Oct. 9, 1956 C. S. KOWALSKI 2,765,995

PARACHUTE PACK

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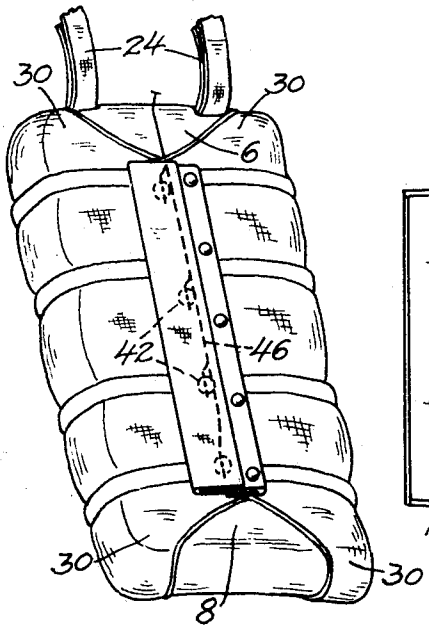


Fig. 1.

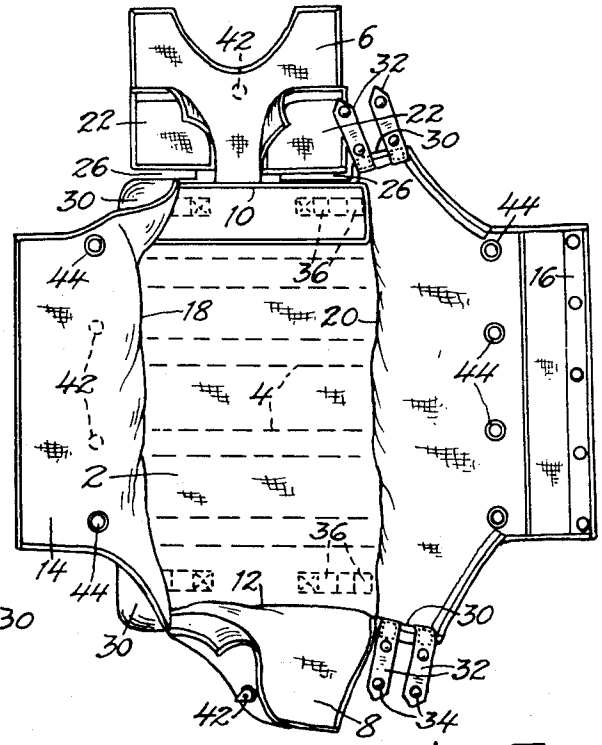


Fig. 2.

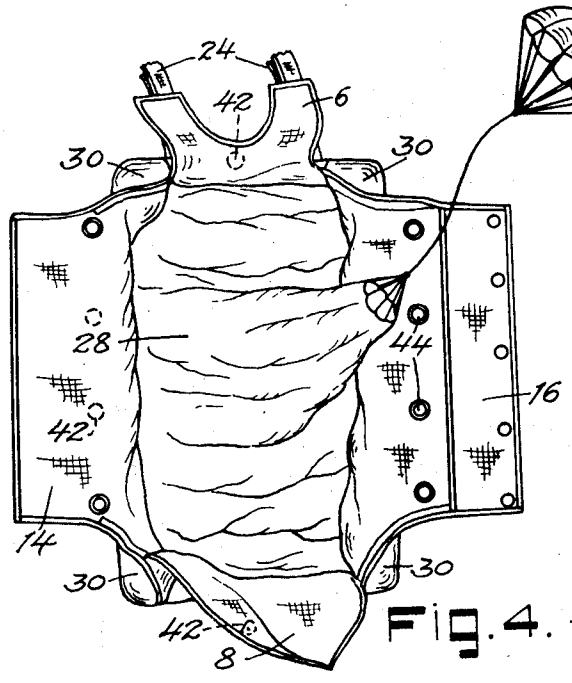


Fig. 4.

