

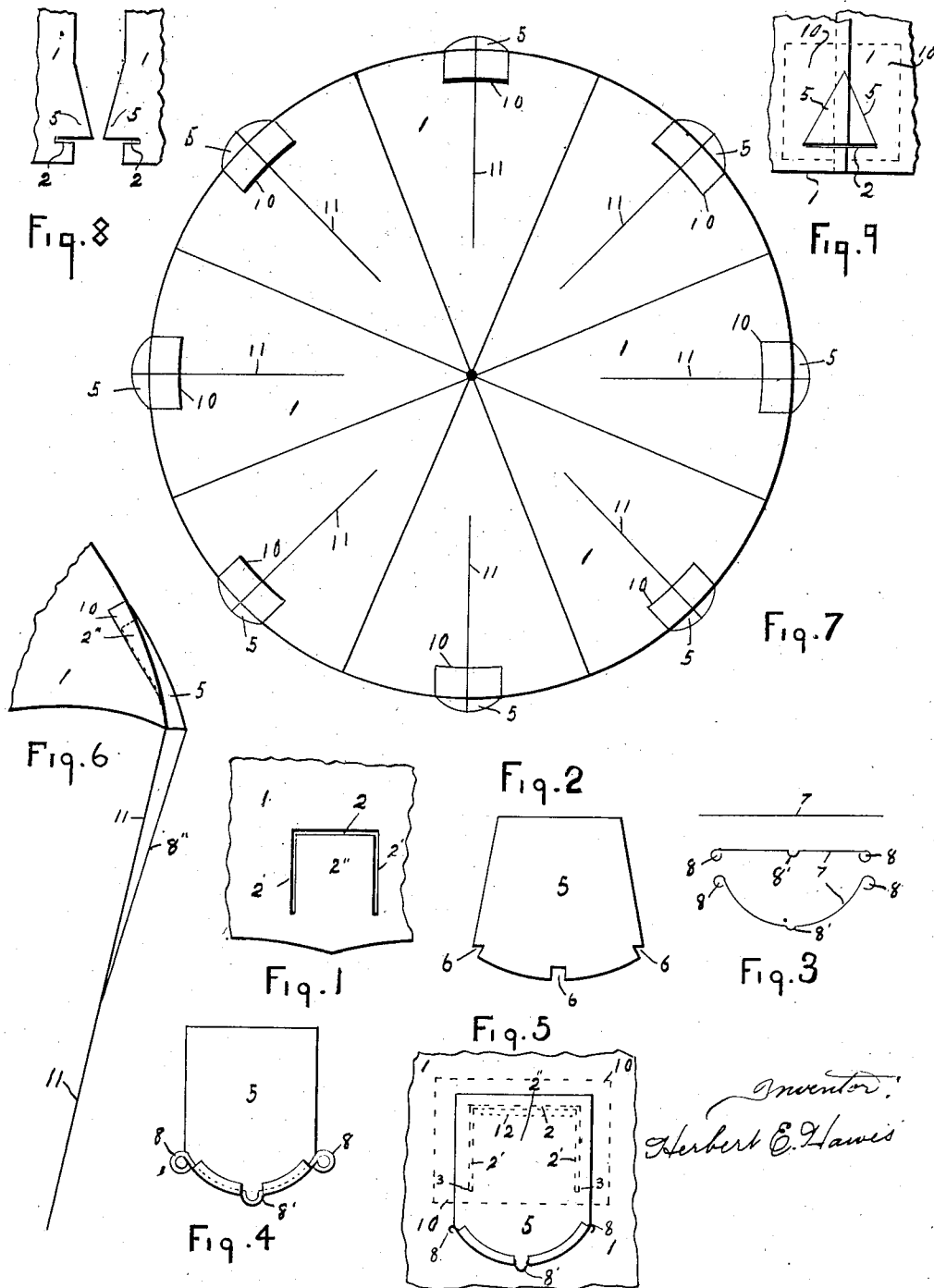
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PARACHUTE

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PARACHUTE.

