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JET VEST

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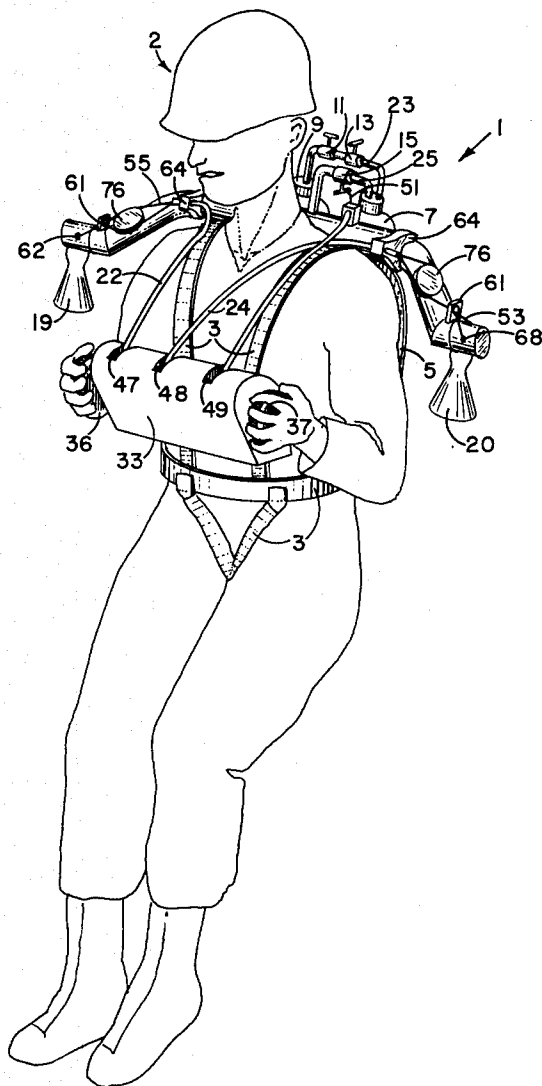


FIG. 1

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JET VEST

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1 Claim. (Cl. 244-4)

(Granted under Title 35, U.S. Code (1952), sec. 266)

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

This invention relates generally to an anti-gravitational device, and more particularly to a portable propulsion system controlled by a user and hereinafter referred to as a "jet vest."

The need for a light weight, compact jet vest that can be easily controlled by the individual foot soldier has long been recognized. The predominant requirements of such a vest have been directed towards the establishment of a suitable design configuration to provide the necessary stability as well as the incorporation of adequate safety features. These requirements have been fulfilled by this invention. The stability requirement has been successfully met by designing a harness which fits around the user's body. A pair of identical jet thrust nozzles are attached to the harness at each side of the user's shoulders in such a way that the lifting force is applied through the center of gravity of the user. This arrangement has resulted in sufficient stability to allow the operator freedom of movement of his upper body which can be utilized, to a limited extent, for directional control. Primarily, however, stability and control of the person is achieved through manual positioning of the two nozzles.

As a result of the increased firepower of modern warfare the present invention is designed to provide the combat soldier with greater mobility on the battlefield. The jet vest is designed to enable combat troops to overcome terrain obstacles such as rivers, broken ground, cliffs, and the like. The invention would have many other applications such as use in transporting individuals from ship to shore, ship to ship, and providing a means for low altitude bailout from low flying aircraft. It might also be used by skin divers or frogmen to propel these men from the surface of the water to a desired position ashore. The military value of the jet vest would also be of particular significance in the future with the anticipation of man's exploration on the moon where the gravitational field is approximately one sixth of that on the earth.

In the past aircraft, land vehicles and ships have been used in the transportation of troops. All these modes of transportation fail to satisfy the needs of the individual soldier on the battlefield. Thus, the jet vest is a special purpose device for unusual missions which cannot be performed by conventional means.

It is, therefore, one object of this invention to provide a device for enabling the combat soldier to scale cliffs, cross rivers, or overcome other terrain obstacles resulting in greater individual mobility.

It is another object of this invention to provide a combat soldier with a mode of transportation which will present a minimum target for enemy fire.

It is another object to provide a light and inexpensive device of the character described that will be fully efficient for its intended purpose.

