

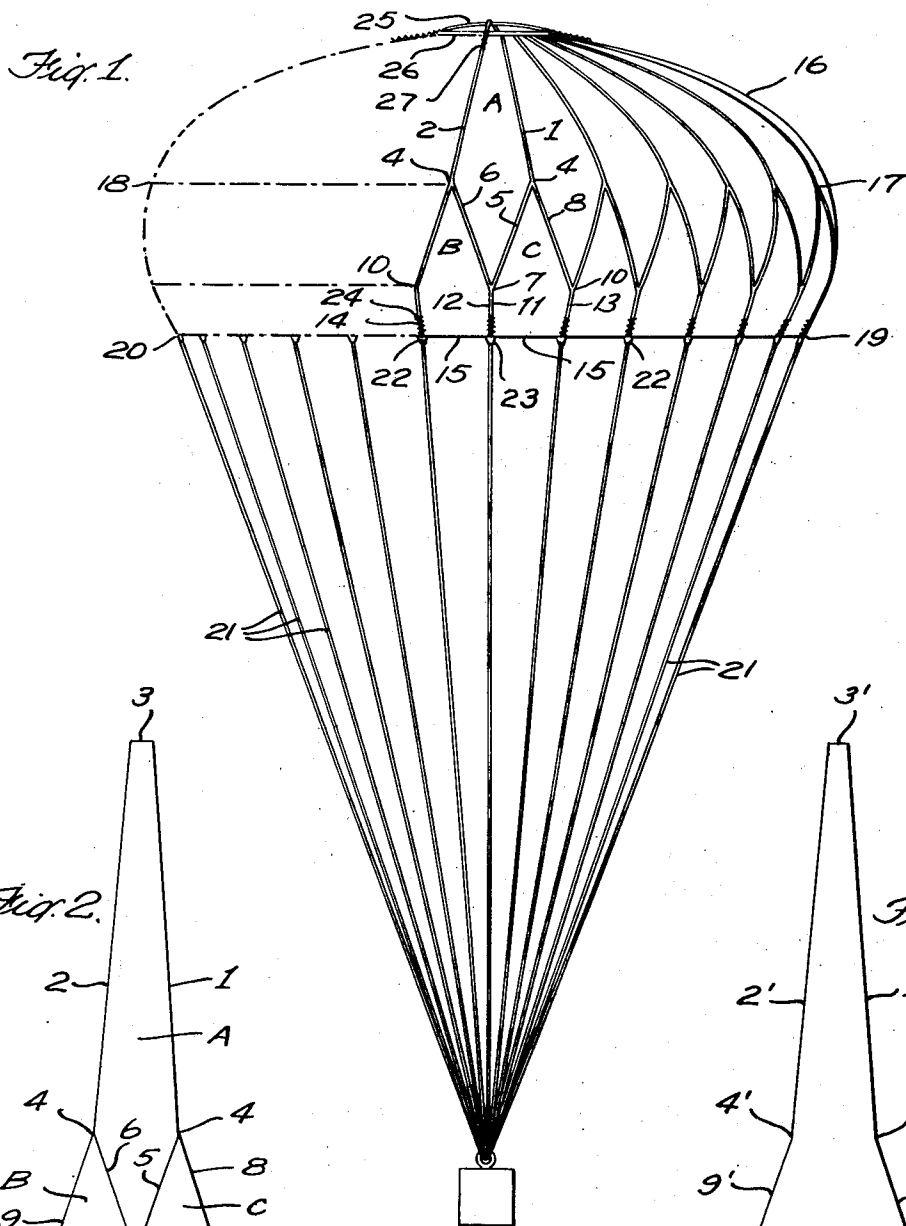
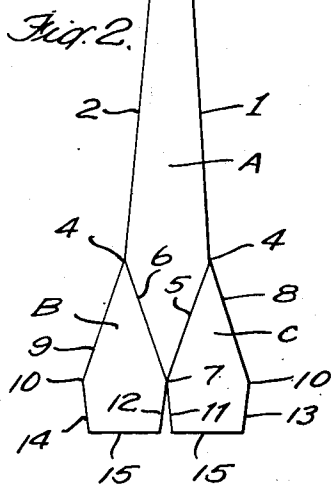
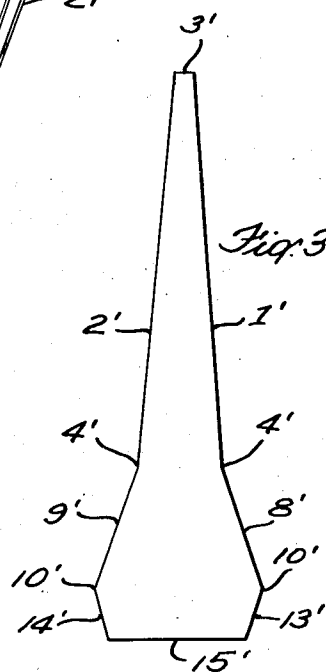
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PARACHUTE

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PARACHUTE

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This invention relates to a parachute canopy and particularly to a parachute that is adapted to be deployed from high speed airplanes.

