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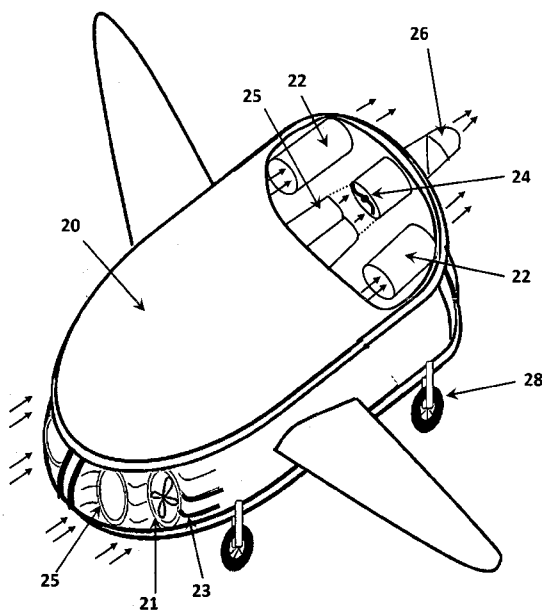
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(54) Title: MULTIPLE TASK AEROCARRIER



(57) Abstract: A Multiple Task AeroCarrier (MTA) (20) with a semi-cuboid shape housing a two front ducted propellers (21) with their swinging mechanism (23) and outlet ducts (22) which are extending toward the rear side, rear ducted propellers (24) are installed inside the second half of two central ducts (25) from the back, these ducts are extending from the front and ending with swivel type nozzles (26). Two inflatable wings (27) are provided with stowing or retarding mechanisms. MTA (20) vertical take-off is initiated by swinging the front ducted propellers into vertical configuration, the rear swivel nozzles are turned into vertical position while the wings still stowed, at a suitable height, the wings are deployed, the front ducted propellers are swung horizontally while the rear swivel nozzles are positioned horizontally. For landing the front ducted propellers and swivel nozzles are swung vertically up, and the wings are stowed.

MULTIPLE TASK AEROCARRIER

Description of the Invention

Technical Field of Invention

This invention relates to manned or unmanned aerial vehicle carrier frame for supporting transportation and other civil services.

Background Art

Road vehicles are the only transportation means which are built over and based on a similar basic design of Chassis + drive train + wheels, they are supporting all multiple task transportations and civil services using: passenger hatchbacks, sporty cars, salon cars, 4WD cars, pickups, buses, ambulances, trucks, desert bikes, patrols, rovers...etc.

In the air, the aerial vehicles are based on extremely different frames and driving mechanisms, with extremely different sizes, shapes...etc. There is no unique basic supporting design for their different bodies' shapes and sizes like in the road vehicles.

One object of this invention is to provide a basic unique compact design for an aerocarrier frame with the supporting technical features to carry out the tasks of road vehicles, but by flying in the lower aerospace, it may have the same size like a normal car or pickup truck to support its easy access (landing) and exit (take-off) from a car parking which is normally suitable for one car, it can carry over its top surface any shape of aerodynamic body enclosing a pilot cockpit, passenger seats, shipment compartment, civil defense equipment, broadcasting room, technician cage, ambulance room, tourists, parcels with drone sets, facade cleaning, rescue service, high rise structures maintenance...etc.

Ducted propellers are selected to drive the motion of this aerocarrier, two swinging (horizontal/vertical) in the front side, and two horizontal at the rear with swivel type nozzles, while the wings are inflatable to support being stowable / retardable at landing, and deployable after take-off.

In the prior art, techniques used to assist direct or indirect aircraft take-offs with pivotable or swinging ducted propellers are disclosed in:

Patent app. publication US2016/0023754 is disclosing a Vertical Take-off Aircraft which uses a mechanism for stowing/adjusting the ducted propellers after

being used in assisting the aircraft take-off via a short crossed distance. Patent app. publication US2016/0311522 is disclosing an aircraft airfoil with a pivotable engine for assisting the aircraft take-off, however none of these is disclosing a frame for a multiple task aerocarrier with ducted propellers which are installed in bottom of it, swingable in the front and of swivel nozzle at the rear, nor it is providing a stowable/deployable wings for easy landing or direct vertical take-off from a narrow car parking specified for one car size, also the prior art which is cited in these two documents is providing ducted propellers in other different locations, even they are swingable or pivotable, in addition to that they are not providing stowable/deployable wings.