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My invention relates to improved means for, and method of, spreading or launching parachutes, particularly that type which is folded in a small pack, and lashed to the aviator's back, and is released therefrom by a rip-cord pulled by the aviator, and adapted to liberate the means by which it is fastened. Said pack, or receptacle for carrying the parachute, the aviator-harness, and pilot-chute, all being well known elements and in every day use, are not described in detail herein.

It may also be used to expand a parachute carried or held in any other manner, or attached to, or held by, any suitable means; or likewise a pilot-chute.

The object of this invention is to supply a simple, light, positively acting device, under control of the aviator, to open the bottom of a parachute to the action of the atmosphere after leaving the aircraft, and which will function automatically. I attain these objects by the particular form, size, and disposition of the several parts thereof, and like numerals designate like parts in the several views.

Referring to the drawings forming a part of this application,

Figure 1, is a side elevation of a portion of a parachute-skirt, having an air-passage cut therein.

Figure 2, is a side view of one of the spreading-pockets or flaps.

Figure 3, is a detail view of successive stages in the construction of one of the pocket distending-wires.

Figure 4, is a side elevation of one of the spreading-pockets with a distending-member sewed in place in the bottom of same.

Figure 5, is a detail showing the location of a check-flap over an air-passage in a skirt, and is shown by dotted lines on the inside thereof.

Figure 6, is a detail, in side elevation, showing one of the spreading-pockets attached to a portion of a parachute-skirt, and a flap-positioning cord leading to one of the suspensory guys, from the bottom of a spreading-pocket.

Figure 7, is a bottom view of a parachute with a plurality of spreading-pockets at-

tached thereto, and the suspensory guys broken away.

Figure 8, is a detail showing an alternative way of forming the spreading-pockets in one piece with the skirt, by peculiarly shaping the edges of the skirt-sectors; a portion of said sectors only, shown.

Figure 9, shows the aforesaid sectors overlapped and joined together.

In carrying my invention into practice I proceed as follows, viz:

To an ordinary parachute, embodying a skirt, or cover, with the usual suspensory-cords or guys, aviator-harness, and pilot-chute, I affix a series of spreading-pockets or flaps, of the same material as the skirt preferably, so constructed and attached, that, on the downward movement of the parachute, said flaps or pockets catch the air, transfer the same thereunder, through apertures or cuts under said flaps communicating with the interior of the skirt, and thereby partially, automatically and positively, spread the parachute at once.

In launching the parachute the ordinary way, i. e. when the same is carried in a case or pack linked to the aviator's back, the pilot-chute first pulls out the skirt, or cover, to its full length, and next, the guys attached to the aviator harness.

When the aviator first takes the air, said parachute-skirt tends to keep in a closed attitude, by reason of the pull of the pilot-chute on the top end, and aviator on the bottom thereof; said pull not letting it open freely.

Ofttimes, a fall of several hundred feet is obtained before the skirt separates enough to let in the air to spread the same. In the meantime, at low altitude, the aviator may reach the ground before it opens and be injured.

By the use of my automatically-acting spreading-devices, such delay is avoided.

The construction thereof is as follows, viz:

Above each point where a supporting guy is attached to the bottom of a parachute skirt 1, or optionally at other distance apart, I cut an opening 2, in a skirt 1, said opening running parallel with the bottom edge thereof, and from each end of said opening I ex-

tend a cut 2' at right angles thereto and to one side thereof, leaving a flap 2'' below said cut, see Figure 1; said cuts ending at 3, a short distance above the bottom of skirt 1.

These apertures are for passage of the filling air-current, into the interior of the skirt.

I next form, of the skirt material for each cut 2, a cover or pocket-flap 5, of sufficient width to extend beyond each end of cut 2 and fasten to the skirt, and of such length as to extend from above said cut, to the bottom of the skirt.

Said flaps I make somewhat narrower at the top, than at the bottom, see Figure 2, so that, when the same are fastened on the outside of the skirt, the bottoms thereof will have a flare, and stand away from the skirt and form a pocket or air-scoop to catch the air and move the flap outwardly.

The bottom edge of each flap, is rounded to allow for said flare, and is provided with notches 6, to allow of sufficient material to lap over a bent or offset wire distending member 7, which is sewed therein, to give said flap-bottom an approximately semi-circular shape.

