

Dec. 21, 1943.

D. B. HASTINGS

2,337,192

PAPER PARACHUTE

Filed Jan. 1, 1943

2 Sheets-Sheet 1

Fig. 1

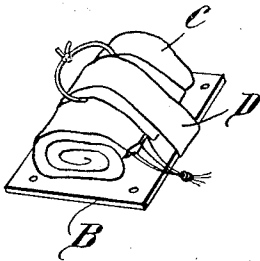


Fig. 2

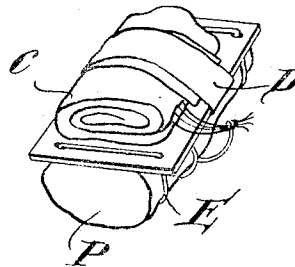
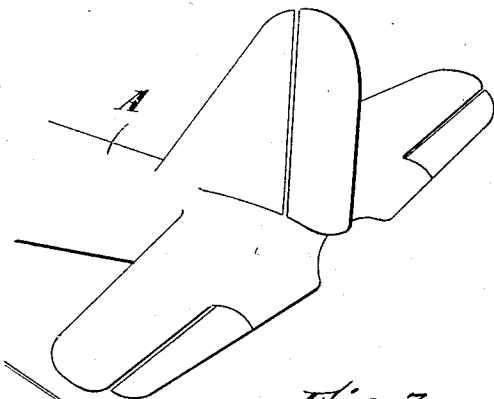


Fig. 3

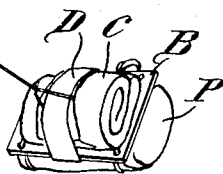


Fig. 5

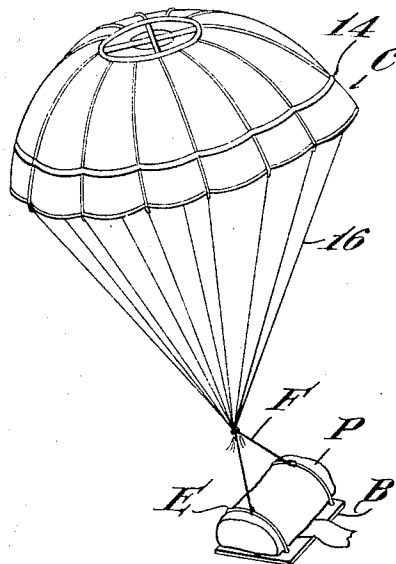
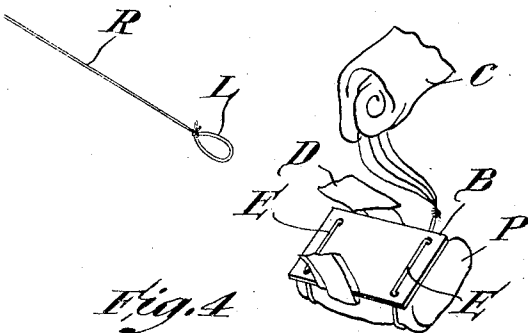