It is a further object of this invention to develop thrust for the jet vest through the use of a rocket motor which has a high thrust per unit weight, quick, dependable starting, and a compact motor which does not require any large propellers operating at high rotational velocities.

According to the present invention the foregoing and

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other objects are attained by providing an anti-gravitational device in the form of a jet vest which is attached to a user of the device and which has controllable propulsion means attached thereto to provide forward and upward movement to the user.

A more detailed description of the invention follows, in conjunction with a drawing wherein:

FIGURE 1 is a perspective view of the jet vest being used by a soldier.

FIGURE 2 is a sectional view of the attitude and speed control box used with the jet vest.

FIGURE 3 is a partial sectional view of a portion of the propulsion system.

FIGURE 4 is a diagrammatic view of the propulsion system.

FIGURE 5 is a view taken along lines 5-5 of FIGURE 3.

Referring to FIGURE 1, a user 2, such as a combat soldier, is shown wearing a jet vest 1. The jet vest comprises a parachute type harness 3 which straps around the user as shown in the figure. A thin, lightweight, torso-engaging metal plate 5 shaped to the contour of the user's back is attached to the back of harness 3 by any suitable means such as rivets. This plate serves as a support for the propulsion system. The propulsion system includes an air pressure tank 9 connected to a fuel tank 7 containing highly concentrated hydrogen peroxide.

The fuel tank is connected by a fuel line 25 to a central opening in a horizontally positioned, hollow bridge pipe 31 which is secured to plate 5. Bridge pipe 31 is secured to plate 5, in conventional manner, to permit the operator the necessary freedom of movement of his upper body for kinesthetic control of the nozzles, as discussed supra. At the central opening in the bridge pipe the fuel line connects with a T pipe which divides line 25 into separate fuel lines 25a and 25b which each lead to a catalyst chamber 60 rotatably mounted at the end of the bridge pipe. The upper portion of the device includes bridge pipe 31 which serves as a support for a pair of jet nozzles 19, 20 which are threadably attached to the catalyst chambers 60 and also provides protection for fuel lines 25a, 25b.

A control box 33 having handles 35, 36, and 37 is attached by suitable means to the front of the harness. Handle 35 is operatively connected by control wires 53a and 53b to one nozzle 20 to control the angular movement of said nozzle while handle 36 is operatively connected by control wires 55a and 55b to nozzle 19 to control the angular movement of this nozzle. Handle 37 is operatively connected by control wire 51 to a throttle valve 15 to control the amount of thrust desired from the nozzles.

In FIGURE 2, a control box 33 is shown to be of hollow cylindrical form divided by partitions 32 and 39 into three inner sections. A first hollow shaft 45 is rotatably mounted between one end of the control box and partition 32. An opening in the end of box 33 is provided so that shaft 45 may extend therethrough for attachment to handle 36. A pair of closely spaced securing members 40, 42 are attached to shaft 45 and positioned 180° apart so that in the position shown member 42 is at the top and member 40 is at the bottom of shaft 45. Control wires 55a and 55b extend from nozzle 19, through a protective sheath 22 attached to bracket 64, through the control box opening 47 and attach to members 40, 42 of shaft 45. A second shaft 43 extends through the center of handle 36, through hollow shaft 45 and partition 32, and is rotatably secured to partition 39. A handle 35, slightly smaller in diameter than handle 36, is attached to one end of shaft 43 and positioned outwardly adjacent to handle 36. A second pair of closely spaced securing members 44 and 46 are attached to shaft 43 and also positioned 180° apart so that in the position

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shown member 46 is at the top and member 44 is at the bottom of shaft 43. Control wires 53a and 53b extend from nozzle 20, through a protective sheath 24 attached to bracket 64, through the control box opening 48 and attach to members 44, 46 on shaft 43. A third shaft 41 is rotatably mounted between the other end of control box 33 and partition 39. An opening at the other end of box 33 is provided so that shaft 41 may extend there-through for attachment to handle 37. A securing member 52 is centrally attached at the top of shaft 41. Control wire 51 is secured to member 52 so that when handle 37 is initially turned in either direction wire 51 will be tensioned. A guide member 50 is positioned above member 52 and wire 51 is led out of control box 33 through opening 49 and connected to throttle valve 15. By turning handle 37, the user can control the amount of fuel fed to catalyst chambers 60.

