Aug. 17, 1965 G. WEBB 3,200,744

PARACHUTE

Filed March 2, 1964

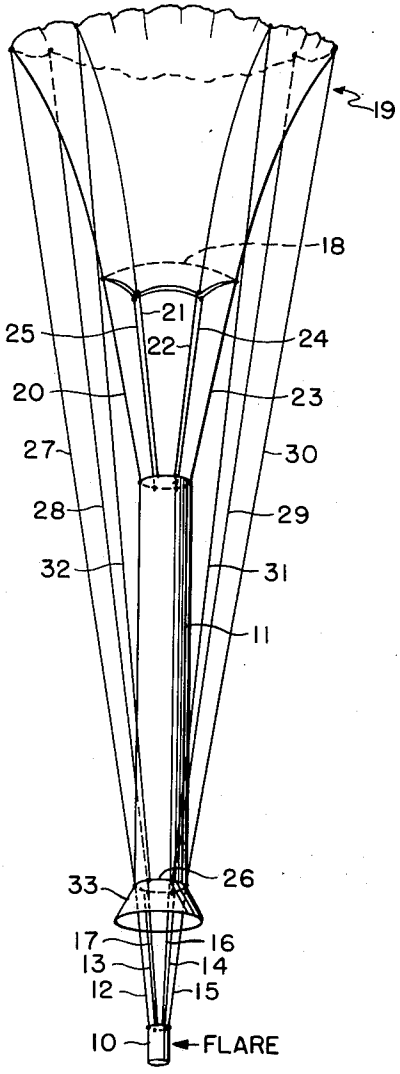


Fig 1

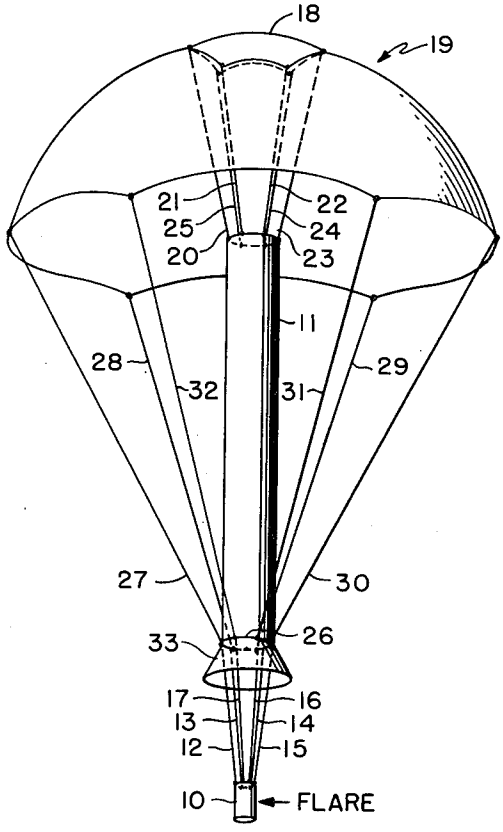


Fig 2

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PARACHUTE

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2 Claims. (Cl. 102—35.4)

The present invention relates to parachutes, and particularly to a parachute of the type intended for carrying flares.

A primary object of the invention is to provide a flare-carrying parachute which functions as a full-canopy type parachute at relatively low pressures, but pressures of a higher order gradually reef the parachute in a non-linear manner until the only element functioning as such is a portion of the canopy which is geometrically definitive of a parachute small by comparison with the entire canopy. From another point of view, shrouds which are stretched under this circumstance gradually contact fully to open out the canopy as the rate of descent of the falling flare decreases, thereby automatically to increase the air drag and to brake the speed of the falling flare.

Another object of the invention is to provide a parachute which carries a flare or other heat generating element and which is so constructed and arranged as to utilize the heat to sustain hovering.

For a better understanding of the present invention, together with other and further objects, advantages, and capabilities thereof, reference is made to the following description of the accompanying drawings, in which:

FIG. 1 is a perspective view of a parachute in accordance with the invention, showing the canopy in reefed condition; and

FIG. 2 is another perspective view showing the parachute when the canopy is in its fully open or inverted cup-shaped position.

