

Feb. 7, 1933.

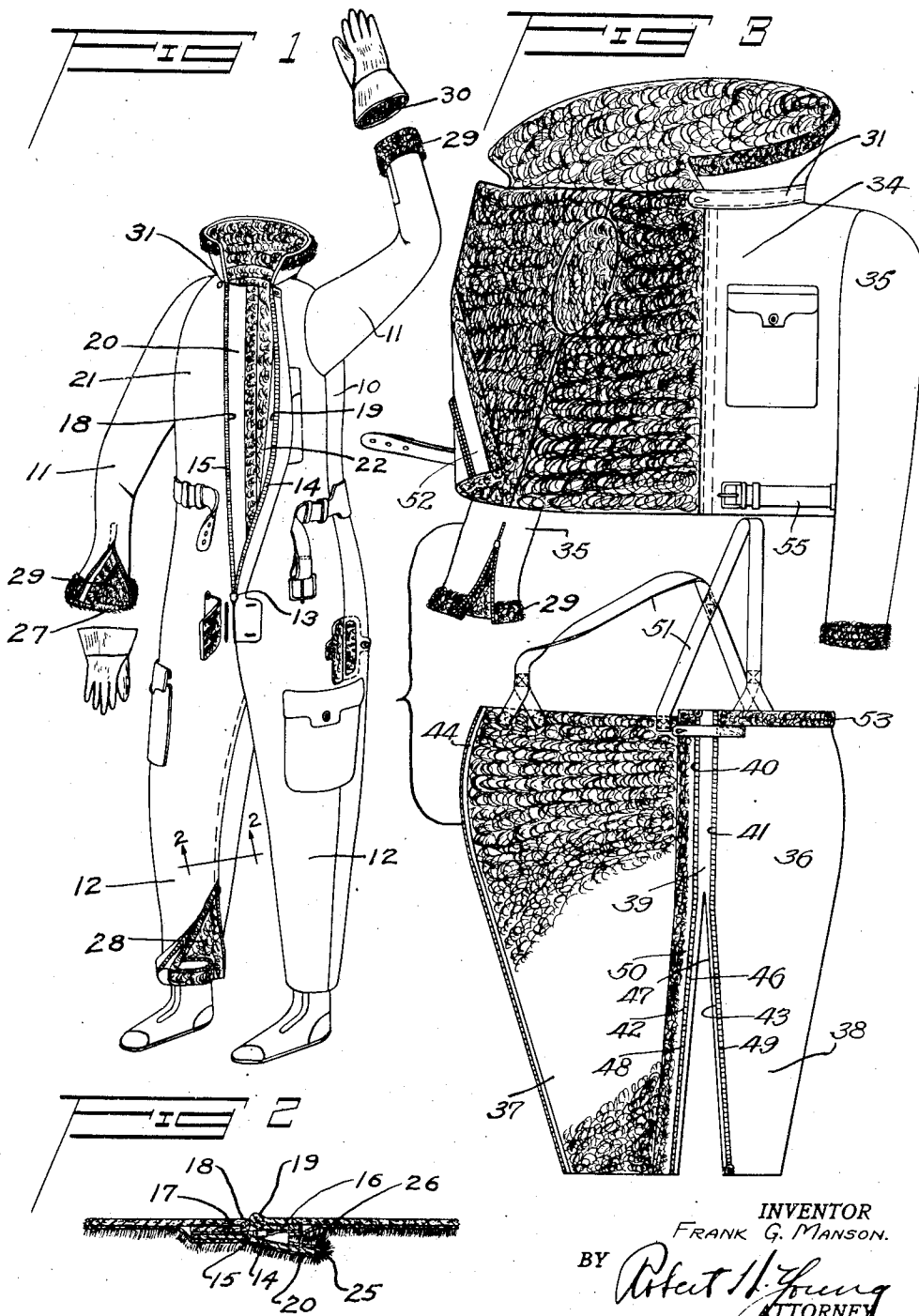
F. G. MANSON

1,896,183

FLYING SUIT

Filed April 11, 1931.

2 Sheets-Sheet 1



Feb. 7, 1933.