Aerial Reconfigurable Embedded System (ARES) is a concept for unmanned VTOL flight module that can transport various payloads, it was started by DARPA as DARPA TX Program, or transformer to be a roadable aircraft, a 2013 DARPA program review found limited interest in the flying car concept, a new model is proposed as a remotely controlled aircraft with no fuselage, a top wing with two side pivotable ducted propellers for take-off and cruising, while carriers will be in-between to carry payloads in the empty space of the traditional fuselage. However, this carrier still so big in size 9.0m X 13.0m, not compact, not providing a stowable/deployable wings, or even a short height, which is less than 1.0 m like in the case of the Multiple Task Aerocarrier (MTA).

Nasa Dryden Flight Research Center, Edwards, Calif has tested successfully inflatable wings, they are deployed in the air, and used while cruising and landing, but there is no stowable/retardable mechanism provided to support vertical take-off or landing from or inside a narrow space.

The prior art is also disclosing many patent applications for carrying out tasks in the lower aerospace: Drone Service Aero-Carrier (WO2014080386), TOP-Wing Aerobotic Glass Cleaner (WO2013076712) or Firefighter Drone Arrangement (WO2014080385)...etc, but all of these compared to the current invention (MTA) are no more than bicycles or motorbikes compared to road vehicles.

As a result the disclosed Multiple Task Aerocarrier (MTA), if used to carry drones with shipments too, in the near future, it can decrease the expected mini drones crowded airtraffic by nearly 80-90 %.

Disclosure of Invention

Brief Description

To provide Multiple Task Aeroarrier (MTA), wherein a semi-cuboid shape with curved sides and chamfer or fillet edges is housing a two front ducted
5 propellers with their swinging mechanism and outlet ducts which are extending toward the rear side, the two front ducted propellers are installed near the front left and right corners of the (MTA) while the rear ducted propellers are installed inside the second half of two central ducts from the back, these ducts are extending from the front and ending with swivel type nozzles.

10 Two inflatable wings provided in two embodiments, in the first each is installed inside a small housing created on the surface of the right/left centers of the (MTA) body right/left sides, these are blown by either onboard nitrogen gas from a gas bottle, or by air which is pumped via an air pump, the inflatable wings are made of two layers outer and inner such that the air is blown in-
15 between them, they are deflated from the air and a mechanism retards them either in accordion pleated shape, or in a second embodiment by pulling them from their ends via strings to be stowed onboard.

The (MTA) can be remotely controlled for carrying payloads onboard or under board, or to support a body frame enclosing a pilot (driver) cockpit while the
20 remaining space is used for passenger seats, civil defense equipment, parcels with drones, ambulance equipment...etc.

The (MTA) vertical take-off is initiated by swinging the front ducted propellers into vertical configuration, the rear swivel nozzles are turned into vertical position while the wings still stowed, then, the ducted propellers will be started,
25 after the (MTA) approaches a suitable height, the wings are deployed, the front ducted propellers are swung horizontally while the rear swivel nozzles are positioned horizontally. The (MTA) landing starts with swinging the front ducted propellers vertically up, turning the rear swivel nozzles vertically downward, discharging the wings from air and retarding/stowing them, then moving down
30 toward a specific marked parking, depending on a viewing camera or cameras.

Brief Description of the Drawings:

- FIG. 1 (A- B): Illustrates a 3-D view for the (MTA) general view with some inner details.
- FIG. 2: Illustrates a 3-D general view for the (MTA) chassis.
- 5 • FIG. 3: illustrates a 3-D view for the (MTA) on land.
- FIG. 4 (A- G): illustrates multiple views demonstrating the (MTA) take-off and landing mechanism.
- FIG. 5: illustrates a schematic view demonstrating the (MTA) cruising mechanism.
- 10 • FIG. 6: illustrates a schematic view demonstrating another embodiment for the (MTA) take-off / landing mechanism.
- FIG. 7 (A- D): illustrates a schematic view for the (MTA) wings stowing/retarding embodiment: stowing onboard and accordion configuration.
- 15 • FIG. 8: illustrates a 3-D view for the (MTA) with onboard cabin body installed for passenger/taxi/tourist mini air-bus type.
- FIG. 9: illustrates a 3-D view for the (MTA) parcels and drones delivery type.
- FIG. 10: illustrates a 3-D view for the (MTA) ambulance type.
- 20 • FIG. 11: illustrates a 3-D view for the (MTA) broadcasting use.
- FIG. 12: illustrates a 3-D view for the (MTA) auto recovery type.
- FIG. 12 (A, B): illustrates a 3-D view for the (MTA) vehicle recovery types.
- FIG. 13: illustrates a 3-D view for the (MTA) provided with onboard cage for technical uses.
- 25 • FIG. 14: illustrates a 3-D view for recovery service.
- FIG. 15: illustrates a 3-D view for carrying big shipments.

