Jan. 7, 1947. G. D. MALLORY 2,414,051

SUIT

Filed Sept. 20, 1943

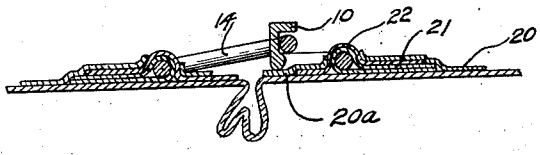

Fig. 3

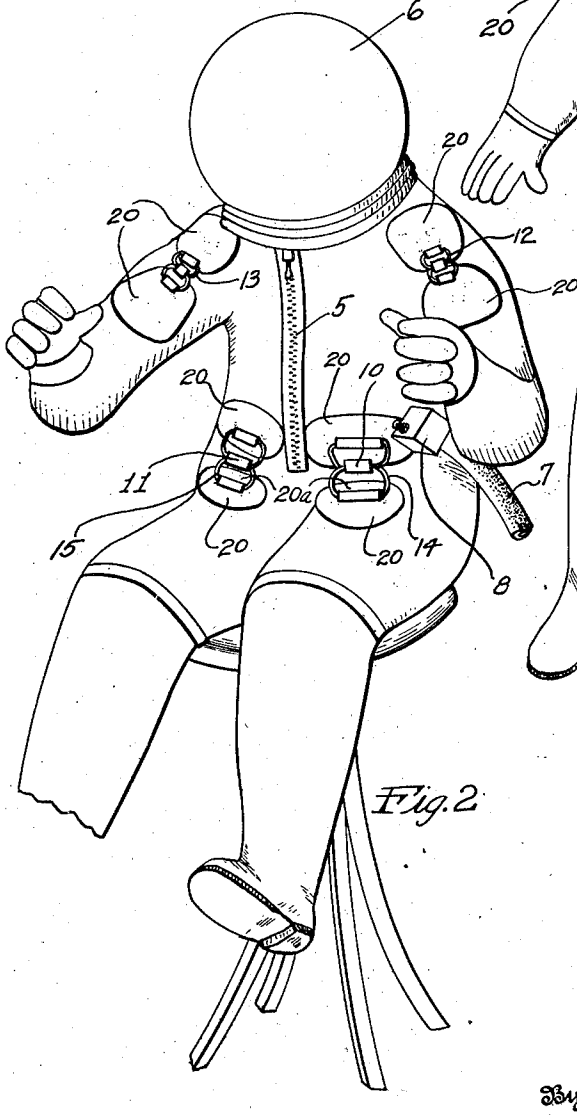

Fig. 2

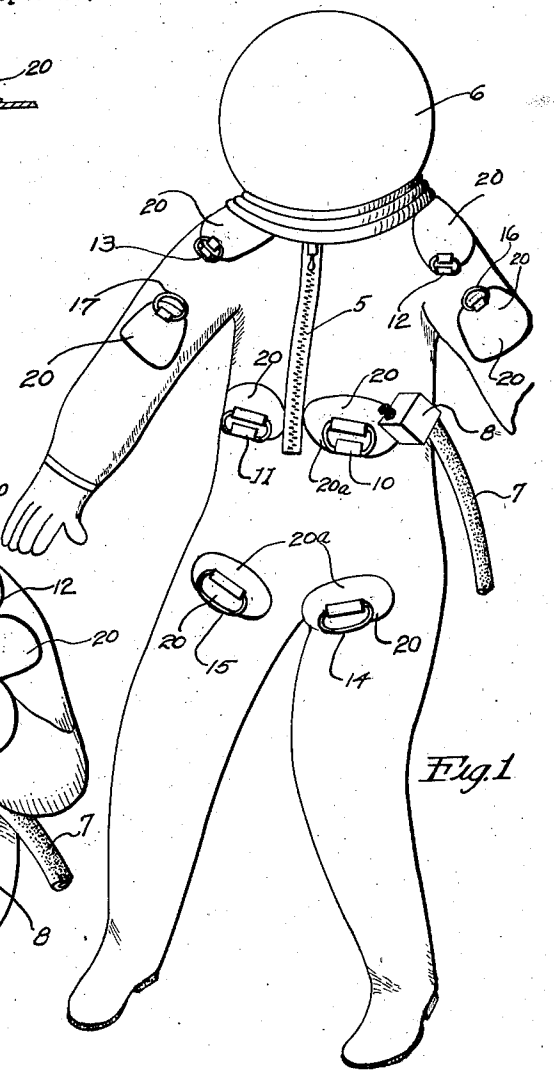

Fig. 1

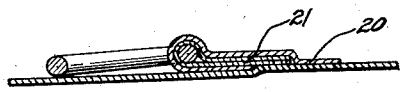

Fig. 4

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SUIT

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4 Claims. (Cl. 2—2.1)

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This invention relates to a pressure suit of improved design and, particularly, such a suit to be used by an aviator at high altitudes.

When such a suit is inflated, it tends to stiffen. The improvement of this invention lies in means at the joint for taking up slack in the suit when the joints are bent. For example, when an aviator is in the seated position, there is considerable slack in the belly of the suit. By the use of rings or other suitable means as described below, the slack can be taken up when the aviator is in the seated position to relieve the strain which he would otherwise be forced to endure. When the rings are unhooked, the slack released is just sufficient to permit him to stand in the erect position under no strain. It is, therefore, possible to operate in either position while not under strain, whereas without some such means it would probably be best to effect some sort of compromise so as to lessen the strain in the seated position and lessen the strain in the erect position, but without eliminating the strain in either position.