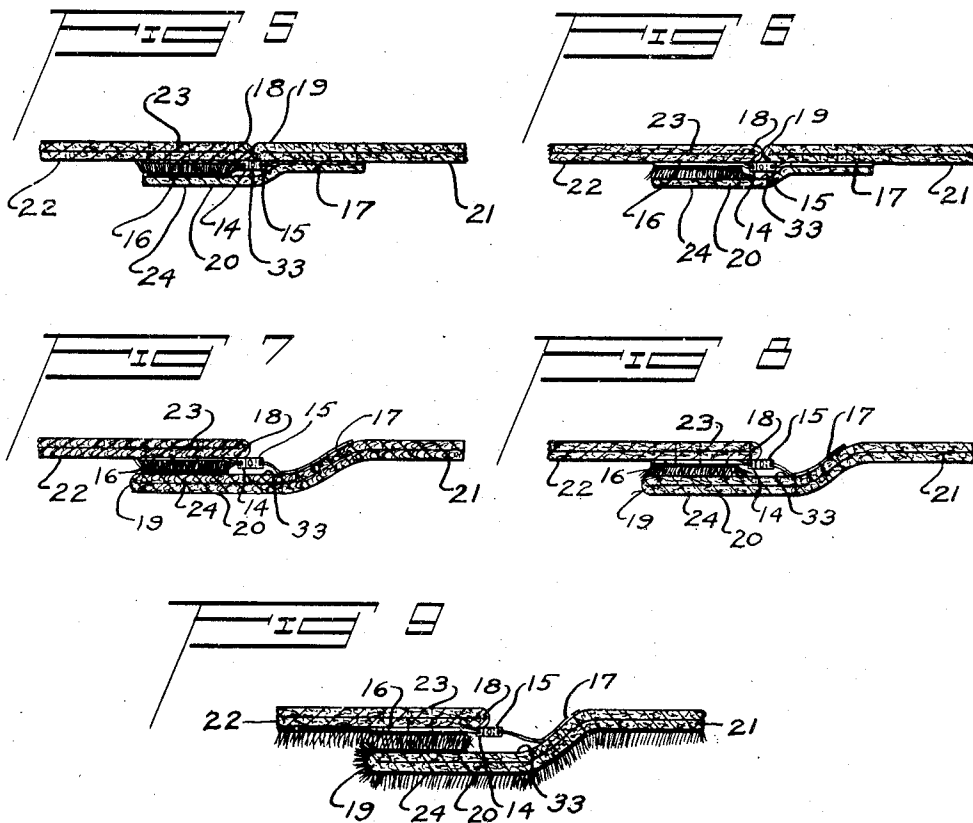
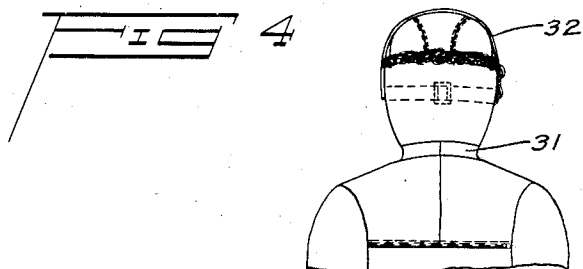
F. G. MANSON

1,896,183

FLYING SUIT

Filed April 11, 1931

2 Sheets-Sheet 2



INVENTOR
FRANK G. MANSON
BY *Robert H. Young*
ATTORNEY

UNITED STATES PATENT OFFICE

FRANK G. MANSON, OF DAYTON, OHIO

FLYING SUIT

Application filed April 11, 1931. Serial No. 529,459.

(GRANTED UNDER THE ACT OF MARCH 3, 1883, AS AMENDED APRIL 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

5 The present invention relates generally to wearing apparel and more particularly to improvements in body garments of the type worn by aviators which are best adapted to retain the warmth of the body and contribute
10 to the convenience and protection of the aviator.

It is an object of the present invention to provide a flying suit which shall incorporate improvements designed to overcome in a most
15 satisfactory manner the diverse conditions with which an aviator comes in contact when flying, inasmuch as the body is generally exposed not only to the penetrating atmospheres but also to the high wind velocity.

20 A further object of the present invention is to provide in a flying suit having separable portions forming openings, continuous interlocking fastening means secured to the meeting edges of said portions to intimately unite
25 said portions, thereby effecting a continuous closure of said openings throughout the entire length thereof and to provide additional means for effectively sealing said openings against the ingress of air.

30 A further object of the present invention is to provide a body garment having arm and leg portions and means secured adjacent the exposed ends of said respective portions adapted to cooperate with separate means
35 secured adjacent the open end of an unattached protecting element, such as the gloves or boots, to effectively seal said aforementioned portions against the ingress of air.