Detailed description for carrying out the Invention:

Best Mode for Carrying out the Invention:

In order to make it easy to carry out the invention, a detailed description of the parts of the invention, supported with figures, is provided here, wherein the main parts are arranged sequentially, according to the importance of the part, it is made easy to read, by referring to each feature, with a number included in the parts description text, and in the parts numbering list, the numbering of part features is indicated here, by starting it sequentially from number 20, whenever a part feature appears in a text, it will be directly assigned its required serial number. As example in FIG. 1, the parts' features are arranged sequentially from number 20, 21, 22...

The aero-space used by (MTA) 20 and UAVs is to be called aero-traffic lower space, its height is to be nearly 3,000 meters, this space is to be divided into two: top part for big (MTAs) (Multiple task Aerocarriers) 20, and lower part: for UAVs/drones (unmanned aerial vehicles).

FIG. 1- A Illustrates a 3-D general view for the (MTA) 20 as unmanned aerial vehicle, wherein the shape of the (MTA) 20 is specifically but not limitedly semi-cuboid with curved sides, chamfered edges and fillet corners, from the front right and left sides, it is supporting two front ducted propellers 21 with their swinging mechanism 22 and their duct exits 23 which are extending toward the rear side, the two front swingable ducted propellers 21 are installed near the front left and right corners of the (MTA) 20 while the rear ducted propellers 24 are installed inside the ducts 25 which are extending from their open inlets at the front to their exit swivel nozzles 26. In addition, Inflatable wings 27 are shown deployed and the landing wheels 28 are on landing configuration.

FIG. 1- B Illustrates another embodiment with 3-D view for the (MTA) 20 general view as Unmanned aerial vehicle, wherein instead of using two rear ducted propellers 24 with two swivel nozzles 26, only one is used after converging and uniting the two inlet ducts 25 into one from their other rear half, while their front inlet shape stays the same as in FIG. 1- A.

The (MTA) 20 body 32 from all sides consists of aluminum or fiberglass plates fixed on metallic chassis 33 of bars and beams which are extending along the edges of the (MTA) 20 body 32, while the ducted propellers 21, 24 are in-housed by metallic ring carriers 34, while the inflatable wings 27 housing is supported with a 2D wing-shaped metallic frame 35. Fig. 2 illustrates the chassis 33 with some major parts.

FIG. 3: illustrates a 3-D view for the (MTA) 20 on land, wherein the wings 27 are stowed, the wheels 28 are supporting the (MTA) 20 body 32, the swivel nozzles 26 are not shown here as they are regarded to be on vertical configuration on land, while taking-off and while landing.

FIG. 4 (A- B): illustrates a schematic view for the (MTA) 20 vertical take-off, wherein in Fig. 4-A the front ducted propellers 21 and the swivel nozzles 26 are on horizontal mode, when switching on both front ducted propellers 21 and the swivel nozzles 26 into vertical mode, the ducted propellers are pushed forward to disengage the ducts and swung up 90° so is direction is changed from horizontal to vertically upwards via two conventionally motorized swinging arms 23 located on both front right and left sides of the (MTA) body, the swinging arms are pushed forward hydraulically and rotated 90° (many available mechanisms in the art can be adopted to achieve this 90° movement) while the swivel nozzles 26 are rotated vertically downward in the same method mentioned in the prior arts. Switching on the front 21 and rear 24 ducted propellers allows the front propellers 21 to push the air in a higher speed downward creating a vertical thrust, while the nozzles 26 will guide the high speed air which is exiting the rear propeller duct 25, creating a rear vertical thrust, in total, both front and rear vertical thrust will initiate a four balanced air columns supporting the take-off of the (MTA) 20. It is clear in Fig. 4- B that there is no air passing the ducts of the front ducted propellers 21 during this stage.