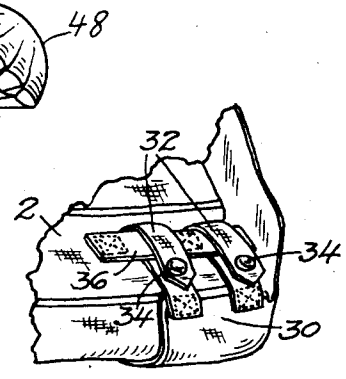


Fig. 3.

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PARACHUTE PACK

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12 Claims. (Cl. 244—148)

This invention relates to parachute packs and is directed particularly to a novel type of pack cover by which a parachute may be enclosed within a pack.

It has been usual practice heretofore to provide a parachute pack with a back or base portion upon which the shroud lines and parachute canopy are arranged. The pack further is provided with various side and end flaps which are secured to the edges of the base portion and arranged to extend into overlapping relation on the front of the pack for release by a rip cord, static line or other actuating means when it is desired to release the parachute. The edges of some of the flaps are necessarily exposed to the air stream when the pack is in use and an effort is therefore made to draw the flaps down tightly in packing the parachute. However, even when the packing is done by a skilled technician the edges of the flaps adjacent the corners of the pack often bulge outward or pucker in a manner to form air pockets. When a parachute pack having even small air pockets is exposed to the air stream at about 250 to 400 miles per hour, the air tends to catch in such air pockets and causes the flaps to tear or to be withdrawn so as to allow the canopy to be prematurely or improperly released from the pack.

The manner in which the pack flaps have been formed and released heretofore also allows the entire canopy to be dumped from the pack so as to be exposed to the air stream while still in a folded or partially folded condition. When this occurs, the skirt of the canopy may whip over the upper portion of the canopy so as to invert the canopy, or lines may be thrown over the canopy or they may become entangled so as to prevent full or proper opening of the parachute.

In accordance with the present invention, a pack cover is provided with a novel arrangement of pack flaps or other enclosing means which serve to prevent or eliminate the formation of air pockets adjacent the edges of the flaps or at the corners of the pack. In particular, the construction serves to aid in retaining the pack flaps in such parachute enclosing relation after release thereof, that the canopy will be drawn out of the pack by the pilot chute in an orderly manner and thereby reduce or eliminate tangling of the lines or inversion of the canopy.

These results are preferably attained by connecting one or more of the pack flaps to the base along one side and at least a portion of another side of the base so that the flap will extend about and over a corner of the pack. The pack further is preferably formed with an adjacent flap arranged to extend beneath the corner forming portion of the first flap so that it will have to be withdrawn from beneath the first flap in order to open the pack completely. In this way, the corner of the pack will be neatly and smoothly closed and the extension of the underlying flap will be securely held in place when the pack is closed. At the same time, the construction restricts release of the parachute canopy and shroud lines from the pack to a sufficient extent to prevent dumping of the folded canopy into the air stream

and to insure orderly deployment of the parachute at either high or low speeds and under all conditions of use.

One of the objects of the present invention is to provide an improved form of parachute pack adapted for use at either high or low speeds.

Another object of the invention is to provide a parachute pack with a cover which will present a minimum of air pockets adjacent the edges of the flaps enclosing the parachute.

A further object of the invention is to provide a parachute pack having an improved corner construction serving to prevent premature or improper release of the pack flaps or parachute canopy from the pack.

These and other objects and features of the present invention will appear from the following description thereof in which reference is made to the figures of the accompanying drawing.

In the drawing:

Fig. 1 is a perspective showing a typical form of parachute back pack embodying the present invention;

Fig. 2 is a plan view of the parachute pack cover embodied in the pack of Fig. 1;

Fig. 3 is a perspective illustrating a corner portion of a parachute pack shown in Fig. 1 as seen from the rear; and

Fig. 4 illustrates the partially opened pack of Fig. 1 with a canopy being withdrawn therefrom.

