(12) UK Patent Application (19) GB (11) 2 236 293 (13) A

(43) Date of A publication 03.04.1991

(21) Application No 9018243.7

(22) Date of filing 20.08.1990

(30) Priority data
(31) 8919856 (32) 02.09.1989 (33) GB

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(51) INT CL^5
B64C 29/00, B63B 1/32, B64C 21/02

(52) UK CL (Edition K)
B7W WPF
B7A ADG A214 A223
F2R RB RW
U1S S1833 S1834 S1839 S1854

(56) Documents cited
GB 2088521 A GB 2084690 A GB 1465412 A
GB 1316837 A GB 1305487 A GB 1146845 A
GB 1027175 A GB 0955845 A GB 0915515 A

(58) Field of search
UK CL (Edition K) **B7A ADG, B7W WPF, F2R RB RW**
INT CL^5 **B63B 1/32 1/34 1/38, B64C 21/00 21/02 21/04 21/06 21/08 29/00 29/04**

(54) **VTOL Aircraft and water craft**

(57) By blowing a blanket of air over an air vehicle's or craft's wings or top surfaces, the static pressure over the wings or top surfaces decreases (Bernouli's theorem). With the pressure over the vehicle's or craft's wings or top surfaces decreased sufficiently the air pressure underneath the vehicle or craft pushes it upwards. Thus vehicles or crafts using the above principle can take off and land vertically. Blowing air over appropriate surfaces of the vehicles or crafts enables the air pressure to propel or push the said vehicles or crafts forward or in any direction. Also applicable to under water craft, blowing water over the upper surfaces.

FIG. 1.