An object of the invention is to create a canopy which, when attached to a load and deployed from a high speed airplane, will have a relatively small reefed opening at the skirt thereof and which will thereafter assume a "mushroom" shape when fully inflated, as distinguished from the standard United States Army flat circular parachute canopy, and which may have a slower descent than an equal diameter standard flat circular parachute canopy, and which may have a more stable descent than such a parachute canopy.

A further object is to provide a canopy wherein there is no main seam extending continuously in a direct line from the apex vent to the skirt.

A further object of the invention is to provide a canopy formed of polygonal shaped panels of fabric.

A still further object of the invention is to provide a polygonal composite panel which, when joined with similar panels as shown in the drawing and described in the specification, will form a "mushroom" shaped canopy in which the upper portion, when inflated, is of substantially circular curvature and the skirt portion is drawn in to a lesser diameter than the greatest diameter above the skirt toward the apex.

Other objects of the invention will be apparent as the following description progresses.

In the drawing:

Figure 1 is a conventionalized side elevation of an inflated canopy formed in accordance with my invention;

Figure 2 is a view of one of the composite panels, partly formed; and

Figure 3 is a plan view of another form of panel.

In the embodiment of the invention illustrated in the drawings, the canopy comprises a plurality of panels such as disclosed in Figure 1. As illustrated, each of these composite panels comprises sections A, B and C. The section A has two divergent edges 1 and 2 from the peak portion 3 which edges terminate at 4, their location of greatest divergence. Edges 5 and 6 converge toward each other from points 4-4 and meet at 7. The sections B and C are preferably substantially similar to each other, having two edges which substantially coincide with edges 5 and 6 and are stitched thereto. From the points 4-4 the sections B and C have divergent edges 8 and 9 which edges terminate at 10. From the point 7 the sections B and C have edges 11 and 12

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which, when the panel A-B-C is completely formed, are secured together as by stitching. Complemental edges 13 and 14 converge downwardly toward each other and each section B and C terminates at an edge 15. Thus the sections A, B and C are each of polygonal form and the panel as a whole, when the edges of the sections B and C are stitched together, is polygonal.

All of the panels of the canopy are, preferably, similarly formed and the complemental edges of edges 1, 2, 13, 14, 9 and 2 of adjacent panels are secured to the said edges of the illustrated panel and this construction is repeated to form a complete circular parachute. The series of edges 15 form the edge of the skirt of the parachute.

When the composite panels of Figure 2 are secured together by stitching, as shown in Figures 1, and the canopy inflated, the upper portion of the canopy at 16 will be of a substantially circular line from 17 to 18 and the lower or skirt portion of the canopy will curve inwardly as between 17 and 19 and 18 and 20.

So the continuation of the curvature from 17-19 and 18-20 with that from 17 to 18 might be said to form substantially an ellipse.

The thus formed canopy has seams such as indicated at 1, 2, 5, 6, 11, 8, 9, 11, 13 and 14, and which seams may be secured and reenforced in any desired and acceptably strong manner, which extend in tortuous lines from peak to skirt, that is to say, none extends in a continuous straight line from peak to skirt.

Suspension lines 21 are preferably secured to the edge of the skirt where the composite panels join together and at the junction of the sections B and C, as for instance as shown at 22 and 23 respectively in Figure 1, and may be suitably reinforced at their point of junction with the skirt by tapes.

In the embodiment illustrated in the drawings I have shown the shroud lines as extended along the seams from the skirt to a point 24 and as stitched by the conventional zigzag stitching, thus placing a suspension at each edge of each composite panel at the skirt and I have shown the lines 25 as extending along the seams at the edges 1 and 2 of sections A of the panels and over the vent 26, the lines 25 being secured by zigzag stitching as at 27.

The panel sections may each be cut on the bias if desired.

Thus it will be seen that the securing together of a plurality of the described panels will pro-

duce a canopy which is substantially "mush-room" shape, i. e., above the skirt the outline of the canopy will be a continuous curve as distinguished from the currently used standard flat top canopy and the outline of the skirt will be curved with the opening or throat of the skirt of less diameter than the greatest diameter of the major portion of the canopy. The major portion of the body of the canopy comprises elongated panel sections and a plurality of complementary panel skirt sections, each of said sections being polygonal in form. It has been found, by drop test, that a twenty (20) foot canopy described as above is more stable in dropping than the standard flat circular parachute and the average rate of descent is between that of the said standard twenty-four (24) foot canopy and the said standard twenty-eight (28) foot canopy.

I have described the panels as being of peculiar form and as made up of three polygonal sections. One of the reasons for making the panels of the three sections described is for the purpose of attaining strength.