A further object of the present invention
40 is to provide a flying suit of this character and having means for effectively sealing the exposed ends of the arm and leg portions against the admission of air by the provision of strips of pile material, such as cloth or
45 fur adjacent the open ends of said arm and leg portions and adjacent the open ends of the unattached protective elements, said portions, and elements adapted to be prolonged past one another to form broadly overlapping
50 sections with the fibers of said material close-

ly intermeshed throughout the entire length of said section to form a continuous unbroken air seal.

A further object of the present invention is to provide a flying suit of the character
55 described, the collar portion of which when in raised position cooperates with the helmet of the wearer to form an air seal which prevents air penetrating through said collar opening, said collar being provided with
60 means to maintain the same in raised position and under tension against the helmet of the aviator.

With the above and other objects in view, the invention resides in the combination and
65 arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described may be made within the scope of
70 what is claimed without departing from the spirit of the invention.

In the accompanying drawings:

Fig. 1 is a view showing the improved suit with the various parts turned back in the
75 interest of clearness to disclose the cooperative relation between the suit per se and the unattached protective elements.

Fig. 2 is a section taken on the line 2—2
80 of Fig. 1.

Fig. 3 is a modified form of suit, having the air seal construction in accordance with the
85 principles of the invention.

Fig. 4 is a detail view of the collar arrangement of the suit shown in raised position.
85

Figs. 5 to 9 inclusive illustrate in detail modified forms of construction of a section similar to that shown in Fig. 2 and of the various ways in which the sealing feature,
90 in accordance with the principles of the invention, may be applied thereto.

Referring more particularly to the drawings, wherein corresponding parts are designated by like numerals throughout the several views thereof, the garment in the preferred
95 embodiment of my invention herein illustrated comprises generally a body portion 10, arm portions 11 and leg portions 12. The body portion 10 is open down the front, but is adapted to be quickly and conveniently
100

closed by a single movement of the slider 13 of the hookless separable fastening elements 14 and 15, now known commercially, which are carried on strips 16 and 17 respectively and secured to the meeting edges 18 and 19 of the opening of the garment to thus intimately unite the separable portions and effect a continuous closing of the front opening throughout its entire length. A flap 20 attached to the one side 21 of the upper body portion of the garment and secured along the meeting edge 18 of the opening, as shown in Fig. 2, is so arranged as to be prolonged past the opposite edge of the opening as indicated to thus form with the opposite portion 22 broadly overlapping parts 23 and 24 respectively. The garment, as illustrated, may be lined with any well-known pile material, such as fabric, fur, or the like, having inclined and projecting hair-like fibers forming soft surfaces as illustrated. The pile material, which may form a lining for the garment, may be secured to the inner edge of the flap and adapted to extend around the outer edge 25 and to be folded over and secured to the opposite face 26 of the flap. The lining of the opposite portion 22 is adapted to extend beyond the outer edge 25 as shown. As a result, therefore, of this construction, it will be apparent as clearly illustrated in Fig. 2, that the fibers of the pile material of the overlapped parts 23 and 24 will be closely intermeshed to effectively seal the space between such parts against the ingress of air or a penetrating atmosphere.

In a like manner, the leg and arm portions which may be of the open type, having hookless separable fastening elements for closing the said opening, are completely sealed against the ingress of air. The construction of the openings for the arm and leg portions is similar to that described for the opening in the front of the body portion of the garment and for that reason the description of the one will suffice for all.

To further seal the open ends 27 and 28 of the arm and leg portions against the ingress of air, the inner lining 29 of the arm portion 11 as illustrated, is adapted to be overlapped around the outer end of the arm portion, as illustrated in Fig. 1, for a considerable distance. In a like manner the cuffs of the gloves are adapted to extend beyond the outer ends of the arm portion, the lining 30 of which is adapted to be intermeshed with the overlapped part of the arm portion to thus effectively seal the arm portion against the ingress of air.

As will be noted, the reverse order will serve the purpose equally as well, as indicated in Fig. 1 wherein the boots are provided adjacent their outer ends with strips of pile material similar to the lining of the garment and adapted to be overlapped with the inner lin-

ing of the leg portion and thus effectively seal the opening.

As shown in Fig. 4, the neck portion 31 of the garment is provided with a lined collar, which when in raised position as indicated, is adapted to closely hug the helmet of the wearer. To maintain the collar snugly against the head there is provided thereon an adjustable strip 32 which may be of elastic material sewed to each side of the collar as illustrated, which can be raised and passed over the head of the wearer to thereby hold the collar close to the neck and prevent its sagging when turned up.