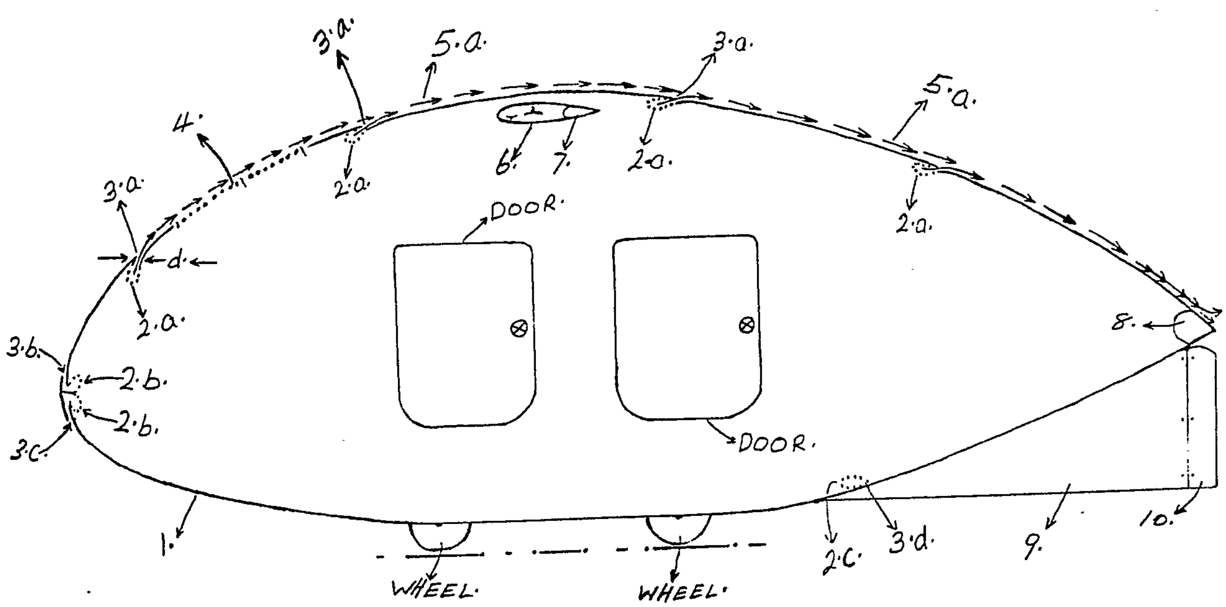

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