In that form of the invention chosen for purposes of illustration in the drawing, the parachute pack is illustrated as being a back type pack which is generally rectangular in shape. The base **2** of the pack may be provided with spreader members indicated at **4** for maintaining the base of the pack in a laterally extended condition so that the pack will be relatively flat when in a closed form ready for use but will be flexible in a direction lengthwise of the pack. End flaps **6** and **8** are connected along their edges to the opposite ends of base **2** as shown by the seams **10** and **12** respectively, whereas side flaps **14** and **16** are connected to the base of the pack along seams indicated at **18** and **20**, respectively.

The end flap **6** is preferably of a generally T-shaped construction and is attached to the end of the base along a relatively short seam **10**. The opposite sides of the end flap **6** extend beyond the ends of the seam **10** so as to form wings **22** which extend outward toward the corners of the base **2**. When the pack cover is closed, the lift webs **24** attached to a canopy enclosed in the pack extend outward through the slot **26** between the adjacent end of the base **2** of the pack and the wing **22** of the end flap **6**. The lift webs may, of course, be attached to a parachute harness or load in any suitable way.

The lower end flap **8** of the pack cover may be similar to end flap **6**, but preferably is secured to the base throughout substantially the entire length of the lower end of the base by the seam **12**. The lower end flap **8**, like upper end flap **6** is designed to extend to the corner of the pack. Both end flaps are designed to be folded inward so as to cover and overlie the folded parachute canopy **28** and the shroud lines located upon the base **2** of the pack.

The side flaps **14** and **16** of the pack cover extend the full length of the base of the pack and are provided with extensions indicated at **30** which project beyond the ends of the base of the pack. Retaining means which may consist of one or more fabric straps **32** are carried by the extensions **30** and may be provided with releasable fastening means such as the snap fasteners **34**. The base of the pack near such corner thereof is formed with a cooperating retaining means **36** for receiving and holding the straps or retaining means **32** on the extensions **30**. The retaining means **36** on the base of the pack may con-

veniently consist of fabric straps secured at their opposite ends to the base of the pack but disconnected from the base between the opposite ends thereof so that each strap will present a loop beneath which the retaining straps 32 on extensions 30 may be passed.

As shown in Fig. 3, when the side flaps 14 and 16 are folded inward over the base the extensions 30 may be folded forward over the ends of the base and into a position such that the straps 32 may be passed downward beneath the loop formed by the adjacent retaining means 36 and thence folded upward to permit engagement of the snap fasteners 34 with each other to hold the extensions securely in place. Instead of using releasable fastening means as shown, the straps 32 may be secured in place by break threads or may be permanently secured in the position shown so that the extensions 30 will extend about and over the corner of the pack forming a canopy retaining pocket into which a portion of the folded canopy 28 may be inserted in stowing a parachute in the pack.

The side flaps 14 and 16 may be provided with conventional cones 42 and grommets 44 or other means for securing the side flaps in pack closing relation. However, the side flaps are releasable by means of a rip cord 46 or otherwise to permit the parachute canopy and shroud lines to be withdrawn from the pack.

In using the pack cover shown and described above, the shroud lines and canopy of the parachute may be folded and arranged for stowage within the pack in any suitable or conventional manner. The shroud lines preferably are arranged in groups and stowed beneath the looped bands which extend lengthwise of the base of the pack near the opposite sides thereof. The canopy in turn is placed upon the stowed shroud lines and preferably is folded back and forth upon itself in folds which are substantially as long as the base of the pack cover. In this way, the folded parachute canopy extends all the way to the corners of the base of the pack.

The end flaps 6 and 8 are then folded inward over the parachute canopy with the wings 22 of the end flaps 6 extending substantially to the corners of the pack. The inwardly folded lower end flap 8 extends across the full width of the lower end of the pack. The side flaps 14 and 16 of the pack cover are then folded inward over the end flaps 6 and 8 and the cones 42 are inserted through the grommets 44 and releasably held in place by the rip cord 46. The pilot chute 48 may be enclosed within the flaps of the pack cover beneath the side flaps if desired, or the pilot chute may be housed in an external compartment on the pack cover.