As shown in Fig. 5, the inner face 33 of the flap only may be provided with pile material, which is adapted to cooperate with the opposed face of the portion 23 to effect a sealing medium. Conversely the fibers of the lined side of the portion 23, as shown in Fig. 6, may be utilized to effect a sealing of the spaces between the aforementioned overlapped parts.

In Figs. 7, 8 and 9, the separable portions of the garment 10 may themselves be overlapped with the pile material arranged in the manner heretofore described and illustrated in connection with Figs. 2, 5 and 6.

My invention, as applied to a two-piece garment as illustrated in Fig. 3, is similar to that described with respect to the one-piece garment shown in Fig. 1. This garment comprises an upper open body portion 34 and a separate lower body portion 36, the lower and upper edge portions of the separate portions being disposed in overlapped relation, the upper portion having sleeves 35 attached thereto and the lower portion being provided with leg portions 37 and 38. The lower body portion is also formed with a depending flap portion 39 adapted for covering the crotch and the center lower front portion of the body of the wearer. The flap portion 39 is of suitable width to give proper fullness at the crotch and is of such length as to extend forward and upward to the upper edge of the lower body portion. The side edges 40 and 41 of the flap portion are integral with the meeting inner edges 42 and 43 of the leg portions 37 and 38 and cooperate respectively with the outer edges 44 of the body portion 36 to form continuous meeting edges that converge towards the crotch in conformity with the inner outline of the leg portion and extend in parallel relationship throughout the remaining portions of their lengths.

The side edges 40 and 41 of the flap portion and the inner edges 42 and 43 of each leg portion respectively have secured thereto a continuous flap 50 of flexible material, such as leather or the like, which is adapted to extend laterally in overlapping relation with the outer edges of the lower body portion 36, as illustrated in Fig. 2. The garment may have an inner layer or lining of any well-

known pipe material, such as fabric, fur or the like, having projecting hairlike fibres. The pile material, which may form a lining for the garment, may be secured to the inner and outer faces of the flap 50. As a result, therefore, of this construction it will be apparent, as clearly illustrated in Fig. 2, that the fibres of the pile material disposed on the overlapped portions will be closely intermeshed to effectively seal the meeting edges of the garment against the admission of air. Shoulder straps 51 may be attached to the upper edge of the lower body portion as illustrated.

Suitable separable fastening elements are provided for readily securing or attaching the lower body portion to the wearer and to this end two sets of continuous, substantially straight meeting edges 46 and 47 extending from the lower end of the leg portions through the upper end of the lower body portion are obtained and the use of hookless separable fasteners 48 and 49 similar to those described for the one-piece garment shown in Fig. 1 is made possible. In view of this arrangement it will be apparent that in joining the meeting edges of the garment the overlapped portions are adapted to bear toward one another with the fibres of the pile material closely intermeshed throughout the entire length of the overlapped portions and thereby provide an air seal for the meeting edges of the garment.

The meeting edges of the upper garment 35 are secured together in the manner described in connection with Fig. 1 and a description of one should suffice for both. As will be noted, the upper body portion has secured adjacent its one side edge a flap 52 corresponding to the flap shown in Fig. 1 and adapted to cooperate with the other side edge of the upper body garment 35 in the manner pointed out heretofore.

An outer layer of pile material 53 is secured along the upper edge of the lower body portion. When in use the upper edge of the lower body portion is adapted to extend beyond the lower edge of the upper body portion to form therewith broadly overlapping portions with the fibres of the pile material 53 closely intermeshed with the fibres of the lining of the upper body portion. To secure a close fit when the garment is in use a belt 55 is provided on the lower edge of the upper body portion and in this manner an intermeshing relation of the fibres of the pile material will be obtained throughout the length of the overlapped portions to obtain an effective air seal.

Broadly the invention consists in the placing of fur or other pile material face to face between the pockets and on the pocket flaps, between the under and front flap, on the outside or inner sides of the body, the inner or outer leg portions of the garment, the inner

or outer arm portions, at the wrists, the inner or outer sides of the gloves or other overlapping detached protecting elements, or all overlapping parts of the coat.

It will, of course, be understood that various changes may be made in the form, details and arrangements of the various parts without departing from the scope of applicant's invention.

What I claim is:

1. In a garment, separable sections having meeting edges, continuous separable fastening means for securing said meeting edges together throughout their entire length, a flap secured to one of said sections adjacent its edge and extending beyond the edge of the other section to form therewith overlapping portions, and pile material interposed between said overlapped portions and so disposed with respect to said meeting edges such that when in use, a continuous air seal for the meeting edges of said separable sections throughout the length of said flaps is obtained.