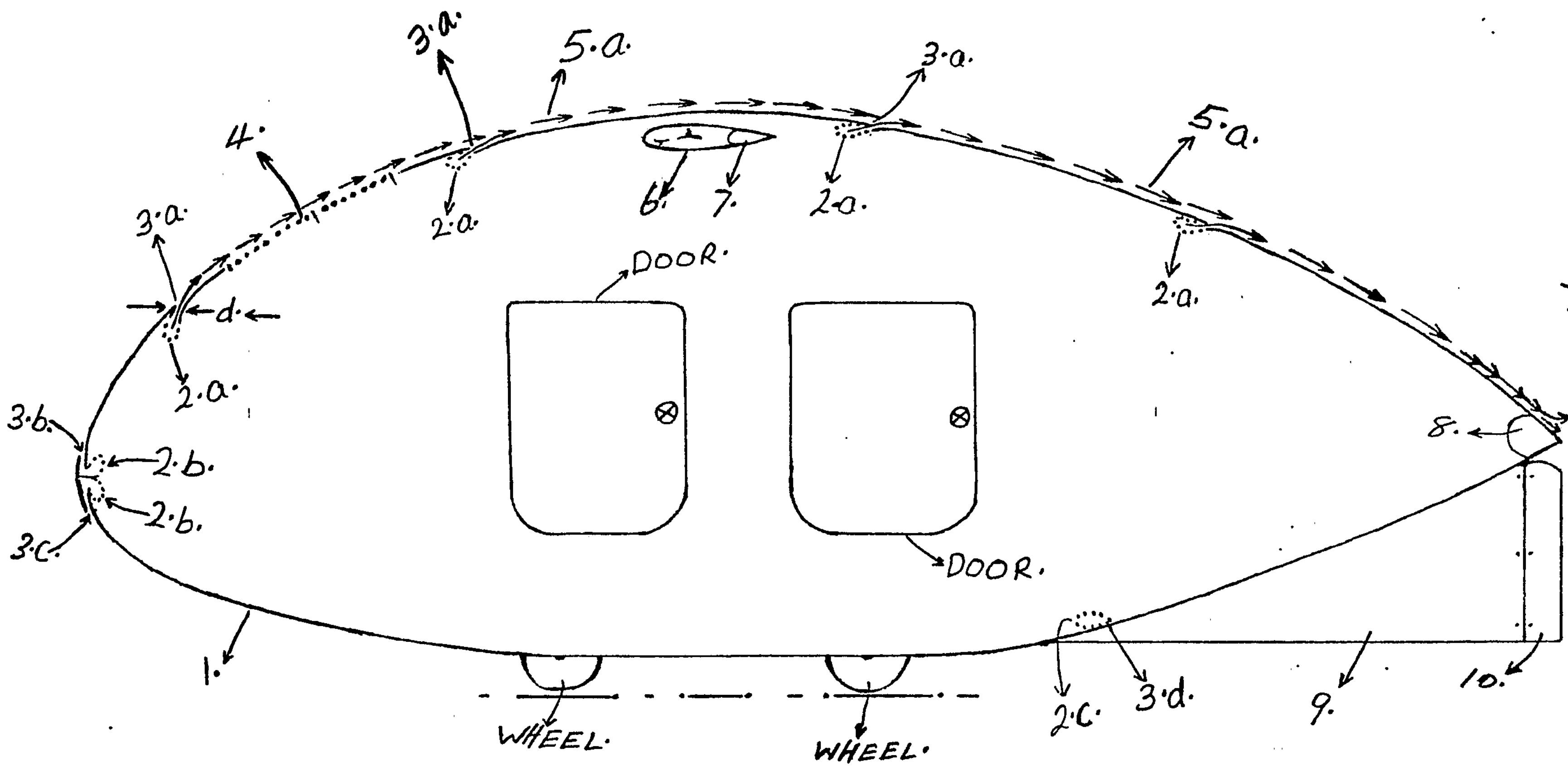