FIG. 4 (C – E) illustrates schematic views for the air directions at cruise mode, then switching from cruise mode to landing and finally at either landing or vertical take-off configurations, wherein during cruising the front ducted propellers 21 are on at horizontal configuration, the rear ducted propellers 24

are on too, with the air exiting them kept toward a horizontal direction via the nozzles 26, in total the thrust is in the horizontal cruising direction the same like in FIG. 5. It needs to be noticed here that the thickness of the arrows indicates a high speed air exiting a ducted propeller. In the same Fig. 4- F illustrates arrows representation for the air flow direction and its speed change after exiting the ducted propellers 21, 24 on cruising configuration. Fig. 4- G illustrates arrows representation for the air flow direction and its speed change on either vertical take-off or landing configuration.

FIG. 5: illustrates a schematic view demonstrating the (MTA) 20 cruising mechanism, wherein after completing take-off to a suitable cruising height, the front tubular propellers 21 are swung by the side arms 23 to their horizontal position depending on either hydraulic or motorized conventional mechanism, where they will be pulled back to engage with the horizontal side ducts 36 as male to female, then a high speed air will be pushed outward from their rear side via these two ducts 36 exits 22, a vertical thrust will be created to push the (MTA) forward in addition to the low air pressure zones which are created front of the propellers 21, meanwhile the swivel nozzles 26 are turned to horizontal direction to provide an extra cruising thrust, where the (MTA) 20 will be on full flight mode.

Landing of the (MTA) is nearly 20 similar to the (MTA) take-off but here the wings should be stowed, the (MTA) 20 body 32 should fit to a road vehicle parking size, so the landing starts with wings 27 retarded or stowed and front ducted propellers 21 disengaged from their ducts 36 and rotated from horizontal to vertical position, to share with the rear nozzles 26 in supporting the landing of the (MTA) 20 via the vertical thrust, camera 37 (not shown) spanning the car parking location and the nearby moving vehicles should be installed, wherein here it is recommended to indicate on the parking itself that this is specified for (MTA) 20, so that no car park inside it, a placard 36 hung down may be used to warn other vehicles from getting under the landing (MTA) 20.

FIG. 6 Illustrates another embodiment with a schematic view for the (MTA) 20, wherein instead of using two rear ducted propellers 24, only the front two

ducted propellers 21 are used, while each of their ducts is divided into two, so a total of four sub-ducts 29 is created, such that the high speed air from each sub-duct 29 will exit either normally from opened nozzles (no swivel nozzles 26 are provided). To change the high speed air direction from horizontal into vertical, a flat spring loaded outlets (SLO) 30 are provided and located horizontally from downside after one side of each sub-duct 29 and from the rear side before the exit of the remaining two other sub-duct 29 divisions, each SLO 30 will open like a gate downward by swinging 90° from horizontal into vertical. After each of these SLOs 30 from their rear side, and from inside each sub-duct 29 a rotatable circular plate 31 is installed horizontally to be in parallel with the air flow, while when it is rotated upward and become vertical, it will block the high speed air from exiting horizontally backwards, in such a case, the high speed air will press down on each SLO 30 which will open and direct the high speed air downward creating a thrust from four points to initiate the MTA 20 take off, once the MTA 20 reaches an enough height for cruising, it will rotate the rotatable circular plate 31 into a horizontal position, the air will flow in its normal direction horizontally backwards, while the SLOs 30 will close under the high retard tension of the springs.

Note- 1: the rotatable circular plate 31 which is installed inside ducts and pipes to act like a valve is well-known as a conventional valves in the art, but it should be strongly supported by e.g a hydraulic mechanism to withstand the high speed air when it is blocking its exit.

Note- 2: the SLO 30 can be actuated via many other conventional mechanisms.