However the panels need not be made of more than one section and my invention contemplates such a structure, and this I have illustrated in Figure 3. In either form, that is whether the panel is made up of a plurality of sections or a single section, the panel takes the effective form of two oppositely arranged geometrical figures which are substantially trapezoids having a common base. For instance, referring to Figure 2, when the edges 11 and 12 are moved together and stitched, the upper substantially trapezoidal shaped figure will be outlined by the imaginary base line between the points 10 and by the line extending from one point 10 to the point 4 around the peak to the point 4 on the other side to the point 10, while the lower substantially trapezoidal shaped figure will have the common base line between 10 and 10 and will be outlined by the edges 14, 15 and 13.

In the form shown in Figure 3 the common base line will be between 10' and 10' and the lower trapezoidal figure outlined by the edges 14', 15' and 13', while the upper trapezoidal figure will be outlined by the base 10'—10' and the edges 1', 2' and 3'.

Of course the lower trapezoidal portions of the panels may be secured together at the skirt portion of the parachute canopy in any desired manner and in the form shown in Figure 3 they may be made separate from but attached to the upper section or trapezoidal portion.

Moreover in both forms of panels the respective trapezoidal portions or sections may be made of any desired number of pieces for the purpose of strengthening or convenience of assembling and it is desirable to make the trapezoids isosceles in form, but it is to be understood that the parallel sides of the isosceles trapezoids need not be strictly parallel for they may vary in form to some degree and it is for that reason that the claims refer to the form as substantially trapezoidal.

What I claim is:

1. A composite parachute canopy panel comprising a top and two bottom sections, the top section having downwardly divergent edges of substantially equal lengths, and downwardly convergent intersecting edges extending from adjacent ends of said divergent edges, each bottom panel having intersecting, downwardly divergent edges, the point of intersection of said last men-

tioned divergent edges being substantially coincident with the adjacent end of the adjacent divergent edge of said top section, and the adjacent divergent edges of said bottom section being substantially coincident with said convergent edges of said top section, each of said bottom sections having side edges extending downwardly in converged relation to each other from the ends of the adjacent divergent edges of said bottom section and terminating in spaced relation to each other and the adjacent of said last mentioned edges being substantially coincident with each other.

2. A parachute canopy comprising a plurality of panels secured together along their side edges, each panel comprising a top and two bottom sections, the top section having downwardly divergent edges of substantially equal lengths, and downwardly convergent intersecting edges extending from adjacent ends of said divergent edges, each bottom panel having intersecting, downwardly divergent edges, the point of intersection of said last mentioned divergent edges being substantially coincident with the adjacent end of the adjacent divergent edge of said top section, and the adjacent divergent edges of said bottom section being substantially coincident with said convergent edges of said top section, each of said bottom sections having side edges extending downwardly in converged relation to each other from the ends of the adjacent divergent edges of said bottom section and terminating in spaced relation to each other and the adjacent of said last mentioned edges being substantially coincident with each other.

3. A parachute canopy comprising a plurality of panels secured together along their side edges, each panel comprising a top and two bottom sections, the top section having downwardly divergent edges of substantially equal lengths, and downwardly convergent intersecting edges extending from adjacent ends of said divergent edges, each bottom panel having intersecting, downwardly divergent edges, the point of intersection of said last mentioned divergent edges being substantially coincident with the adjacent end of the adjacent divergent edge of said top section, and the adjacent divergent edges of said bottom section being substantially coincident with said convergent edges of said top section, each of said bottom sections having side edges extending downwardly in converged relation to each other from the ends of the adjacent divergent edges of said bottom section and terminating in spaced relation to each other and the adjacent of said last mentioned edges being substantially coincident with each other, and suspension lines secured to the bottom of each panel at the side edges thereof remote from said last mentioned adjacent edges.

4. A parachute canopy comprising a plurality of top sections having downwardly divergent side edges and convergent intersecting edges extending downwardly from the lower ends of said divergent edges, a plurality of bottom sections secured to said convergent edges of said top sections and having edges converging upwardly and edges converging downwardly from said last mentioned edges.

5. A parachute canopy comprising a plurality of top sections having downwardly divergent side edges and convergent intersecting edges extending downwardly from the lower ends of said divergent edges, a plurality of bottom sections secured to said convergent edges of said top sec-

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tions and having edges converging upwardly and edges converging downwardly from said last mentioned edges, and suspension lines secured to certain of said last mentioned convergent edges.

6. A parachute canopy comprising a plurality 5 of panels extending from the peak to the edge of the skirt thereof, said panels having substantially parallel peak and base edges and having side edges diverging downwardly away from the peak and toward the skirt and terminating in spaced relation to the edges of the skirt and having also edges converging downwardly from the lower ends of said first mentioned edges toward the edge of the skirt, and means for seaming the side edges of said panels together from the 10 peak to the edge of the skirt of said canopy. 15

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