The invention will be further described in connection with the drawing in which Fig. 1 shows the suit in an erect position, Fig. 2 shows the suit in the seated position, and Figs. 3 and 4 are cross-sectional views showing different ways of fastening the rings to the hooks.

The suit may be of any desired design. The one illustrated in the drawing is equipped with a zipper closure 5 and transparent dome 6, which encloses the head of the wearer. The suit is inflated through the feed line 7, which is equipped with a control box 8 of any usual type.

Each of the shoulders in the suit illustrated is equipped with a ring and hook, and there is a ring and hook for each leg. This permits the aviator to relieve the strain on any of these joints individually when the joint is to be held in the bent position over a prolonged period. For instance, when the aviator is at the controls of a plane, he will want to take up the slack across the belly of the suit so as to bring the suit into the seated position, and he will want to throw the arms of the suit forward without placing them under any strain. With the arrangement shown, any joint may be held in the bent position, regardless of the position of any other joint.

In the drawing the hooks are designated by the numbers 10, 11, 12, and 13. The rings are designated by the numerals 14, 15, 16, and 17. Larger rings and hooks are naturally used at the legs than are required at the arms because the strain is greater.

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When the aviator takes his seat at the controls, he simply engages the rings 14 and 15 in the hooks 10 and 11. This takes up the slack in the belly, and he sits without strain. If he gets tired, he can unhook one leg or the other and stretch a bit, or when he is ready to rise, he will unhook both of the leg rings 14 and 15. He will hook the shoulder rings 16 and 17 and unhook them at his convenience When hooked, they tend to throw the arms forward and relieve the strain which would otherwise be imposed on his arms when at the controls.

The hooks may be of any suitable type. They may be formed from rings similar to the rings which engage the hooks. Both the rings and the hooks are fastened to the suit in any desirable manner. The patches 20 merely spread the load over a large area. In a rubberized suit these patches are treated with uncured rubber and are then vulcanized to the rubber of the suit. The rings may be fastened to the patches 20 in any usual way, as by looping a strip of fabric 21 through the ring and then folding it back on itself, as shown in Fig. 4. The preferred arrangement is shown in Fig. 3, in which the loop in the fabric 21 which holds the ring passes through a slit in the patch so that the ends of the fabric 21 are fastened to the back of the patch; i. e., between the patch and the fabric of the suit. The portion 20a of the patch, which extends below the rings (Figs. 1 and 3) prevents any tendency of the patch to be stripped from the suit if it is pulled in the direction opposite to that in which it is pulled by the hook. The patch may be reinforced by the ply 22 (Fig. 3) which protrudes through the slit in the patch and covers that portion of the ring or hook covered by the looped fabric 21. The various plies of fabric are coated with vulcanized plastic and sewed or cemented to the patch before curing. The patch is then cemented to the suit fabric (which is also coated with vulcanizable plastic), and all the plies then are permanently united by curing.

The hooks and rings may be replaced by clips or other easily disengaged means of any satisfactory design. They may be added at the elbows and wrists and at the knees and at any other place in a pressure suit designed for use for a particular job where the suit is to be bent continuously for a large part of the time that it is to be worn and is not to be bent a large part of the remainder of the time.

What I claim is:

1. An inflatable pressure suit having a plurality of spaced coacting rings, a flexible strip member

extending about a portion of each ring in the form of a loop, a patch attached to the exterior of the suit for securing the strip member thereto, said patch being slit to permit the looped portion of said strip member carrying the ring to extend slightly therethrough, and clip means on one of said rings for detachable engagement with at least one of the remaining rings to bend parts of the suit temporarily to conform the same to changes in posture of the wearer.

2. Readily detachable means for temporarily bending portions of an inflatable pressure suit of rubber and the like to conform the same to a variety of postures of the wearer, said means comprising a pair of spaced rings, a fabric strip passed through each ring to form a loop engaging said ring, a patch secured to the exterior of the suit, said patch being slit to receive the ends of the fabric strip therethrough and to hold the ring tightly thereagainst, and hook means on at least one of said rings for detachable engagement with the other of said rings.

3. Readily detachable means for temporarily retaining the arm and leg portions of an inflatable rubber coverall suit in partially elevated relation to conform to a variety of postures assumed by the wearer, said means comprising a pair of cooperative spaced rings disposed adjacent each shoulder and each thigh, a fabric web member passed through each ring and doubled to form a loop about a portion of said ring, a reinforcement having a slit extending therethrough cemented and vulcanized to the exterior of the suit for receiving the free ends of each web member through the slit and securing them in place, and a hook portion on one of the rings of each pair for detachable engagement with the other of said rings in each pair.

4. An inflatable pressure suit and the like characterized by portions adapted to be bent to enable the same to conform to varying postures of the wearer, said suit having a pair of spaced rings, each of which is fixed to the exterior of the suit, one of said rings being provided with an integrally formed clip portion thereon for detachable engagement with the other of said rings to fold a portion of the suit between the rings and to retain the suit parts in temporarily bent relation when said rings are engaged.

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