2. In a garment, separable sections, continuous separable fastening means for securing the edges of said sections together throughout their entire length, a flap coextensive with one of said sections and secured adjacent the edge thereof, said flap extending beyond the edge of the other section to form therewith overlapping portions, and pile material interposed between said overlapped portions and secured to one of said portions adjacent said fastening means such that in joining the meeting edges of said sections a continuous air seal for said separable sections is obtained.

3. In a garment, an outer layer of flexible material having meeting edges, an inner layer of pile material secured adjacent each of the meeting edges and along their entire length, one of said inner layers extending beyond the edge of its outer layer and adapted to overlap the other inner layer with the fibres of the pile material in intermeshed relation and continuous separable fastening means for securing the meeting edges of the outer layers together and for maintaining said intermeshed relation of said pile material to effect an air seal.

4. In a garment, an outer layer of flexible material having meeting edges, continuous separable fastening means for securing said meeting edges together, a flap secured adjacent one of said meeting edges along its entire length and extending beyond said edge in overlapped relationship therewith, an inner layer of pile material secured adjacent the other meeting edge, an inner layer of pile material secured to said flap, said layers of pile material being so disposed with respect to one another as to cause the fibres of said material to be disposed in intermeshed

relation to provide a continuous air seal for the meeting edges of said outer layer.

5 In a bifurcated garment, an open body portion, open leg portions united with said body portion, a flap portion depending from the crotch of said body portion intermediate of said leg portions and adapted to be extended upwardly to constitute a front portion of said garment, said flap portion having 10 its side edges forming continuous, substantially straight edges with the inner edges of each leg portion, said body portion having its side edges forming continuous, substantially straight edges with the outer edges of each leg portion and adapted when in use to be 15 joined with said first-mentioned continuous edges respectively, a flap having pile material secured adjacent the one continuous edge of each joint and adapted to overlap the other edge with the pile material interposed there- 20 between and separable fastening means extending continuously along the outer edge of the body portion and each leg portion and the inner edges of each leg portion and the side edges of said flap portion for securing the edges of the body portion to the edges of the flap portion and the edges of each leg 25 portion to each other and for maintaining said pile material on said flap in continuous contact with said other overlapping portion to thereby effect an air seal.

6. In a bifurcated garment, an open body portion, open leg portions united with said body portion, a flap portion depending from 35 the crotch of said body portion intermediate of said leg portions and adapted to be extended upwardly to constitute a front portion of said garment, said flap portion having its side edges forming continuous, sub- 40 stantially straight edges with the inner edges of each leg portion, said body portion having its side edges forming continuous, substantially straight edges with the outer edges of each leg portion and adapted when in use to be joined with said first-mentioned con- 45 tinuous edges respectively, a flap secured to the one continuous edge of each joint and adapted to extend beyond the other continuous edge to form therewith overlapping portions, pile material interposed between 50 said overlapping portions adjacent said edges and separable fastening means extending continuously along the outer edge of the body portion and each leg portion and the inner edge of each leg portion and the side 55 edges of said flap portion for securing the edges of the body portion to the edges of the flap portion and the edges of each leg portion of each other and for maintaining the pile material in continuous contact with said overlapping portions to thereby effect an air seal.

7. In a bifurcated garment, an open body portion, open leg portions united with said 65 body portion, a flap portion depending from

the crotch of said body portion intermediate of said leg portions and adapted to be extended upwardly to constitute a front portion of said garment, said flap portion having its side edges forming continuous, sub- 70 stantially straight edges with the inner edges of each leg portion, said body portion having its side edges forming continuous, substantially straight edges with the outer edges of each leg portion and adapted when in use to be joined with said first-mentioned 75 continuous edges respectively, an inner strip of flexible material secured adjacent the one continuous edge of each joint and adapted to extend beyond its other continuous edge to form therewith overlapping portions, pile material secured to one of said overlapping 80 portions and separable fastening means extending continuously along the outer edge of the body portion and each leg portion and the inner edges of each leg portion and side edges of said flap portion for securing the edges of the body portion to the edges of the flap portion and the edges of each leg portion to each other and for maintaining said pile material in continuous contact with the other 90 overlapping portion to thereby effect an air seal.