After the end and side flaps have been closed and held in place, the extensions 30 on the side flaps are drawn rearward over and about the ends of the pack and the straps 32 are passed beneath the loops 36 and then folded back so as to permit the snap fasteners 34 to be engaged for holding the extensions 30 securely in place. The extensions 30 thus serve to form pockets adjacent the corners of the pack and within which the outer edges of the end flaps and the corner portions of the folded parachute canopy are housed. In this way, the side flaps may be drawn down and tightened after the pack has been closed so as to eliminate any puckering of the edges of the flaps which might otherwise exist. The danger of the air stream entering beneath the edges of the flaps so as to cause tearing of the flaps or to withdraw them prematurely from the closed position is thereby reduced.

The construction of the present invention has the further advantage of yieldably retaining the parachute canopy within the pack cover after the flaps have been released by the rid cord or other releasing means. Thus, the overlapping corner formation provided by the extensions 30 restricts the outward or unfolding movement of the side and end flaps and affords retaining pockets at each corner of the pack from which the parachute canopy must be withdrawn as it is pulled out of the pack by the pilot chute. The restraining of the side and end flaps by the corner forming extensions 30 prevents the pack from being dumped out bodily or while in a folded condition. Instead, the yieldable retention of the canopy renders it necessary for the pilot chute to pull out the canopy to its full length before the skirt of the parachute is exposed to the air stream. The skirt, therefore, cannot whip upward about a folded portion or the peak of the canopy so as to invert the parachute or cause shroud lines to be thrown over or injure the canopy.

The measure of restriction to release the parachute from the pack cover will depend somewhat upon the width of the extensions 30 and the depth of the corner pockets formed thereby. By suitable proportioning of the extensions 30, the present invention may serve to afford somewhat the same restriction which has heretofore been provided by the use of an extra skirt retaining member or "quarter-bag" applied to the canopy within the pack. The restriction placed upon the release of the canopy from the pack further serves to delay somewhat the opening of the parachute canopy and thereby provides a greater degree of deceleration of the parachute and its load whereby the opening shock to which the canopy and load is subjected are substantially reduced. At the same time, the delay afforded is insufficient to endanger the user even when the parachute is employed at relatively low speeds and low altitudes.

While the invention has been shown and described above as embodied in a back type pack, the invention may also be used in combination with pack covers for seat packs, cargo parachutes, and other constructions. The manner in which the pilot chute is stowed within or upon the parachute pack may be varied and, of course, any type of parachute canopy and pilot chute may be enclosed within the pack cover. In view thereof, it should be understood that the particular form and construction of the pack cover shown in the drawings and described above in intended to be illustrative only and is not intended to limit the scope of the invention.

What I claim is:

1. A parachute pack having a cover comprising a generally rectangular base, pack closing flaps each having an edge thereof fixedly secured to said base along a side of the base, means on said flaps for releasably holding the flaps in pack closing relation, at least one of said flaps having an unsecured portion extending beyond the edge of the base to which said flap is secured and foldable about and over a corner of the base, and means for detachably holding said portion in a position to overlie at least a part of an adjacent flap when said flaps are released.

2. A parachute pack cover having a base of generally rectangular shape and pack enclosing flaps each having an edge thereof fixedly secured to said base along an edge of the base, said flaps being arranged to be folded into overlapping relation to enclose a parachute within the pack cover, at least one of said flaps having an unsecured portion which extends beyond the edge of the base to which said flap is secured and foldable about a corner of the base, and means on said base engageable by said portion for holding said portion in position to overlie a part of an adjacent flap.

3. A parachute pack cover having a base of generally rectangular form, side flaps and end flaps each of which has an edge thereof fixedly secured to said base and having free edges foldable into overlapping relation to enclose a parachute canopy therein, each of said side flaps having an unsecured extension thereon extending beyond the secured edge thereof and foldable about a corner of said pack, and means for detachably holding said extensions in position to cover the corners of said pack.