Fig. 4

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Fig. 6

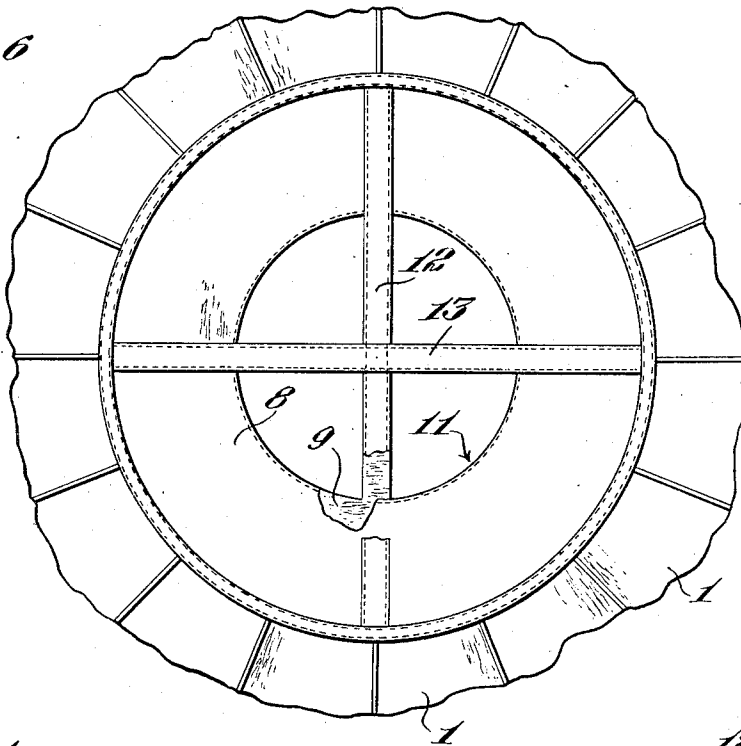


Fig. 7

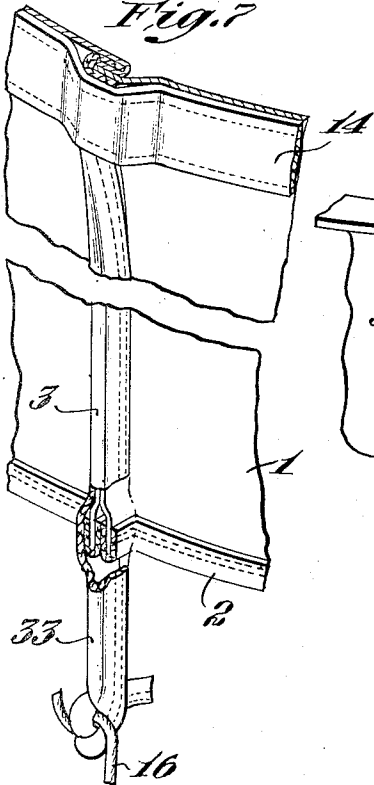
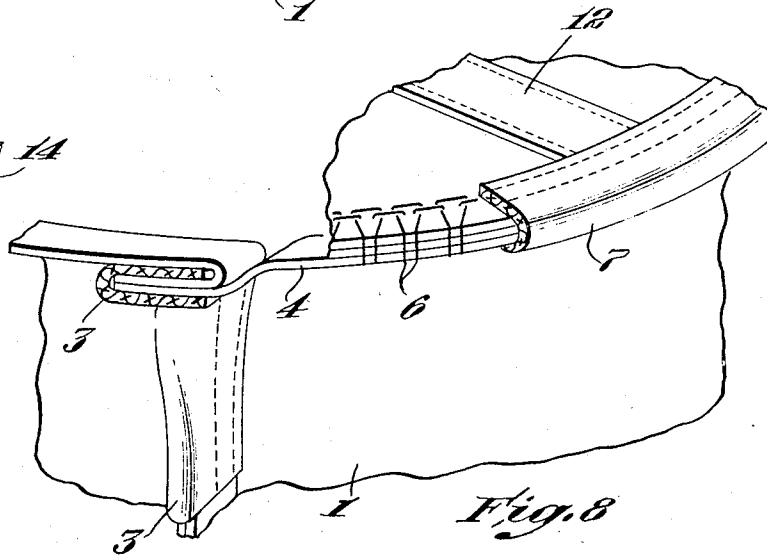


Fig. 8

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UNITED STATES PATENT OFFICE

2,337,192

PAPER PARACHUTE

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Application January 1, 1943, Serial No. 471,047

7 Claims. (Cl. 244—145)

In the art of aeronautics it is often desirable to drop articles of various kinds by parachute, and in time of war there is of course far greater need for such practice, particularly for dropping food and other supplies to service men in inaccessible places. However the practice has been greatly restricted heretofore by the cost of parachutes.

Objects of the present invention are to provide a parachute which is inexpensive in construction, which will carry substantial loads, which requires only materials which are cheap and plentiful, which can be manufactured rapidly and economically, and which is reliable in operation.

