

July 3, 1945.

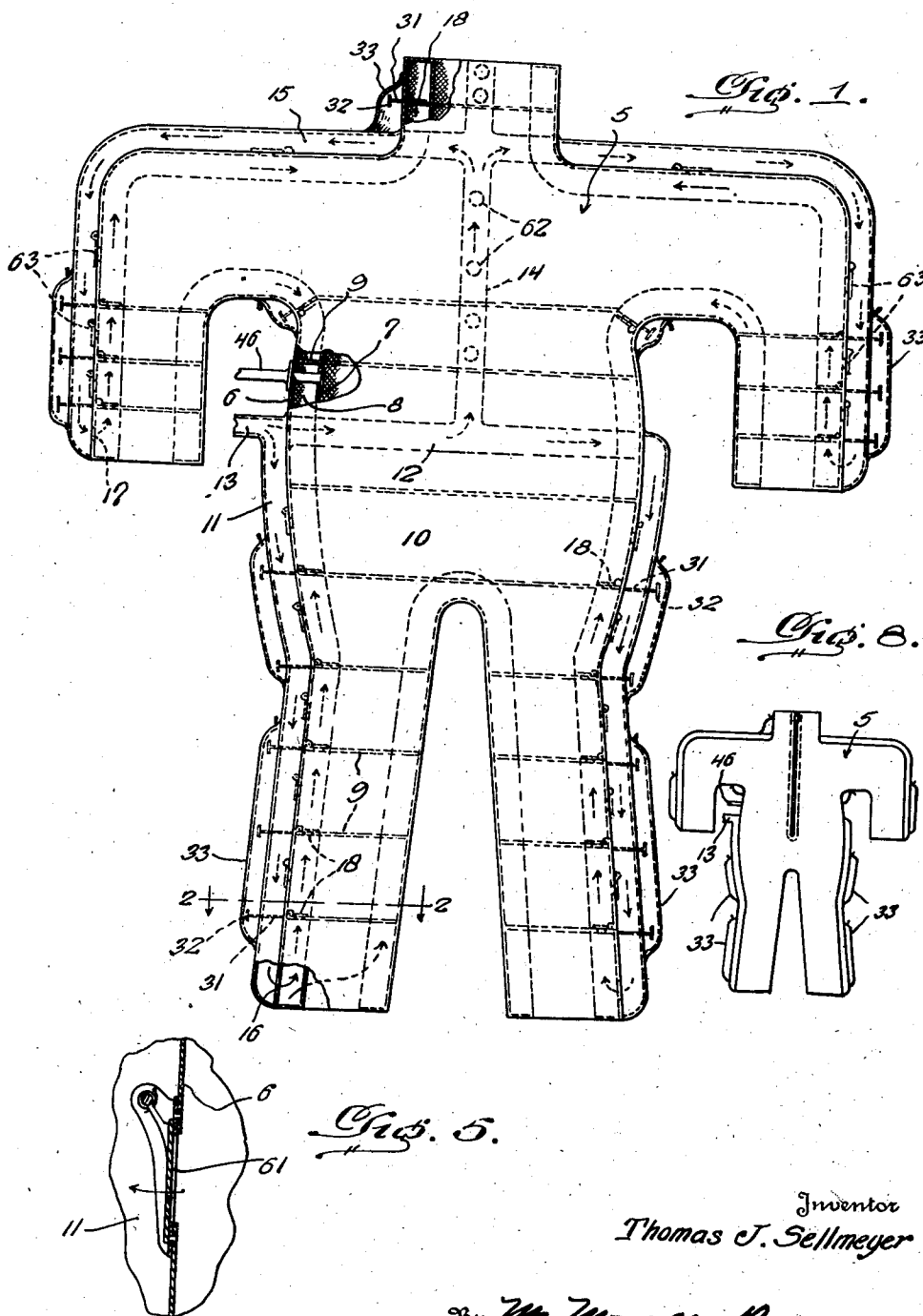
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2,379,497

FLYING SUIT

Filed April 17, 1944

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

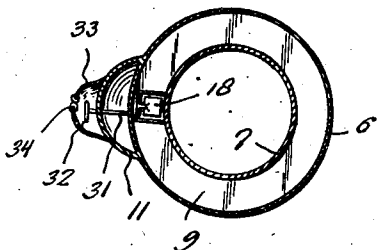


Fig. 3.

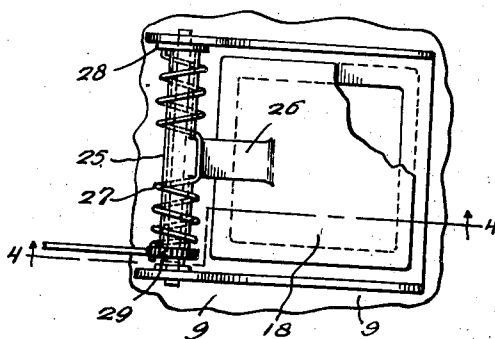


Fig. 6.