The inflatable wings 27 deployment to a horizontal position is easily carried out; either from their on-board stowed position or their storable retarded position, it is no more than blowing air or gas inside them, while the motors 39 which pull them to a storing mode, will be releasing them here slowly until they take the shape like in Fig. 1. The most important part is illustrated in FIG. 7 (A, B) which illustrates a schematic view for the (MTA) 20 wings 27 stowing and retarded. FIG. 7- A- C: illustrates a 3-D view for the (MTA) 20 wings 27 stowing embodiment in steps: two motors 39 are fixed in opposite sides of the (MTA) 20

top side edges, each motor 39 is connected to an opposite wing 27 via a string 40, when evacuating the wings 27 is started, instead of being hung down, the motors 39 will be initiated to pull the wings 27 from their far edges toward the motors 39 where the strings 40 are rolled, pulling the wings 27 in such a manner will stow them in a compact and neat manner onboard, where the width of the (MTA) 20 which was spanned via the wings 27 demolish to zero. It needs to be noted here, that wings 27 can be stowed too over any full-time cabin which is permanently installed onboard in some embodiments like in Fig.8.

FIG. 7- D: illustrates general schematic views for the (MTA) 20 wings 27 retarding into accordion configuration, here the wings 27 are divided into equal areas along their lengths, each area is separated from its neighbor one via a normal strength wing inflatable material, while each area 41 itself is reinforced more than the separation zones 42 which run like belts in-between the reinforced areas 41. This design is made to make it easy to fold the wing into standing (rigid) pleats 43, such that when two parallel strings 40 are run via tubular sealed holes 44 running through each area, then pulling back these strings 40 via a conventional driving mechanism, will pull each reinforced area 41 rigidly as a pleat, while the flexible separation zone 42 in-between these areas 41 which is flexible will tilt the reinforced areas 41 either upwards or downwards to be arranged in accordion pleats 43, with more pulling, the pleats 43 are more pressed toward each other releasing their air, and retarded toward the (MTA) 20 side body 32 into their housings 45, where they are stored in a small space.

FIG. 8: illustrates a 3-D view for the (MTA) 20 with onboard cabin 46 body installed (Manned aerial vehicle), the onboard cabin can be taking a shape of a mini-bus, but to be called mini-airbus (MAB), the body here can be made of Aluminum and can be divided from inside into front cockpit, while the remaining room space can be used for the configurations which are illustrated in Figs (8-12) as two option for the passenger seats positioning (Fig. 8), or carrying pacrcels which is to be received by local drones, or once the MTA approaches a destination its roof opens for inner drones provided with the MTA to unload it and deliver the parcels (Fig. 9) or to be used as an ambulance (Fig. 10) or to be

used for broadcasting for coverage from a height with a better view (Fig. 11) or to be used for vehicle / motor bike recovery service (Fig. 12).

FIG. 13: illustrates a 3-D view for the (MTA) provided with onboard cage 50 for multiple technical services and uses such as: façade cleaning, fire fighting, painting, repair, maintenance of high rise buildings or structures and also MTA to drone parcel delivery. The cage 50 is installed for staff and their equipment safety and security, meanwhile providing easy access for carrying technical jobs from onboard of the MTA.

FIG. 14: illustrates a 3-D view for recovery service.

FIG. 15: illustrates a 3-D view for carrying big shipments.

Finally: a city theoretical areal-tracks 48 (airways) divided in-between (MTAs) and UAVs: as the (MTA) and UAVs will create crowded air traffics without any solution provided in any invention, here the (MTAs) and UAVs are suggested to have identification numbers + registration plate numbers, each type of (MTA) or UAVs should have a flight level of height which it should not pass it up or down randomly, but should have inlet column 49 tracks for vertical take-offs towards their track levels, in the same they should have exit column 49 tracks 48 for landing, they will not stop suddenly inside their tracks 48 then to move vertically downward directly, but there should be sideways tracks 48 were they leave their original highway tracks 48 to lower down their speeds, then to move down through the recognized and organized theoretical track 48, until it is completely engaging to its track column 49 where it moves vertically down.

The same should be applied for the taking-off, U- turns, and turning right or left, theoretical track bridges should be introduced too to prevent crowded drones at the cross-sections.

So, for UAVs, police drones should have their own track heights, the same applies for parcel delivery drones, firefighting drones...etc, and in the same multiple height level tracks should be divided in-between the multiple types of (MTAs).