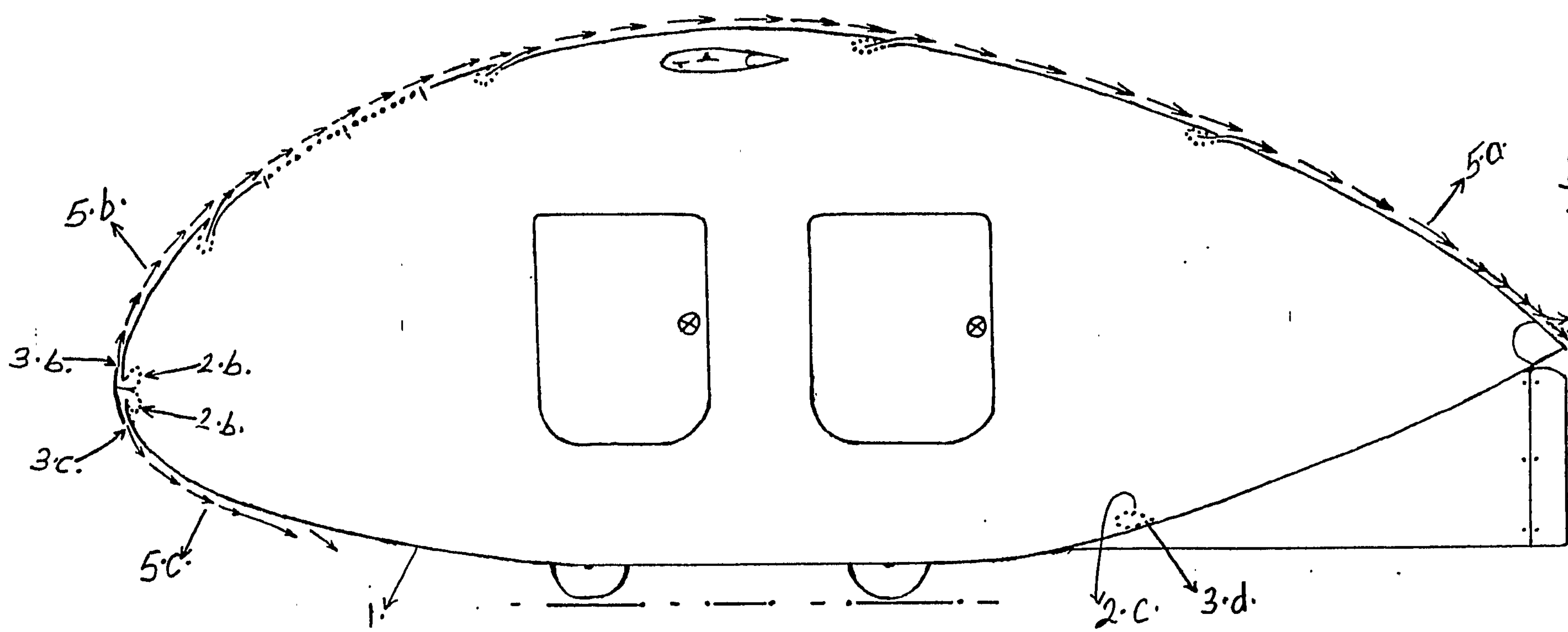
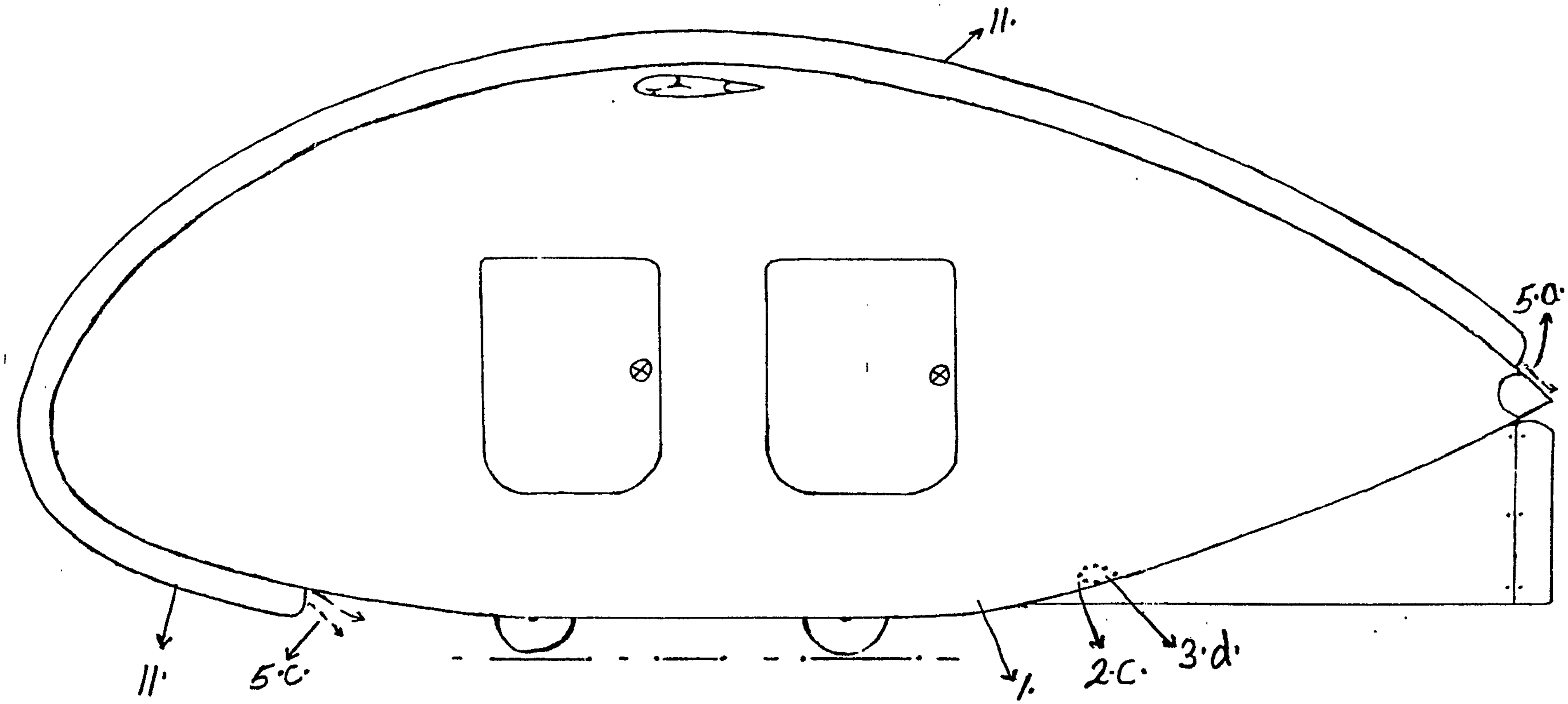
FIG. 1.