According to the present invention the parachute comprises a plurality of segments of crepe paper having the creping extending lengthwise of the segments, the lower edges of the segments being reinforced and the adjoining margins of the segments being disposed in abutting relationship, in combination with radial tapes secured to the abutting margins and support cords having their upper ends secured to the lower ends of the radial tapes. The tapes preferably have extensions depending from the lower edges of the segments for attachment to the aforesaid support cords. In the preferred form of the invention an opening is left at the top of the parachute and a tape is bound over the upper edges of the segments. The open top may be further reinforced by a top ring having its outer periphery secured to the upper edges of the segments, preferably by cross-stitching with the tape secured over the cross-stitching. The top may also have reinforcing straps extending across the aforesaid opening in angular relationship to each other.

By employing crepe paper with the creping extending lengthwise of the segments, the shock of opening does not split the parachute even though it is made of paper which tears fairly easily; and by securing the load-carrying cords to the lower ends of the radial tapes which are secured to both edges of each pair of abutting segments, the load is distributed throughout the area of the parachute so uniformly that the paper does not tear when carrying loads up to 25 pounds and even greater.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawings in which

Fig. 1 is a perspective view of an open parachute attached to a board;

Fig. 2 is a similar view showing a package attached to the other side of the board;

Fig. 3 is a view of the combined package and parachute being dropped from an airplane;

Fig. 4 is a similar view showing the parachute unfolding;

Fig. 5 is a view of the parachute and package after the parachute has completely unfolded;

Fig. 6 is a top plan view of the top portion of the parachute; and

Figs. 7 and 8 are detail views of parts of the parachute.

In the particular embodiment of the invention chosen for the purpose of illustration C designates the parachute, P the package to be carried by the parachute, B the board to the opposite sides of which the parachute and package are attached and A an airplane from which the parachute and package are dropped. The parachute is attached to one side of the board by means of a paper band D which surrounds the parachute and board, the parachute preferably being attached to the board before the package is secured in place. The package is preferably secured by two cords E which pass through openings in the board and thence around the package. The parachute may be attached to the cords E by means of two other cords F. For the purpose of permitting the parachute to open after it leaves the airplane a rip cord R has one end secured to the airplane and the other end provided with a loop L surrounding the paper band D so as to break the band as shown in Fig. 4. By attaching the parachute as above described the load is on the upper side of the board during the descent of the parachute as illustrated in Fig. 5. Thus, there is less danger of damaging the contents of the package when it lands because the board is on the under side.

The preferred embodiment of the parachute shown in the drawings comprises segments 1 of crepe paper having the creping extending lengthwise of the segments, that is radially of the parachute, as indicated by the shading in Fig. 6. Before the segments are secured together tapes 2 are bound over the lower edges of the segments respectively. Then the adjacent edges of the segments are bent outwardly at right angles into abutting relationship and tapes 3 are stitched over these abutting edges and over the ends of the bottom tapes 2. After the segments have been joined together in this manner the upper edge of the body of the parachute is bent outwardly as indicated at 4 in Fig. 8 and this bent edge is secured by cross-stitching 6 to the outer periphery of the top of the parachute. The cross-stitched edges are then bound with a tape 7 which extends over the upper ends of the radial tape 3 and is stitched thereto.

The top part of the parachute preferably comprises two circular pieces 8 and 9 of crepe paper, with the creping extending in different directions in the two layers as indicated by the shading in Fig. 6. Extending across the top of the parachute are two straps 12 and 13 which are stitched to the top, and to each other at their intersection, with their outer ends bound under the tape 7. To relieve the shock when the parachute opens and to stabilize the parachute as it descends, the

top preferably is provided with an opening 11 to permit the escape of air. To prevent distortion of the top during manufacture one of the layers 8 and 9 is preferably not cut out until after all the parts have been stitched together. Then the four segments between the straps are cut out. Thus the material of one layer, the layer 9 in Fig. 6, has bridging portions on the under sides of the straps 12 and 13, whereas the upper layer 8 is entirely open with no portions bridging the opening 11. After the parts are secured together as above described a reinforcing tape 14 may be stitched to the outside of the parachute near the lower edges of the segments where the circumferential strain is the greatest.