Industrial applicability:

- 1- Multiple Task Aerocarrier with its ducted propellers, frame plates, chassis beams, control panels, ducts, inflatable wings...etc made from available tools, parts, mechanisms, with applicable modifications.
- 5 2- Multiple uses in civil service unmanned transportation; it can be used by commercial sector, governmental departments, hospitals, traffic control...etc.
- 3- Multiple Task Aerocarrier reshaping and reconstructing the lower aerospace traffic, to be less crowded, more organized, efficient, and
10 beneficial.
- 4- A revolutionary solution replacing all proposed flying cars which needs long distance take-off fields, or big spaces for landing or bulky mechanisms to fold the bulky wings into unorganized shapes.
- 5- The Multiple Task Aerocarrier will open the lower aerospace to be used as
15 a solution for the high crowded road traffic ratios specially in the big cities.
- 6- Mini-MTA can be provided with EDFs (electric ducted fans) to perform jobs like drones.

20

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Parts Drawing Index:

	20	Multiple Task Aerocarrier.	50- Cage.
	21	Front swingable ducted propellers (R/L).	
5	22	Front propeller duct exits (R/L).	
	23	Swinging motorized arms.	
	24	Rear ducted propellers (R/L).	
	25	Rear propeller ducts (R/L).	
	26	Exit swivel nozzles.	
10	27	Inflatable wings (R/L).	
	28	Landing wheels.	
	29	Sub-ducts.	
	30	Flat spring loaded outlets (SLO).	
	31	Rotatable circular plate.	
15	32	MTA body.	
	33	Chassis.	
	34	Metallic ring carriers.	
	35	2D wing-shaped metallic frame.	
	36	Side ducts.	
20	37	Camera.	
	38	Placard.	
	39	Motor.	
	40	String.	
	41	Reinforced Area.	
25	42	Separation zone.	
	43	Pleat.	
	44	Tubular sealed hole.	
	45	Wing housing.	
	46	Onboard Cabin.	
30	47	Cockpit.	
	48	Track.	
	49	Column.	

Patent Application Cited documents:

	Patent Application Publication No.s	Publication date	Inventors:
	US2016/0023754	Jan.28, 2016	Daniel Wiegand
	US2016/0311522	Oct. 27, 2016	Daniel Wiegand
5	WO2014080386	30.May, 2014	ALSHDAIFAT ..etal
	WO2013076712	30.May, 2013	ALSHDAIFAT ..etal
	WO2014080385	30.May, 2014	ALSHDAIFAT ..etal

Claims

- 1- A multiple task aerocarrier (MTA) (20) comprising:
 - a front swingable ducted propellers (21);
 - a front propeller duct exits (22);
 - a push-swing arms (23);
 - a rear ducted propellers (24);
 - a rear propeller ducts (25);
 - an exit swivel nozzles (26);
 - inflatable wings (27);
 - a landing wheels (28);
 - a sub-ducts (29);
 - a spring loaded outlets (SLO);
 - a rotatable circular plate (31);
 - a MTA body (32);
 - a chassis (33);
 - a metallic ring carriers (34);
 - a 2D wing-shaped metallic frame (35);
 - a side ducts (36);
 - a motor (39);
 - a string (40);
 - a wing reinforced Area (41);
 - a wing separation zone (42);
 - a tubular sealed hole (44);
 - a wing housing (45);
- 2- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the the MTA 20 shape is specifically but not limitedly semi-cuboid with curved sides, chamfered edges and fillet corners, from the front right and left sides.
- 3- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the MTA (20) is supporting two front ducted propellers (21) with their swinging motorized arms (22) and their duct exits (23) which are extending toward the rear side, the two front swingable ducted propellers

(21) are installed near the front left and right corners of the (MTA) (20) while the rear ducted propellers (24) are installed inside the ducts (25) which are extending from their open inlets at the front to their exit swivel nozzles (26).