Members 7 may be made from pieces of light spring-wire, preferably, and have end rings 8, formed thereon, for attachment to the skirt, and an offset loop 8', for attachment of a positioning cord 8'', see Figures 3-6. Said distending-members function more perfectly when made of flexible material, and flexibly attaching to the skirt, allows of more compactly folding up, and, attaching the guys to the middle thereof, insures proper positioning when spreading.

I attach one of said flaps 5, centrally over each cut 2, and stitch the same to the outside of cover 1, by parallel rows of stitches. This allows the bottom thereof to flare outwardly and form the air-scoop, and the wire distender ensures the proper flare to the lower edge.

I next attach the positioning-cords 8'' to the respective loops 8', and lead said cords downwardly, outside the bottom of skirt 1, and attach the lower ends thereof to its respective guy 11; preferably by sewing the two strongly together to form a smooth union, to avoid liability to entanglement.

The length of said cords is such that they will position the bottoms of flaps 5 favorably or outwardly to engage the air in the downward movement, see Figure 6.

It will be noted that the top of each flap 5 is joined to 1, above the top side of cut 2, and thus form the top of the pocket, so that when air enters under said flap, it will be guided through opening 2, into the interior of the skirt.

To arrest backward leakage through open-

ings 2 when the parachute is fully spread, I provide each of said openings with a check-valve or flap 10, preferably of the skirt material, and stitch the same, to the inside of cover 1, centrally one over each opening 2, by lines of stitches on the sides and bottom only, leaving the top thereof open for the passage inwardly of the filling air-current.

When the parachute is fully spread, the pressure inside pushes the flap 10 outwardly and prevents back leakage.

The top of each flap 2'' is now sewed to the middle of its respective check-flap 10, to keep said flaps integral against displacement, by line of stitches 12, see Figure 5.

The preliminaries to prepare the device to act, are merely to use care in folding the parachute, so that the positioning-cords and pocket are disposed so as not to entangle on launching; the device being entirely automatic in action.

It will be readily understood, by those skilled in the art, that my movable air-scoops might be made from the material of the skirt proper, by simply shaping the edges of the sections, running from the bottom of the skirt to the apex thereof, with sufficient fullness to allow for the flaring portion 5, approximately as shown in Figure 8, which, when sewed together, would appear similar to Figure 9, and function the same, if fitted with my stiffening-wire and positioning-cord or suspensory-guy, as an attached pocket. It will also be noted, that when the parachute is spreading and is still under longitudinal stress, that there are portions, i. e. either spreading-pockets, or sectors or segments of the same, that are automatically and positively positioned at greater distance from the vertical axis of the parachute than the portion of the skirt-base under stress of the supporting-guy; and that said pockets, or segments, by their advantageous position, will more surely and quickly transfer inwardly the air engaged thereby, and thus progressively build up and retain the internal inflation of the skirt, until such time that the skirt will be far enough extended to overcome the aforesaid stress and permit the air to complete filling the same, in the ordinary way.

Said pockets will fill better and likewise more surely preserve the shape of the cover-bottom if the strip below the same, shown in Figures 8-9, be joined together, so as to preserve the normal bottom contour of the skirt, although said pockets might be extended to the edge of the skirt, and said connecting-bands or strips be disposed higher up, or a plurality of said strips, spaced vertically apart, may be used in place of said single strip at bottom.

Having thus described the construction

and operation of my invention, what I claim as new and wish to secure by Letters Patent, is, viz:

1. A parachute spreading-device comprising a plurality of spreading-pockets or air-scoops, attached to the outside of the skirt of a parachute; a complementary number of openings or apertures under said air-scoops through which the air passes from the outside thereof to the inside to primarily spread the same; a distending-member of semi-circular outline for each of said air-scoops; and a positioning-cord or member co-operating to position and hold each of said members in position, after launching.