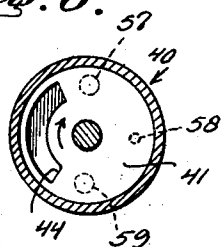


Fig. 4.

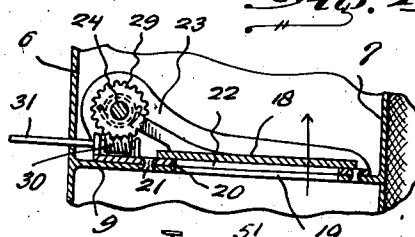
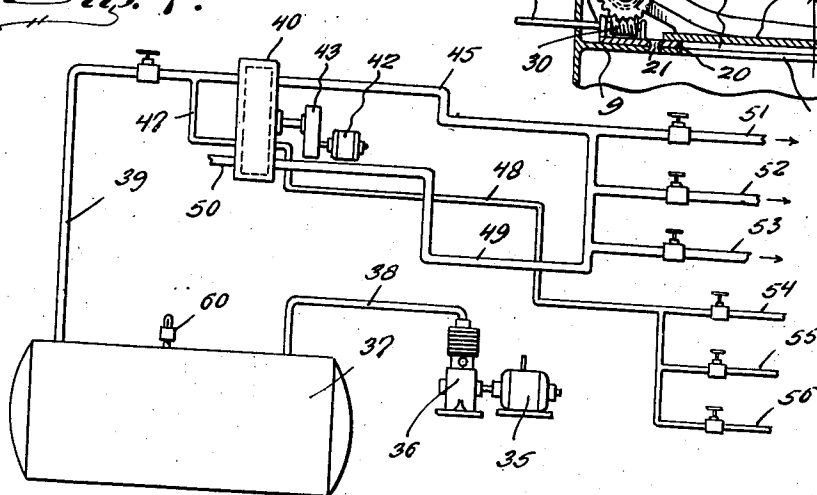


Fig. 7.



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UNITED STATES PATENT OFFICE

2,379,497

FLYING SUIT

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Application April 17, 1944, Serial No. 531,428

4 Claims. (Cl. 128—1)

The present invention relates to new and useful improvements in flying suits designed primarily for use by aviators when flying at extreme altitudes and to help them withstand the pressures due to high-speed acrobatic maneuvers.

An important object of the invention is to provide means for producing a progressive massaging effect upon the body, arms and legs of the aviator whereby to cause an increased circulation of the blood and enabling the aviator to remain at higher altitudes for longer periods and to endure greater pressure.

A further object is to provide a flying suit of this character of simple and practical construction, which is efficient and reliable in performance and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout and in which

Figure 1 is a front elevational view with parts broken away and shown in section,

Figure 2 is a sectional view taken substantially on a line 2—2 of Figure 1,

Figure 3 is an enlarged detail of one of the flap valves,

Figure 4 is a sectional view taken substantially on a line 4—4 of Figure 3,

Figure 5 is a sectional view taken through one of the flap valves,

Figure 6 is a sectional view through the rotary air control valve,

Figure 7 is a diagram of the air supply and exhaust system, and

Figure 8 is a reduced rear elevational view of the flying suit.

Referring now to the drawings in detail wherein for the purpose of illustration I have disclosed a preferred embodiment of the invention, the numeral 5 designates the flying suit generally, adapted to include the body, legs, shoulders and upper arms of a person and composed of outer covering material 6 formed of inelastic semi-flexible material and an inner lining of elastic material 7 spaced from the covering 6 to form an air chamber 8 between the cover 6 and the inner lining 7.

Dividing webs 9 are positioned in the air chamber 8 between the cover 6 and the lining 7 and extending horizontally to separate the body, leg and arm sections into individual circumferen-

tially extending air compartments or chambers 10.

To the outside of the cover material 6 are secured flexible air passages 11 which extend vertically along each side of the suit, the side passages 11 being connected by a transverse passage 12 extending across the back of the suit and an air intake conduit 13 communicates with the passages 11 and 12.

A passage 14 also extends upwardly from the transverse passage 12 and branches at its upper end into lateral passages 15 extending along the shoulders and down along the outer side of the arm portions of the suit.

The lower portion of the side and leg passages 11 communicate with the lowermost air chamber 10 by means of openings 16 and the lower portion of the passages 15 communicate with the air chamber in the arm section by means of openings 17.

The webs 9 separating the air chambers 10 are provided with flap valves 18 shown in detail in Figures 3 and 4 of the drawings to control passage of the air through the openings 19 formed in the web.

Each of the valves includes a rigid plate 20 secured to the web 9 by means of rivets 21 or the like, the plate 20 having openings 22 registering with the openings 19 of the web. Flanges 23 rise from the opposite side edges of the plate 20 and in which shafts 24 are journaled having a sleeve 25 freely rotatable thereon. A lug 26 connects the valve 18 to the sleeve.

