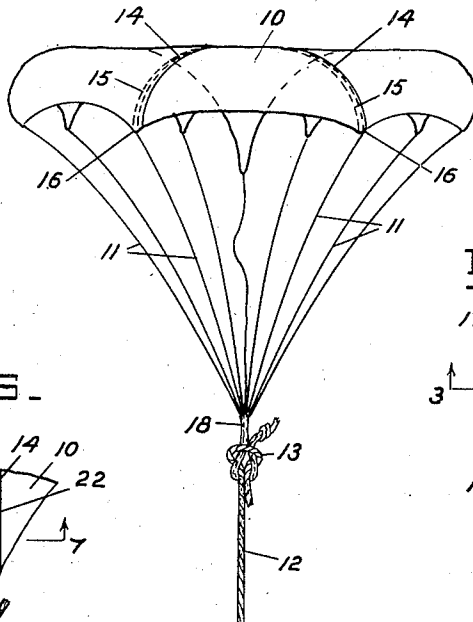


Fig. 2-

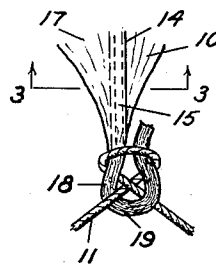


Fig. 3-

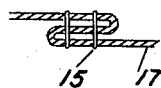


Fig. 6-

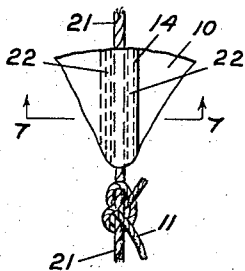


Fig. 7-

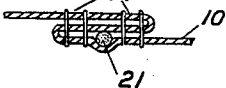


Fig. 4-

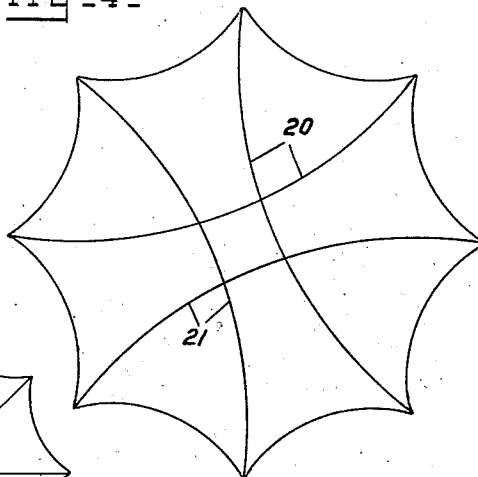


Fig. 8-

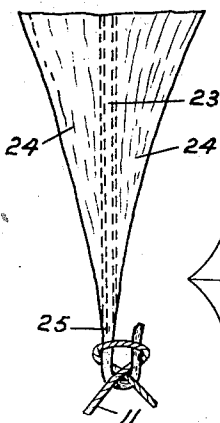
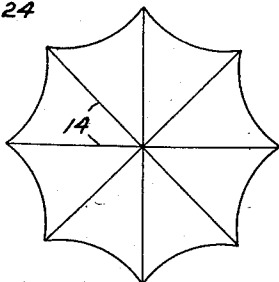


Fig. 5-



INVENTOR
James H. Robinson
BY *G. Messerschmidt & H. Church*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,349,833

PARACHUTE

James H. Robinson, Dover, N. J.

Application May 15, 1941, Serial No. 393,559

8 Claims. (Cl. 244-145)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention pertains to parachutes and has particular reference to relatively small parachute canopies for use in military pyrotechnics.

Heretofore parachutes have been constructed of tapered sectors of material which were assembled and stitched together to form a multi-section canopy. These stitched ribs reinforced the canopy and their ends served as convenient points to attach the shrouds. This method of construction involved many steps, was slow and expensive and the shroud attachment portions were not sufficiently sturdy.

Objects of the invention are to produce a canopy which can be manufactured more economically and provide strong means for anchoring the shroud lines thereto.

A complete understanding of the invention may be had by reference to the following detailed description and the accompanying drawing, in which:

Fig. 1 is a front elevation of a partly opened canopy, stays, and the suspension cord.

Fig. 2 is an enlarged, detailed view showing one manner of anchoring a shroud to the canopy.

Fig. 3 is a sectional view on the line 3-3 of Fig. 2.

Fig. 4 is a plan view of another canopy construction.

Fig. 5 is a plan view of a canopy pattern employing radial reinforcement.

Fig. 6 is a fragmentary view of a modified assembly of the canopy edge and shroud attachment.

Fig. 7 is a sectional view on the line 7-7 of Fig. 6, and

Fig. 8 is a further modification of a canopy reinforcement and shroud attachment.