2. A parachute spreading-device comprising a plurality of spreading-pockets or flaps, attached to the outside of the skirt of a parachute; a complementary number of openings or apertures through which the air passes from the outside thereof to the inside to primarily spread the same; a hinged, offset, distending-member attached to each of said air-scoops; a positioning cord or member co-operating to hold each of said air-scoops against displacement by the air-current; and a check-flap over each aperture affixed to the inside of the skirt and covering the same against outward leakage.

3. A parachute spreading-device comprising an automatically outwardly-moveable air-scoop or pocket-flap attached to the outside of a parachute skirt; a free aperture or opening from the outside of said skirt to the inside thereof under said flap; a check-flap or cover over said aperture on the inside of said skirt, and allowing of the passage of air-current inwardly only; and means to automatically position and hold the bottom of said air-scoop.

4. A parachute spreading-device comprising a plurality of automatically outwardly-moveable air-scoops or pocket-flaps attached to the outside of a parachute skirt; free openings from the outside of said skirt to the inside thereof and located under each of said pockets; a check-valve or flap over each of said openings affixed to the inside of said skirt by lines of stitches at the sides and bottoms only and leaving the tops open for air-passages; and means to automatically position and outwardly hold said air-scoops on launching.

5. A flexible fold of fabric attached to the cover or skirt of a parachute on the outside thereof by lines of stitching so disposed that the bottom of said fold is open, and may be pulled or forced outwardly to engage the air on its downward movement after launching and form an air-scoop or air-guide; a free opening or air-passage through said skirt allowing passage of air therethrough at certain times, and located beneath said air-scoop at the top thereof; a moveable semi-circular stiffening or distending-member so

attached to the bottom of said air-scoop that it may be folded up or extended outwardly; and means to automatically hold the bottom of the air-scoop against displacement by downward movement after the parachute is launched.

6. In combination, a parachute-cover having formed therein circumferentially spaced-apart slots or gores, located immediately above the lower edge of the said cover; a vertical strip of said cover located between and separating the individual slots, and having overlapped and sewed seams connecting the several cover-strips both above and below said slots, and limiting the size of the cover-circumference; a flap or fold of fabric stitched over each of said slots by stitches at the sides and top only, and forming a continuation of said cover or supporting-surface; an offset or curved flexible stiffening-member attached to the bottom of each of said superposed flaps, and having an eye or ring at each end thereof flexibly attached to the adjoining vertical cover-strip, and so as to allow said members to be folded up, or swung outwardly and form air-scoops, at certain times; a series of supporting-guys attached individually to the middle of the individual offset, stiffening-members; a series of suspensory-guys attached, one to each lower side-end of the correlated narrow cover-strips.

7. The combination with a parachute supporting surface, of a plurality of air-scoops attached to the outside of the supporting-surface at spaced-apart intervals, each scoop having, at the lower edge thereof, a flexible, offset, lower edge-shaping member so attached that the scoop may be folded flat in the pack, or extended outwardly at certain times; individual suspensory or positioning guys attached to the lower edges of the several scoops; a plurality of suspensory-guys attached to the supporting-surface between said scoops; and a cut, or aperture, through the supporting-surface, under each of said scoops.

8. In a parachute, a supporting-surface or cover comprising a plurality of individual vertically-joined sections, having formed therein individual vertical slots or apertures located at uniform distances apart and separated by vertical sections of said cover and leaving a joined strip of said cover around the lower end thereof and connecting said vertical strips and each opening extending vertically toward the apex of the parachute; individual flaps or folds of fabric stitched to the cover over the respective slots by lines of stitches at side-edges and top only and having an extra fullness at the bottoms of said folds so that said bottoms may stand outwardly and form pockets or air-scoops when spreading; a curved or offset stiffening and distending-member attached to the

bottoms of the individual folds and having end-rings or eyes flexibly attached to the cover-strip at each side of said fold and allowing said bottom to fold upwardly or stand outwardly; an eye or offset formed in the mid-length of each stiffening-member; a suspensory-guy attached to each of said eyes; a suspensory-guy attached to the bottom of the individual vertical cover-strips at each side-end thereof, the guys attached to the fold-stiffening members being of such additional length as to allow the fold-bottoms to stand outwardly beyond the bottom of the cover proper and form the air-scoops aforesaid when spreading.

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