Freely mounted on the sleeve 25 is a coil spring 27 having its intermediate portion bearing against the lug 26 and its end portion secured respectively in a flange 28 and a gear 29 secured on the shaft at the opposite end of the sleeve. The tension of the spring 27 is adjusted by means of a worm 30 engaging the gear 29, the worm being secured on a shaft 31 extending outwardly of the suit through the external air passages 11, 14, or 15, as the case may be, the outer end of the shaft 31 having a manipulating handle 32 enclosed in a flexible case 33 secured to the outside of the external air passages, the case 33 having a zipper fastener 34 therein to provide access to the handle 32 for adjusting the valve.

Air admitted into the intake end 13 of the air passages will travel in the direction as shown by the arrows in Figure 1 of the drawings and will pass through the opening 16 and 17 into the lowermost air chambers 10 of the arms and legs and when a predetermined air pressure enters said lowermost air chambers the valves 18 on the ad-

adjacent air chambers will be forced open and air then admitted into said adjacent chambers. The passage of the air will progress upwardly into the next succeeding air chamber as the air pressure is built up in the lower chamber.

Air is similarly admitted into the chambers formed in the body and shoulder portions of the suit by means of valves 18 in the passage 14. Air under pressure is supplied to the air intake 13 of the external passages by means of an air pressure supply system illustrated in Figure 7 of the drawings.

Electric motor 35 drives pump 36 which takes air from the atmosphere, compresses it and delivers it into tank 37, which can be made of any light material as pressures will not be high and are controlled by relief valve 60. Pressure is intended to be from 15 to 20 pounds per sq. in.

The air then travels through pipe 39 to the valve casing 40. This valve casing 40 is fitted with three ports 57, 58 and 59.

The rotating disk valve 41 is fitted with an elongated port 44 and is driven by an electric motor 42 at a predetermined speed through the reduction gear 43. This speed is controlled by a conventional rheostat.

As valve 41 rotates, port 44 passes over first port 57 connecting pipe 39 with conduit 45 allowing air to pass through conduit 45 to manifold 51, 52 and 53 leading to inlets No. 13 in three respective suits if so many suits are desired. Each line 51, 52 and 53 feeds a separate suit.

As valve 41 continues to rotate port 57 is closed and 44 makes contact with 58 connecting branch line 47 with breather line 48 allowing air to pass through manifold 54, 55 and 56 to a pipe 46 in the three respective suits and leading to the interior of the suit to ventilate the same.

As valve 41 continues to rotate both 57 and 58 ports are closed, the suit now being filled with air, and port 59 is contacted connecting line 49 with line 50 allowing the air to escape back through the flap valves in channels 11 and 14, through inlet 13 and manifolds 51, 52 and 53 and then through 49 and 50 to the free atmosphere. The cycle is then repeated.

Air is discharged from the chambers 8 and 10 in the leg and body portions back into the passage 11 by way of flap valves 61 for recirculation when pressure is released in the passage 11 by the rotation of the valve 41 to close the port 57, the flap valves 61 being closed by pressure in the passage 11.

Similar flap valves 62 and 63 are provided for the passages 14 and 15.

Having thus described the invention what I claim is:

1. A flying suit comprising an outer covering of inelastic material, a lining of elastic material, webs spacing the cover material from the lining and forming a plurality of adjoining annular air chambers therein, means for supplying air under pressure to the air chambers, and valves between each adjoining chamber controlling communication between the air chambers to successively admit air thereto.

2. A flying suit comprising an outer covering of inelastic material, a lining of elastic material, webs spacing the cover material from the lining and forming a plurality of air chambers therein, extending circumferentially of the suit, an air passage communicating with one of the chambers, valves in the webs controlling communication between the air chambers and responsive to a predetermined air pressure to successively admit air from said one chamber to the remaining chambers, air exhaust valves between the chambers and the air passage, and means for intermittently supplying and exhausting air to the air passage.

3. A flying suit comprising an outer covering of inelastic material, a lining of elastic material, webs spacing the cover material from the lining and forming a plurality of air chambers therein extending circumferentially of the suit, an air passage communicating with one of the chambers, valves in the webs controlling communication between the air chambers and responsive to a predetermined air pressure to successively admit air from said one chamber to the remaining chamber, air exhaust valves between the chambers and the air passage, spring means for closing each of said valves, means for adjusting the tension of said spring means, and means for intermittently supplying and exhausting air to the air passages.

4. A flying suit comprising an outer covering of inelastic material, a lining of elastic material, webs spacing the cover material from the lining and forming a plurality of air chambers therein extending circumferentially of the suit, an air passage communicating with one of the chambers, valves in the webs controlling communication between the air chambers and responsive to a predetermined air pressure to successively admit air from said one chamber to the remaining chamber, air exhaust valves between the chambers and the air passage, spring means for closing each of said valves, means operable outwardly of the suit for individually adjusting the tension of the spring means for the respective valves, and means for intermittently supplying and exhausting air to the air passages.

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