3.a.
5.a.
3.a.
5.a.
4.
3.a.
2.a.
6.
7.
2.a.
2.a.
d.
DOOR.
2.a.
3.b.
2.b.
2.b.
3.c.
8.
DOOR.
1.
WHEEL.
WHEEL.
2.c.
3.d.
9.
10.

FIG·2·



FIG·3·



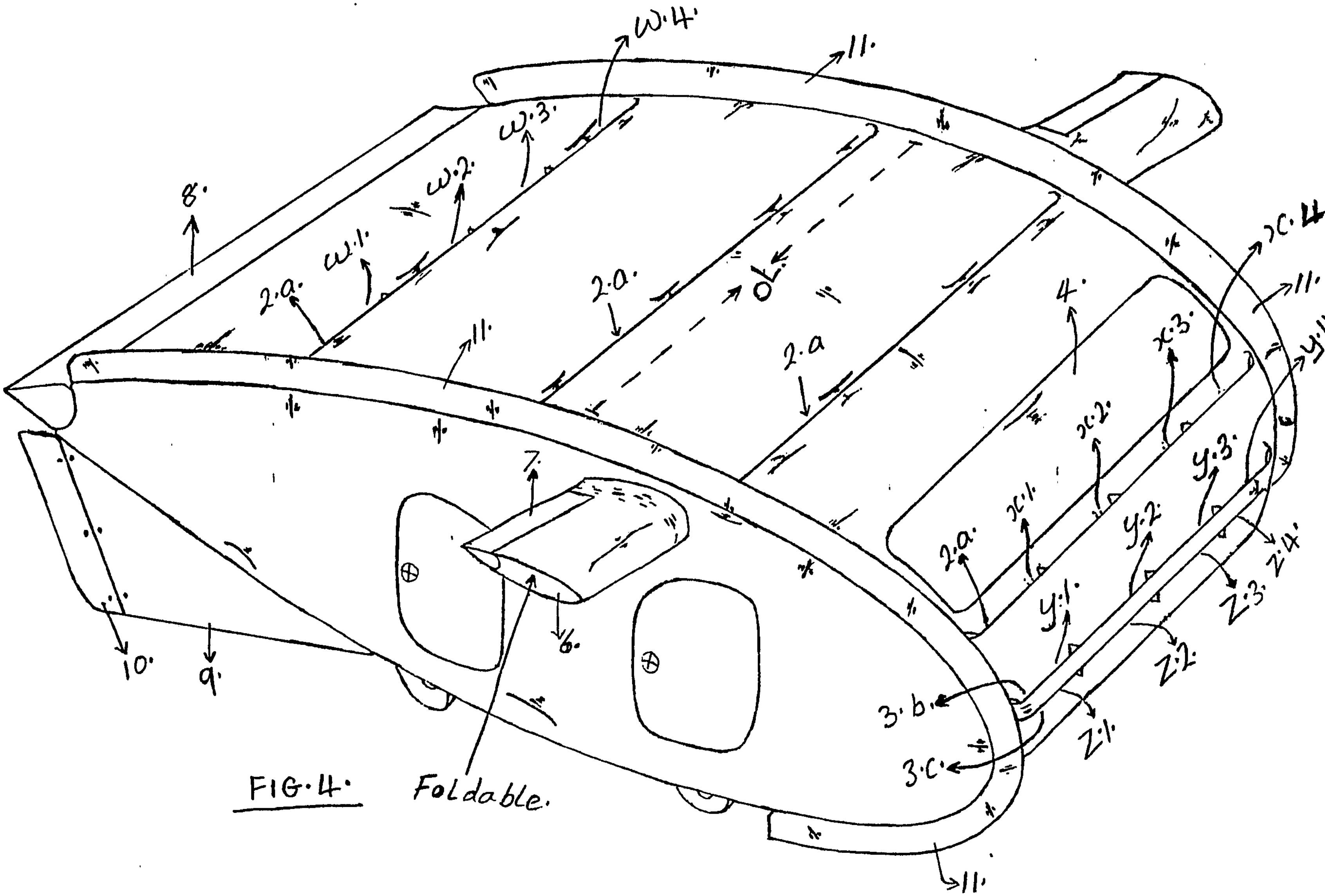
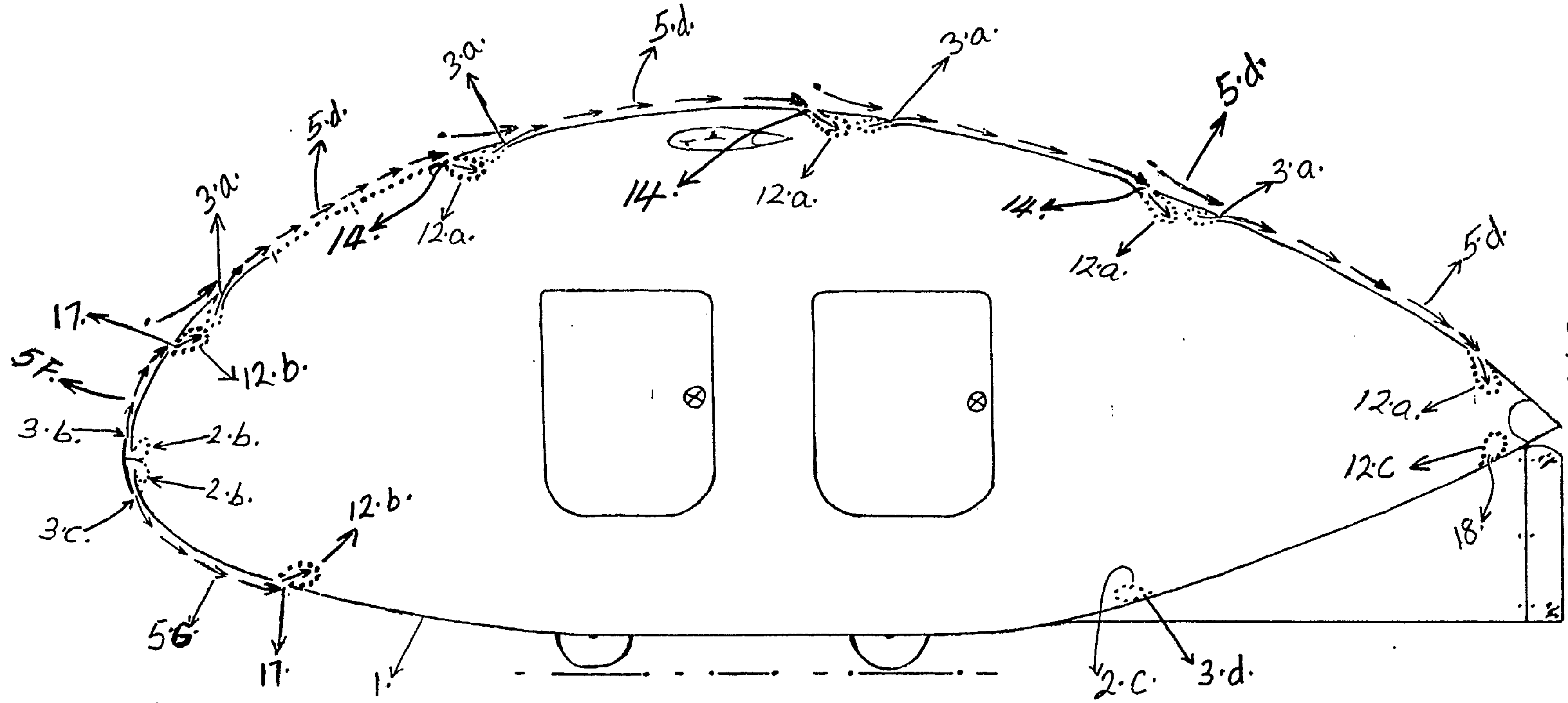