4. A parachute pack cover having a base of generally rectangular form, side flaps and end flaps fixedly secured to the edges of said base and foldable into overlapping

relation to enclose a parachute canopy therein, means releasably holding said flaps in parachute enclosing position, said side flaps having unsecured extensions extending beyond the opposite ends of the edge of the base to which the flap is secured and foldable about and over the corners of said pack, said end flaps having portions which are arranged to be positioned beneath said extensions adjacent the corners of the pack when said flaps are in parachute enclosing position, and means for holding said extensions in corner covering position when said flaps are released.

5. A parachute pack cover having a base of generally rectangular form, side flaps and end flaps secured to said base and foldable into overlapping relation to enclose a parachute canopy therein, means releasably holding said flaps in parachute enclosing position, said side flaps having unsecured extensions thereon foldable about and over the corners of said pack, and cooperating means on said extensions and base for holding said extensions in corner covering position, said end flaps being arranged to lie beneath said extensions when the pack cover is closed and yieldably held in place by said extensions when said flaps are released.

6. A parachute pack cover of the character defined in claim 3 wherein there are retaining means carried by said base, and straps on said extensions engageable with said retaining means for securing said extensions in corner covering position.

7. A parachute pack comprising a cover having a generally rectangular base, a parachute canopy located on said base and arranged with portions of the canopy extending substantially to the corners of said base, pack closing flaps fixedly secured to said base and extending into position to enclose said parachute canopy within said cover, means releasably holding said flaps in said position, corner forming means on at least a portion of said flaps extending freely beyond the corners of the base and foldable about and over said corners of the base, and cooperating means carried by said corner forming means and base for holding said corner forming means in position to overlap and restrain movement of an adjacent flap when said flaps are released.

8. A parachute pack comprising a cover having a base of generally rectangular form, a parachute canopy enclosed within said cover and arranged with portions thereof extending substantially to the corners of said base, flaps secured to said base and folded inward into overlapping relation to enclose said parachute canopy within said cover, means for releasably holding said flaps in parachute enclosing relation, and freely extending corner forming means on at least a portion of said flaps foldable about and over said corners of the pack in position to overlie adjacent flaps and form pockets adjacent the corners of the pack into which the parachute canopy extends and cooperating means carried by said corner forming means and base for securing said corner forming means in corner covering position.

9. A parachute pack comprising a cover having a base of generally rectangular form, a parachute canopy enclosed within said cover and arranged with portions thereof extending substantially to the corners of said base, end flaps secured to said base and folded inward over the parachute canopy with corner portions of the end flaps extending substantially to the corners of the base, side flaps secured to said base and folded inward over said end flaps, means on said side flaps releasably holding all of said flaps in parachute enclosing relation, and means carried by said side flaps detachably connectable with said base for restraining outward movement of the corner portions of the end flaps when said flaps are released.

10. A parachute pack comprising a cover having a base of generally rectangular form, a parachute canopy enclosed within said cover and arranged with portions thereof extending substantially to the corners of said base, end flaps secured to said base and folded inward over the parachute canopy with corner portions of the end flaps extending substantially to the corners of the base, side flaps secured to said base and folded inward over said end flaps, means on said side flaps releasably holding all of said flaps in parachute enclosing relation, extensions on said side flaps projecting beyond the corner of said base but folded over and about the ends of said base and serving to form pockets at the corners of said pack within which said portions of the parachute canopy and said corner portions of the end flaps are located, and means on said base holding said extensions in said pocket forming positions when said flaps are released.

11. A parachute pack cover having a rectangular base, a cover flap secured to a side of said base throughout the length of said side, said cover flap having a corner covering extension projecting beyond the corner of the base and the adjacent end of the side to which the flap is secured, said base and extension having means releasably connecting the same for holding said extension in corner covering relation with respect to said base.

12. A parachute pack cover having a rectangular base, a cover flap secured to a side of said base throughout the length of said side, said cover flap having a corner covering extension projecting beyond the corner of the base and the adjacent end of the side to which the flap is secured, said extension having releasable fastening means thereon, and said base having complementary fastening means located adjacent said corner and in position to hold said extension in corner covering relation with respect to said base.

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