As shown in Fig. 7 the radial tapes 3 preferably have extensions 33 extending below the lower edges of the segments 1 for attachment to the cords 16; and as shown in Fig. 5 the lower ends of the cord 16 are secured together and to the two cords F leading to the load.

From the foregoing it will be evident that even though the parachute is made of material which tears easily and even though the shock of sudden opening is severe, this construction affords safe landings, particularly because of the creping lengthwise of the segments and the attachment of the support cords to the radial tapes which in turn are secured to each of the tapes which extend circumferentially of the parachute, whereby the load is distributed uniformly throughout all the segments.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, reinforcement at the lower edges of the segments, the adjoining margins of the segments being disposed in abutting relationship, radial tapes secured to said abutting margins, and support cords having their lower ends secured together and their upper ends secured to the lower ends of said radial tapes respectively.

2. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, reinforcement at the lower edges of the segments, the adjoining margins of the segments being disposed in abutting relationship, radial tape secured to said abutting margins, the radial tape having extensions extending below the lower edges of the segments, support cords having their lower ends secured together and their upper ends secured to said extensions respectively, and top tape folded over the upper edges of said segments and stitched thereto.

3. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, bottom tape folded over the lower edge of each segment and bound thereto, the adjoining margins of the segments being bent into abutting relationship, radial tape folded over said abutting margins and bound thereto, the radial tape having extensions extending below the lower edges of the segments, support cords having their lower ends secured together and their upper ends secured to said extensions respectively, and top tape folded over the upper edges of said segments and stitched thereto.

4. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, bottom tape folded over the lower edge of each segment and bound thereto, the adjoining margins of the segments including said bound edges being bent into abutting relationship, radial tape folded over said abutting margins and bound thereto, the radial tape having extensions extending below the lower edges of the segments, support cords having their lower ends secured together and their upper ends secured to said extensions respectively, and top tape folded over the upper edges of said segments and stitched thereto.

5. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, bottom tape folded over the lower edge of each segment and bound thereto, the adjoining margins of the segments including said bound edges being bent into abutting relationship, radial tape folded over said abutting margins and bound thereto, the radial tape having extensions extending below the lower edges of the segments, support cords having their lower ends secured together and their upper ends secured to said extensions respectively, a circular top, the adjacent edges of said top and said segments including the upper ends of said radial tape abutting each other and being cross-stitched together, and top tape folded over said cross-stitched edges and stitched thereto.

6. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, bottom tape folded over the lower edge of each segment and bound thereto, the adjoining margins of the segments including said bound edges being bent into abutting relationship, radial tape folded over said abutting margins and bound thereto, the radial tape having extensions extending below the lower edges of the segments, support cords having their lower ends secured together and their upper ends secured to said extensions respectively, a circular top having a central opening therein, reinforcing straps extending across the top in angular relation to each other and stitched thereto, the adjacent edges of said top and said segments including the upper ends of said radial tape and the outer ends of said straps abutting each other and being cross-stitched together, and top tape folded over said cross-stitched edges and stitched thereto.

7. A parachute comprising a plurality of segments of crepe paper having the creping extending lengthwise thereof, bottom tape folded over the lower edge of each segment and bound thereto, the adjoining margins of the segments including said bound edges being bent into abutting relationship, radial tape folded over said abutting edges and bound thereto, the radial tape having extensions extending below the lower edges of the segments, support cords having their lower ends secured together and their upper ends secured to said extensions respectively, a circular top formed of two layers of crepe paper, the central portion of at least one layer being cut out to form an opening therein, reinforcing straps extending across the top in angular relation to each other and stitched thereto, the adjacent edges of said top and said segments including the upper ends of said radial tape abutting each other, said adjacent edges being cross-stitched together, and top tape folded over said cross-stitched edges and stitched thereto.

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