W.4.
11.
8.
W.3.
W.2.
W.1.
2.a.
2.a.
O.
2.a
4.
X.4.
11.
X.3.
Y.4.
11.
X.2.
X.1.
Y.3.
Y.2.
2.a.
Z.4.
Z.3.
Y.1.
Z.2.
7.
6.
10.
9.
3.b.
Z.1.
3.C.
11.
Foldable.

FIG.4.

5/7

FIG. 5.



5·d.
3·a.
3·a.
5·d.
3·a.
5·d.
3·a.
5·d.
14.
12·a.
14.
12·a.
14.
12·a.
12·a.
17.
5F.
12·b.
3·b.
2·b.
2·b.
3·c.
12·b.
5G
17.
1.
2·C.
3·d.
12·C
18.

FIG. 6.

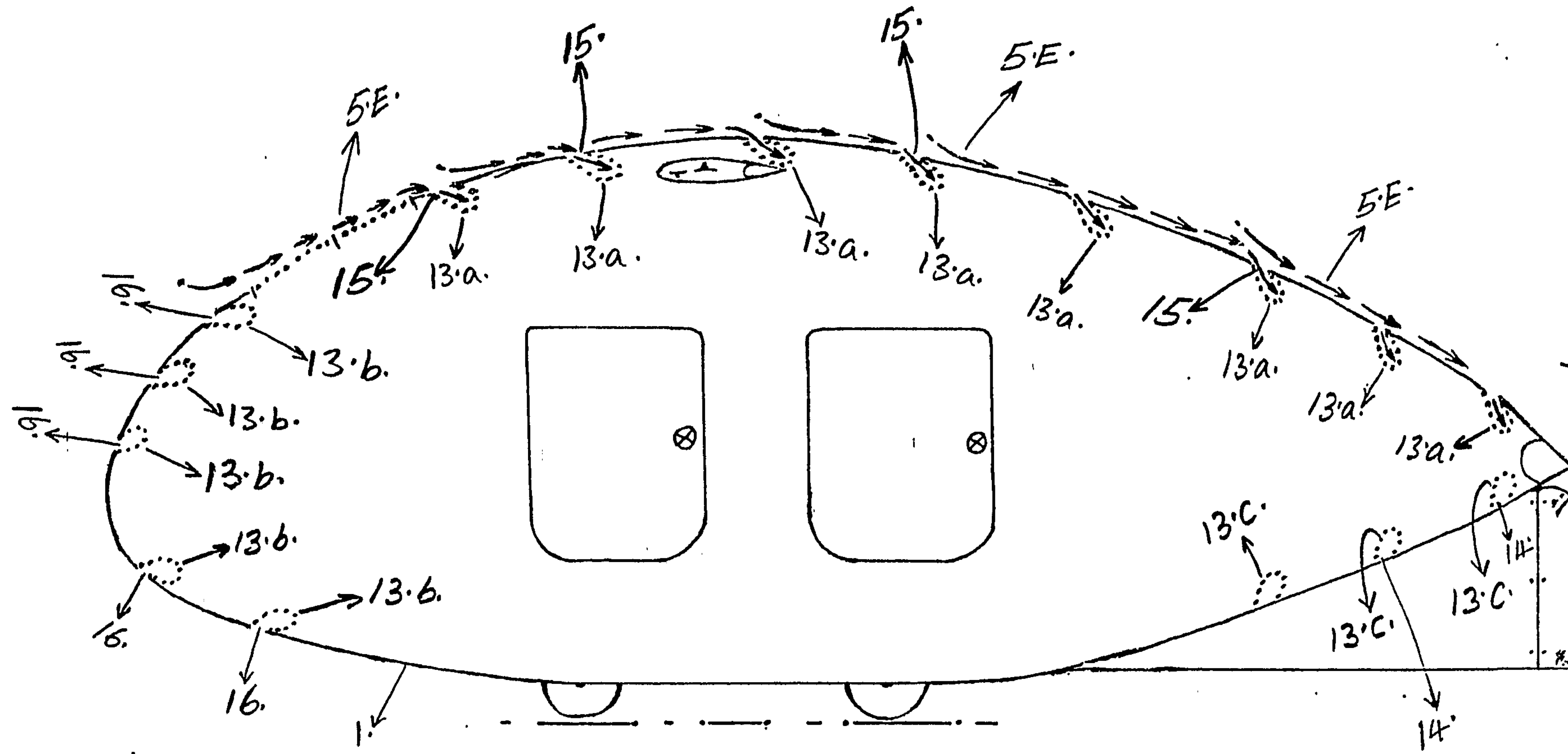
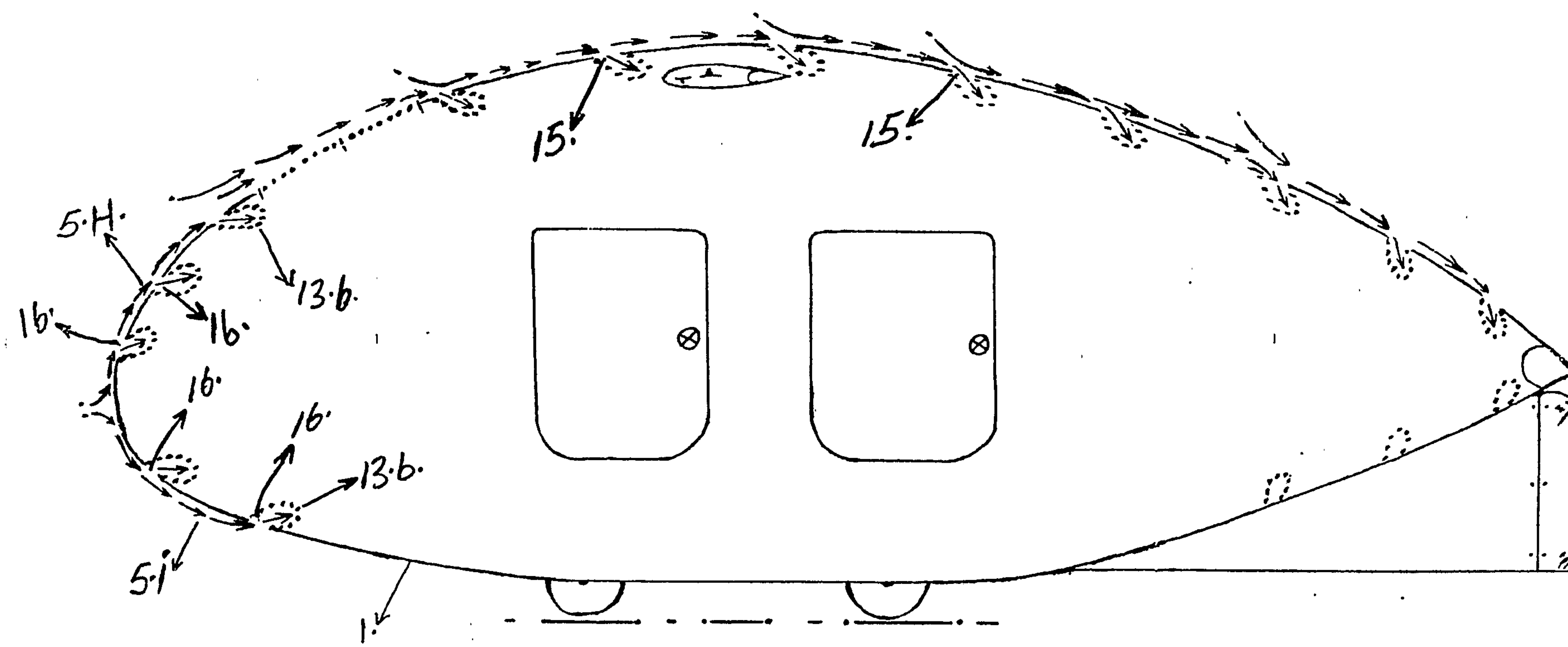


FIG.7.