FIGURE 3 shows how nozzle 19 is mounted and controlled at the end of pipe 31. Nozzle 19 is threadably attached to catalyst chamber 60 which is a closed cylindrical member. Chamber 60 is rotatably secured to the end of pipe 31 by a screw 65 which engages with an annular slot 66 on pipe 31. As more clearly shown by FIGURE 2, wires 55a and 55b are inclosed by a hollow metal sheath 22 which is attached by a bracket 64 to bridge pipe 31. Wire 55b passes out the end of sheath 22, over a pulley 76 which is rotatably mounted on pipe 31, through a guide ring 61 attached to the top of bridge pipe 31 and is connected to securing member 62 which is disposed on the outside of member 60. Wire 55a passes out the end of sheath 22 over pulley 76 through ring 61 and is connected to securing member 68 which is disposed on the outside of member 60 opposite member 62. By turning handle 36 in one direction, wire 55a will tighten and wire 55b will loosen to effect a rearward movement of nozzle 19, and by turning handle 36 in the other direction wire 55b will tighten and wire 55a will loosen to effect forward movement of nozzle 19. The total angular movement of the nozzle is approximately 15° in either direction. In a similar manner the forward and rearward movement of nozzle 20 is controlled by handle 35 and connecting wires 53a and 53b. Besides providing individual movement to nozzles 19 and 20 for attitude control it is well within the scope of this invention to have the nozzles move simultaneously in the same or in opposite directions. Thus, by means of a locking pin (not shown) handles 35 and 36 could be locked together so that by turning handle 35 in one direction nozzles 19 and 20 would simultaneously move forward and by turning handle 35 in the opposite direction nozzles 19 and 20 would simultaneously move rearward. Through the use of additional control wires it would require no more than mechanical skill to design a means by which nozzles 19 and 20 could move in opposition simultaneously. That is, by turning handle 35 in one direction nozzle 19 would move forward and nozzle 20 simultaneously rearward at the same angular speeds. Conversely, by turning handle 35 in the opposite direction nozzle 19 would move rearward and nozzle 20 simultaneously forward at the same angular speeds.

FIGURE 4 shows a diagrammatic view of the propulsion system used with the jet vest. A thin metal plate

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5 serves as a support for air pressure tank 9 which is connected to fuel tank 7 by a metal conduit 23. The tanks are secured to plate 5 by brackets 4. A shut off valve 11, which is located in conduit 23 adjacent the air pressure tank, is followed by a pressure regulator valve 13 which is preset to feed the desired amount of air pressure to the fuel tank. A second metal conduit or fuel line 25 connects the fuel tank to catalyst chambers 60. A throttle valve 15 is positioned in conduit 25 to control the amount of fuel fed to catalyst chambers 60 positioned at the ends of pipe 31. The catalyst, which decomposes the highly concentrated hydrogen peroxide, may be in the form of an impregnated carrier stone containing permanganate or in the form of activated silver screens. After decomposition, the superheated steam and gaseous oxygen exhaust through nozzles 19 and 20 to provide for upward and forward movement of the user. It should be noted that fuel line 25 enters at the center of bridge pipe 31 in order to provide equal distribution of fuel to lines 25a and 25b on each side of pipe 31 and thus effect equal thrust from nozzles 19 and 20.

FIGURE 5 shows control wires 55a and 55b passing through guide ring 61 which is attached to pipe 31, around chamber 60, and connected to securing members 68 and 62.

While we have illustrated and described the preferred embodiment of our invention, it is to be understood that we do not limit ourselves to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

A propulsion unit for an individual such as a foot soldier comprising a device adapted to be removably attached to a user's body, said device including a torso engaging portion fixedly mounting the weightier components of the unit and thus permitting of the same to be carried directly by the user's body and especially by the hips thereof, said device also including an upper portion having propulsion nozzles provided with means for attachment to a user's shoulder and constituting the lighter of the components of the device, the latter portion of said device secured to said torso engaging portion in relatively fixed relation.

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