In the particular embodiment shown, the parachute is employed for carrying a flare, generally indicated by the reference numeral 10. The flare is supported by means including a hollow flue member or heat tube 11 and a plurality of cords 12–17 connected between the flare and the lower hem of the flue and arranged in a conical configuration, the upper ends of the cords being angularly spaced from each other by 60 degrees.

A portion 18 of the canopy is geometrically definitive of a parachute which is small by comparison to the canopy member 19. Peripheral points of this portion are connected by uniformly spaced and arranged lines 20–25 to the top hem of the heat tube 11. Optionally, the lines 12–17 and 20–25 can be simply lower and upper portions of through lines extending through the flue 11.

The principal canopy 19 is deformable between the fully open position illustrated in FIG. 2 and the reefed or "morning glory" position shown in FIG. 1.

For all practical purposes the effective supporting zone is the hem 26, it being connected by cords 12–17 to the flare 10. The hem 26 is also connected by elastic and extensible cords 27–32 to 60-degree spaced points along the depending hem of the canopy 19. In a particular embodiment of the invention, the elasticity of the cords 27–32 allowed their full extension into the FIG. 1 position when the speed of the falling flare was approximately 400 feet per second at an altitude of 20,000 feet.

The element 33 is simply a heat-collecting funnel of a suitable plastic or fabric. Heat from the flare is funneled into and through the flue 11 to the underside of the main canopy. The hotter air tends to lift the canopy and to cause it to hover or maintain such a slow rate of

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descent that illumination is provided from the flare for a relatively long time.

Assume that a flare candle 10 is fired by gun or rocket at a relatively high velocity into the upper atmosphere and is then released in flight over a target area. Here it is desirable to reduce the velocity without excessive stress on the parachute and then maintain illumination of the area throughout candle burn-out. The parachute will be stressed initially into a semi-reefed—i.e., folded—attitude as indicated in FIG. 1. Then, as the velocity decreases, the strain on the extensible cords 27–32 will decrease and they will shorten gradually due to their resiliency to unreef the canopy into a fully open position. Shortly thereafter the candle will be in a fairly vertical fall. Then the heated air from the candle is funneled up the flue 11 to the underside of the canopy 19 in this position. The hotter air tends to lift the lightweight structure and cause it to hover or to slow down its fall, so that a relatively long-time area illumination is realized from the flare.

While there has been shown and described what is at present considered to be the preferred embodiment of the invention, it will be understood by those skilled in the art that various modifications and changes may be made therein without departing from the scope of the invention as defined by the appended claims.

I claim:

1. In a parachute for carrying a flare, the combination comprising:

means including a hollow flue member for supporting the flare;

a canopy member deformable between open and reefed positions;

a plurality of elastic shroud members individually connected to said canopy member at spaced boundary points, said shrouds maintaining the canopy member in fully open position in response to relatively low air pressures exercised against said canopy member, but said shrouds stretching to permit reefing of said canopy member in response to large air pressures;

and a plurality of spaced lines between said flue and spaced points bounding a portion of said canopy member which is geometrically definitive of a parachute small by comparison with the canopy member,

whereby as the ensemble is dropped into space the flare falls rapidly and is braked solely in the small parachute until a decrease in pressure under the canopy member permits the elastic shrouds to contract and fully to open up the canopy member, whereupon the flare hovers and transmits heat through the flue to prolong hovering.

2. In a parachute for carrying a flare, the combination comprising:

means including a hollow flue member for supporting the flare, said hollow flue member having a lower end terminating in an inverted funnel above and vertically spaced from the burning surface of the flare;

a canopy member deformable between open and reefed positions;

a plurality of elastic shroud members individually connected to said canopy member at spaced boundary points, said shrouds maintaining the canopy member in fully open position in response to relatively low air pressures exercised against said canopy member, but said shrouds stretching to permit reefing of said canopy member in response to large air pressures;

and a plurality of spaced lines between said flue and spaced points bounding a portion of said canopy member which is geometrically definitive of a minor parachute small by comparison with the canopy member,

whereby as the ensemble is dropped into space the flare falls rapidly and is braked by the minor parachute until a decrease in pressure under the canopy member permits the elastic shrouds to contract and fully to open up the canopy member, whereupon the flare hovers and transmits heat through the flue to prolong hovering.

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