SPECIFICATION

Obtaining VTOL by blowing, air-jets, over aircraft surfaces

According to Bernouli's theoremn, when air is still, it's, static preasure would be high, relatively speaking, but when the air is caused to flow, for instance, by being blown by a fan or pump, the flowing air's static preasure would be low. It has been possible, useing the above principle to obtain some usefull partial lift on certain aircrafts by simply having some air pumped or blown over the aircraft wings: The airflow causes a reduction in atmospheric static preasure over the wings. With the atmospheric preasure over the wings reduced, the higher atmospheric preasure under the wings push the wings upwardly.

Theorethically speaking, any air vehicle or craft with some air blown over it's top surface or wings, will, if surficient lift is developed through air blowing, be both able to take off and land vertically - it is atmospheric preasure's power and atmospheric preasure's power alone which lifts and keeps the air vehicle or craft up, the air-jets simply cause a preasure de-equaulisation that enables the atmosphere to do work and push the air vehicles or crafts upward. The power that would be consumed in blowing a blanket jet of air over a given wing area so as to produce appropriate lift has by rough calculations have been shown to be favourable.

This invention concerns air vehicles and crafts, and land vehicles and crafts, as well as under water vehicles and crafts, and water surface's vehicles and crafts, and a vehicle with inclusive design ability to operate in all four mediums. Air operational vehicles and crafts operate by blowing jets of air, water operational vehicles and crafts blow water-jets. In FIG.1, is presented a simplistic and generalised sideview drawing of an air vehicle or craft, 1. The air vehicle, 1, has various air pipeing chambers, 2.a, located along it's roof, the air pipeing chambers, 2.a, have constricted openings, 3.a, the openings, 3.a, open up onto the air vehicle's roof: Air flows into all the chambers, 2.a, to rush through the openings, 3.a, and flow as a jet, 5.a, across the vehicle's roof: the resulting preasure reduction across the vehicle's roof can when great enough in magnitude enable the atmospher's preasure to upwardly lift the air vehicle or craft, 1. The particular air vehicle, 1, uses four air pipeing chambers, 2.a, with openings, 3.a, to produce lift. The two air pipeing chambers, 2.b, with openings, 3.b, and 3.c, when operated, enable the air vehicle, 1, to propel forward and accellerate picking up speed. At a given speed the air vehicle's body produces surficient ordinary aero-dynamic lift to surpport and hold the air vehicle, 1, up; the air vehicle's lift producing artificial air flow, 5.a, is then switched off. The air vehicle, 1, has short wings, 6, with control surfaces, 7, attached. Manipulation of the control surfaces, 7, contributes to the air vehicle's stability and manueverability. Stability and manueverability is also contributed to by the rudders, 9, with the rudder control surfaces, 10, and the elevator, 8. The windscreen's position is indicated by the dottedline, 4. To slow down and land at it's destination,, the forward air pipeing chamber, 2.b, blower air-supplies are switched off, air is supplied then to an air pipeing chamber, 2.c, at the air vehicle's rear, the air pipeing chamber, 2.c, has an opening, 3.d, through which an air-jet cn rush out onto the air vehicle's rear surface to produce a reduction in preasure on the said rear surface; The reductionn in preasure rearwards of the air vehicle slows and slows the said vehicle down and a vertical landing can be accomplished.

FIG.2, shows the air vehicle, 1, with air-jets, 5.b, and, 5.c, blown through the openings, 3.b, and 3.c, of the two leading edge air pipeing chambers 2.b. The same vehicle is shown in Fig.3, with endplates, 11, fitted onto it. The flowing air-jets, 5.a, 5.b and 5.c, flow more effeciently with the endplates, 11, fited. Fig.4, presents a naturalistic drawing of the air vehicle, 1. The roof, sides and front end of the said vehicle is visible in the drawing. The trailing edge end, roof air pipeing chamber has four different and seperate air blowing chanels, w.1, w.2, w.3, and w.4. The roof's leading edge end, air pipeing chamber has corespondingly seperate air blowing chanels, x.1, x.2, x.3, and x.4: Variation of the air-jet velocity from the seperate chanels, enable vehicle center of gravity stabilisation at low speeds and during vertical taking offs and landings. The air pipeing chamber on the vehicle's front or leading edge proper has respectively seperate air blowing chanels, y.1, y.2, y.3, and y.4, and z.1, z.2, z.3, z.4; variation of the air-jet velocity from the, y, and, z, chanels enables the vehicle to turn left or rightward. The vehicle's air blowers or pumps may be driven by any means of power. One man or multi person air vehicles may be constructed as may be equivalent category one man or multi person water vehicles. Numerical examples, useing estimated but not unexpexptable figures produce lift magnitudes and power consumption magnitudes favouring the invention:

With atmospheric preasure taken as, Pa, the lifting force, L, developed through blowing air-jets with velocity, V, over a surface of area Al, may be expressed thus:

$L. = \frac{1}{2}\rho V^2 A\rho$ 1

$\rightarrow (PaA\ell)$

Where:

$\rho.$ = Air's density

$\rightarrow (PaA\ell)$ = Limit of force, L.