8. In a bifurcated garment, an open body portion, open leg portions united with said 95 body portion, a flap portion depending from the crotch of said body portion intermediate of said leg portions and adapted to be extended upwardly to constitute a front portion of said garment, said flap portion hav- 100 ing its side edges forming continuous, substantially straight edges with the inner edges of each leg portion, said body portion having its side edges forming continuous, sub- 105 stantially straight edges with the outer edges of each leg portion and adapted when in use to be joined with said first-mentioned continuous edges respectively, an inner strip of flexible material secured adjacent the one continuous edge of each joint and adapted to extend beyond its other continuous edge to form therewith overlapping portions, pile material secured to one of said overlapping 110 portions, and separable fastening means extending continuously along the outer edge of the body portion and each leg portion and the inner edges of each leg portion and side edges of said flap portion for securing the edges of the body portion to the edges of the flap portion and the edges of each leg por- 115 tion to each other, said separable fastening means being so disposed with respect to said overlapping portions such that in joining the edges of said garment the overlapping portions are caused to bear against said pile ma- 120 terial continuously throughout the length of said edges to thereby effect an air seal there- 125 for.

9. In a bifurcated garment, an open body portion, open leg portions united with said 130

body portion, a flap portion depending from the crotch of said body portion intermediate of said leg portions and adapted to be extended upwardly to constitute a front portion of said garment, said flap portion having its side edges forming continuous, substantially straight edges with the inner edges of each leg portion, said body portion having its side edges forming continuous, substantially straight edges with the outer edges of each leg portion and adapted when in use to be joined with said first-mentioned continuous edges respectively, an inner strip of flexible material secured adjacent each of said first-mentioned continuous edges and adapted when in use to extend beyond each of said last-mentioned continuous edges to form therewith overlapping portions, pile material secured to each of said strips and so disposed as to be interposed between said overlapping portions, and separable fastening means extending continuously along the outer edge of the body portion and each leg portion and the inner edges of each leg portion and side edges of said flap portion for securing the edges of the body portion to the edges of the flap portion and the edges of each leg portion to each other and for maintaining said pile material in continuous contact with said overlapping portions to thereby effect an air seal.

10. In a bifurcated garment, an open body portion, open leg portions united with said body portion, a flap portion depending from the crotch of said body portion intermediate of said leg portions and adapted to be extended upwardly to constitute a front portion of said garment, said flap portion having its side edges forming continuous, substantially straight edges with the inner edges of each leg portion, said body portion having its side edges forming continuous, substantially straight edges with the outer edges of each leg portion and adapted when in use to be joined with said first-mentioned continuous edges respectively, an inner strip of flexible material secured adjacent each of said first-mentioned continuous edges and adapted when in use to extend beyond each of said last-mentioned continuous edges to form therewith overlapping portions having opposed faces, layers of pile material secured to the opposed faces of each of said overlapping portions, and separable fastening means extending continuously along the outer edge of the body portion and each leg portion and the inner edges of each leg portion and side edges of said flap portion for securing the edges of the body portion to the edges of the flap portion and the edges of each leg portion to each other and for maintaining said pile material in continuous contact with said overlapping portions to thereby effect an air seal.

11. In an outer garment, an upper body portion, a separate lower bifurcated open body portion, each of said portions being

formed with separable sections having meeting edges, continuous separable fastening means for securing the meeting edges of each of said respective portions together, sealing means adjacent the meeting edges of said portions adapted to cooperate with said fastening means in such manner that when joined together a continuous air seal of said meeting edges is obtained, the upper body portion being adapted when in use to form broadly overlapping portions having opposed faces, layers of pile material secured to the opposed faces of said overlapped portions, and a belt secured to the lower end of said upper body portion adapted for maintaining the fibres of the pile material in intermediate relation throughout the entire length of said overlapped portion to effect a continuous air seal therebetween.

12. In a garment of the type set forth in claim 1, said garment being characterized by having a fur-lined collar portion, and resilient means on said collar portion adapted for yieldably maintaining said collar portion snugly against the head of the wearer when in a turned-up position to provide an air seal therefor.

13. In a garment of the type set forth in claim 1, said garment being characterized by including a fur-lined collar portion, and a band of flexible material disposed on said collar portion in such a manner as to be readily positioned over the head of the wearer to yieldably maintain said collar portion snugly against the head of the wearer when in a turned-up position to provide an air seal around said collar portion.

In testimony whereof I affix my signature.
FRANK G. MANSON.

70

75

80

85

90

95

100

105

110

115

120

125

130