In the drawing, a partially opened canopy 10 of paper or other light material has a plurality of shrouds 11 depending therefrom. These shrouds 11 are collected a convenient distance below the center of the canopy 10 and tied to a suspension cord 12 by a square or other non-slipping knot 13. Pyrotechnic or other devices (not shown) may be suspended by a suitable length of the cord 12 below the canopy 10.

In accordance with a preferred embodiment of the invention, a unitary piece of paper or other material of circular or polygonal shape is folded in such a manner as to produce a number of radial pleats 14. (Figs. 1 and 5.) The rows

of pleats 14 are then stitched longitudinally as at 15. These pleats 14 may be composed of single or multifoldings according to the degree of reinforcement which is desired to be attained. The number of pleats selected for a particular canopy is governed by the shape and size of the canopy.

The peripheral portions 16 of the canopy 10 at the zone of reinforcement are then shaped by gathering and crumpling as at 17 and attenuated to form a cord-like tail 18. The tail 18 is bent to form a bight 19 and a shroud line 11 may be tied by a suitable, non-slipping knot. Fig. 2 illustrates the use of a sheet bend knot.

Rows of non-radial, arcuate stitched pleats 20 may be employed as an alternative construction. A plan view of such a canopy pattern is shown in Fig. 4. This design likewise provides adequate reinforcement for the shroud connections.

In another modification (Figures 6 and 7), shroud lines 11 in the form of loops are employed. The cords are looped diametrically over the one-piece canopy 10 and are stitched thereto along the lines of contact. The two depending ends of each loop cord 11 are brought together at a predetermined distance below the canopy and tied to the suspension cord 12 in the usual manner. This construction eliminates the necessity of a knotted connection between the individual shrouds 11 and the canopy 10, thus saving considerable time which would ordinarily be employed in gathering and shaping at the points of attachment 15 on the canopy skirt.

The shroud loops 21 are enclosed within pleats 14 by stitching 22 on opposite sides of the loops. Figs. 6 and 7 illustrate one manner of fastening the loops 21 within the folds of the single piece sail 10. This assembly provides adequate reinforcement for the canopy and a sturdy means for retaining the shroud loops in their proper positions. In Fig. 6 one end of a shroud loop 21 is shown projecting beyond the edge of the canopy. This cord preferably extends to a point below the center of the canopy 10 where it is tied to the suspension cord 12 by a knot 13. However, it may project beyond the edge of the canopy 10 just far enough to be tied to a lighter shroud line 11 by an overhand knot as illustrated in Fig. 6.

A slight variation permits the shroud loops to be attached along non-radial arcs to a canopy having the pattern illustrated in Fig. 4.

In a simpler form of construction shown in Figure 8, a single piece canopy is reinforced with several rows of radial or arcuate stitching 23.

Pleating is unnecessary as the reinforcing stitching is generally sufficient. The peripheral portions 24 of the canopy near the stitching 23 are then gathered and shaped to create a shroud anchorage 25. Shrouds or stays 11 then may be tied to this anchorage 25. This modification has the advantage in that it is the quickest and cheapest to manufacture and yet is capable of reinforcing the canopy to withstand the tension applied to it by the forces exerted by the shrouds.

It will be understood that the embodiments herein described are merely illustrative of the invention and that the invention is limited only by the terms of the appended claims.

I claim:

1. A paper parachute canopy comprising rows of stitched reinforcement at the edges thereof, said edges being gathered at the reinforcement at spaced intervals to form shroud attaching portions.

2. A one-piece parachute canopy comprising rows of stitched reinforcement terminating at the edges thereof and substantially perpendicular thereto, and spaced, attenuated anchorages including the reinforcement for shrouds along said edges.

3. A shroud connection for a unitary web paper canopy having reinforcement comprising,

a crumpled, attenuated margin section including said reinforcements conforming to a single bight for interlocking engagement with a shroud end.

4. A one-piece paper parachute canopy comprising, rows of stitched reinforcing folds at spaced intervals around the edge of said canopy to anchor shroud lines.

5. A single piece paper canopy comprising intersecting rows of stitched reinforcing pleats reaching the edge of said canopy, said edges being gathered at the reinforced zones to form cord-shaped projections for tying to shroud lines.

6. A parachute for pyrotechnics comprising, a one-piece paper sail, and rows of stitched reinforcing folds having shroud loops sewed within.

7. A parachute for military pyrotechnics comprising a one-piece paper canopy, intersecting rows of stitched reinforcing pleats on said canopy, and an unbroken shroud line passing longitudinally through each pleat with its ends depending from the edges of said canopy.

8. A parachute comprising a one-piece paper canopy, diametrical rows of stitched reinforcing pleats on said canopy, and a shroud passing longitudinally through each pleat and projecting beyond the edge of said canopy.

JAMES H. ROBINSON.