The power, P, needed to blow air at the given velocity, V, may be expressused thus:

$P. = \frac{1}{2}\rho V^3 Ao$

Where:

(Ao). = Total area of air pipeing chamber openings.
Ao. = nxoLxd:
n. = Number of air pipeing chamber openings in use.
oL. = Lenght of air pipeing chamber opening. (in Fig.4).
d. = Width of air pipeing chamber opening. (in, Fig.1).

Thus:

$P. = \frac{1}{2}lV^3 \times n \times oL \times d.$ 2

Were the air vehicle, 1, to weigh about one ton and have a roof surface area, Al, of about, $8m^2$, (measured from just under the windscreen, 4, to the Trailing edge), the air-jets, 5.a, would, in order for vertical lift to be attainable need to be blown with a velocity V, expressed by manipulating equation, 1 , such that:

$$V. = \sqrt{\frac{L \times 2}{Al \times l}} = \sqrt{\frac{1 \times 10^4 \times 2}{8 \times 1.3}} = 44ms^{-1}$$

The power, P, needed to blow the air-jets, 5.a, at, 44 ms^{-1}, would, from equation, 2 , be:

$P. = \frac{1}{2} l\ (44)^3 \times n \times oL \times d$:

The air vehicle, 1, has four air pipeing chambers for lift production; The same vehicle may be taken to have an abitrary width of, 2m. The air pipeing chamber openings may be taken to have aproximate widths of perhaps 1.5 mm. Consequently and aproximatley,

$P. = \frac{1}{2} \times 1.3 \times (44)^3 \times 4 \times 2 \times 1.5 \times 10^{-3}$
$= 670$ watts.

Water crafts would have the same orders of magnitude of power use in water.

It is possible to increase the velocity of the blown air thus:

For any air blowing or pumping system, the volume of air going into the pump is equal to the volume of air going out of the pump. If the cross section of the pump's inlet is equal to the cross section of the pump's outlet, then the air's velocity entering the pump will be equal to the air's velocity living the pump. If this pump's outlet were to remain the same and if this pump were to expend the same power, then reducing the pump inlet's cross section will result in the air's velocity entering the pump increasing. Before entering the pump inlet, were this faster moving air to be allowed or to be caused to flow over the preasure de-equalising arangements of this invention, then more force would be developed by the system - This is not boundary layer control: In FIG.5, the air pumping system of the vehicle, 1, has had it's top air inlets, 14, arranged strategecally behind the pump's top air outlets 3.a. The arangement enables air which is blown over the roof of the vehicle, 1, to get sucked up into the pump's top inlets, 14, and inlet systems, 12.a. The cross section of the pump's inlets is smaller than the cross section of the pump's outlets, therefore any air being sucked into the pump moves faster. As a result of this fact, the air, 5.d, flowing over the top of the vehicle, 1, moves with a higher overall velocity and the vehicle, 1, produces more lift therefore. The vehicle, 1, has also had front pump inlet systems, 17, and, 12.b, fitted. The front inlets, 17, suck air being blown by the front outlets, 3.b, and, 3.c. The resultant airflows, 5.F, and, 5.G, therefore flows faster over the front of the vehicle, 1, and more thrust can therefore be produced by the vehicle. A rear pump inlet, 18, and inlet system, 12.c, is also fitted to the vehicle's rear. Any air blown by the rear outlet, 3.d, would be sucked up by the rear inlet, 18, and, inlet system, 12.c, and caused to flow faster and produce more breaking force for the vehicle, 1, therefore. In FIG.6, the vehicle's air pump outlets are no longer arranged for blowing air onto the vehicle's surfaces, instead several inlets for the air pump have been strategecally located and arranged along several places on the vehicle's bodywork. The vehicle's roof or top have had several pump inlets, 15, and, inlet systems, 13.a, fitted onto it. Operation of the top inlets causes air, 5.E, to flow along the roof or top surface of the vehicle, 1, as it rapidly enters the top air inlets, 15. The airflow, 5.E, is therefore air which is purely being sucked into the top pump inlets, 15. This method of causing air to flow may be simpler in construction. The vehicle front have had inlets, 16, and, inlet systems, 13.b, fitted while the rear of the vehicle has had inlets, 14, and inlet systems, 13.c, fitted. FIG.7, shows the top and front inlet systems in operation at the same time.

CLAIMS

1 Air vehicles or crafts obtaining vertical lifting and landing through having air or air-jets blown over the wings or top surfaces of said vehicles or crafts.

2 Water vehicles or crafts obtaining sinking and riseing power through having water or water-jets blown over appropriate surface of said vehicles or crafts.

3 The use of pressure-de-equalisation as described in the specification herein for the purpose of providing thrust for all kinds of vehicles or crafts.

This invention is a property of the united nations and all it's associated bodies, consequently:

The products of this invention are not to be used in any operation or operations concerning war, either hypothetical or actual, by any person or persons, army or armies, group or groups.

The products of this invention are not to be used in any revolutions or in the pursuance of any revolutions.

This invention can only be commercially manufactured by registered companies already involved in manufacturing activities under whose sphere of operation or operations and cearings the products of invention might now have to be manufactured. Unless streamlining of production forbids it, any Company wishing to commercially manufacture this invention and sell it would have to establish manufacturing in the countries it wishes to sell in.

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