- 4- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein in a second embodiment the two ducts (25) are combined in the MTA (20) center into one duct with one rear ducted propeller (24) ending with one swivel nozzle (26).
- 5- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein in a third embodiment instead of using two rear ducted propellers (24), only the front two ducted propellers (21) are used, such that each of the side ducts (36) is divided into two, so a total of four sub-ducts (29) is created, such that the high speed air from each sub-duct (29) exits either from a normally opened duct exit at cruise mode.
- 6- The multiple task aerocarrier (MTA) (20) according to claim 5, wherein a flat spring loaded outlets (SLO) (30) are provided and located horizontally from downside after the ducted propeller (21) of each sub-duct (29) and from the rear side before the exit of the remaining two other sub-ducts (29), each SLO (30) opens like a gate downward by swinging 90° from horizontal into vertical, while behind each of these SLOs (30) from their rear side, and from inside of each sub-duct (29) a rotatable circular plate (31) is installed horizontally to be in parallel with the air flow, while when it is rotated upward to become vertical, it will block the high speed air from exiting horizontally backwards, such that, the high speed air presses down on each SLO (30) which opens and directs the high speed air downward creating a thrust from four points to initiate the MTA (20) take off, once the MTA (20) is at enough height for cruising, the rotatable circular plate (31) is rotated into a horizontal position, and the air flows in its normal direction horizontally backwards, while the SLOs (30) are closed under the high retard tension of the springs.
- 7- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the body (32) consists of aluminum or fiberglass plates fixed on metallic

chassis (33) of bars and beams which are extending along the edges of the MTA body (32), while the ducted propellers (21), (24) are in-housed by metallic ring carriers (34), and the inflatable wings (27) housing (45) is supported with a 2D wing-shaped metallic frame (35).

- 8- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the inflatable wings (27) of the MTA (20) are stowed while it is on land, the wheels (28) are supporting the MTA (20), the swivel nozzles (26) are on vertical configuration to be ready for taking-off.
- 9- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the MTA (20) positioning both front ducted propellers (21) vertically up to provide vertical thrust via them and via the swivel nozzles (26) which should be on vertical mode to initiate taking-off.
- 10- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the the ducted propellers (21) are pushed forward to disengage from the tips of the side ducts (36) and swing up 90° via two conventionally motorized swinging arms (23) located on both front right and left sides of the MTA body (32), the swinging arms are pushed forward hydraulically and rotated 90° via a motorized conventional mechanisms.
- 11- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the MTA (20) swinging the front ducted propellers (21) by the side arms (23) into horizontal configuration and pulling them back to firmly engage with the side ducts (36), while the swivel nozzles (26) are conventionally rotated to their horizontal configuration, such that all air exits are pointing horizontally backwards, wherein a horizontal thrust will push the MTA (20) forward (cruise mode).
- 12- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the wings (27) are inflated when switching from take-off into cruising, the wings are inflated via nitrogen gas from a gas cylinder or via an air pump, wherein the inflatable wings are of two layers to receive the air in-between them.
- 13- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein

disengaging the front ducted propellers (21) and pushing them forward and swinging them vertically up in addition to pointing the swivel nozzles (26) vertically down, initiates landing of the MTA (20).

- 14-The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the wings (27) are stowed for landing initiation via two motors (39) fixed on top of opposite sides of the (MTA) (20), each motor (39) is connected to an opposite wing (27) via a string (40), when deflating the wings (27) is started, instead of being hung down, the motors (39) pulls the wings (27) from their far edges toward the motors (39) where the strings (40) are rolled.
- 15- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the wings 27 are divided into equal areas along their lengths, each area is separated from its neighbor one via a flexible separation zone (42), while each area (41) itself is reinforced more than the separation zones (42) which run like belts in-between the reinforced areas (41) such that these areas stand rigidly in pleats (43) and once pulled via two parallel strings (40) running via tubular sealed holes (44) running through each area (41), pulling back these strings (40) pulls each reinforced area (41) rigidly as a pleat to be arranged and stored neatly inside the housing (45).
- 16- The multiple task aerocarrier (MTA) (20) according to claim 1, wherein the a cabin (46) with a cockpit (47) to be permanently installed on the MTA (20) for multiple civil service useages.
- 17-The multiple task aerocarrier (MTA) (20) according to claim 1, wherein a cage (50) is installed on the MTA (20) for multiple civil service usages or a hook and carriers installed from downside for carrying payloads.
- 18-A method for controlling the air traffic of MTAs and UAVs comprising:
MTAs and UAVs are recognized via identification numbers + registration plate numbers installed on them and connected with GPS;
each type of MTA or UAV should have an imaginary flight level (height);
MTAs and UAVs road maps to be provided with specific imaginary aerospace tracks, inlets, exits, bridges, U-turns and engaging their flight level and track via a recognized and organized GPS control;

MTAs and UAVs are carrying out their flights according to schedule and prior set controlled flight programs and flight bookings over a specific and formally controlled path with regard to speed, position...etc.

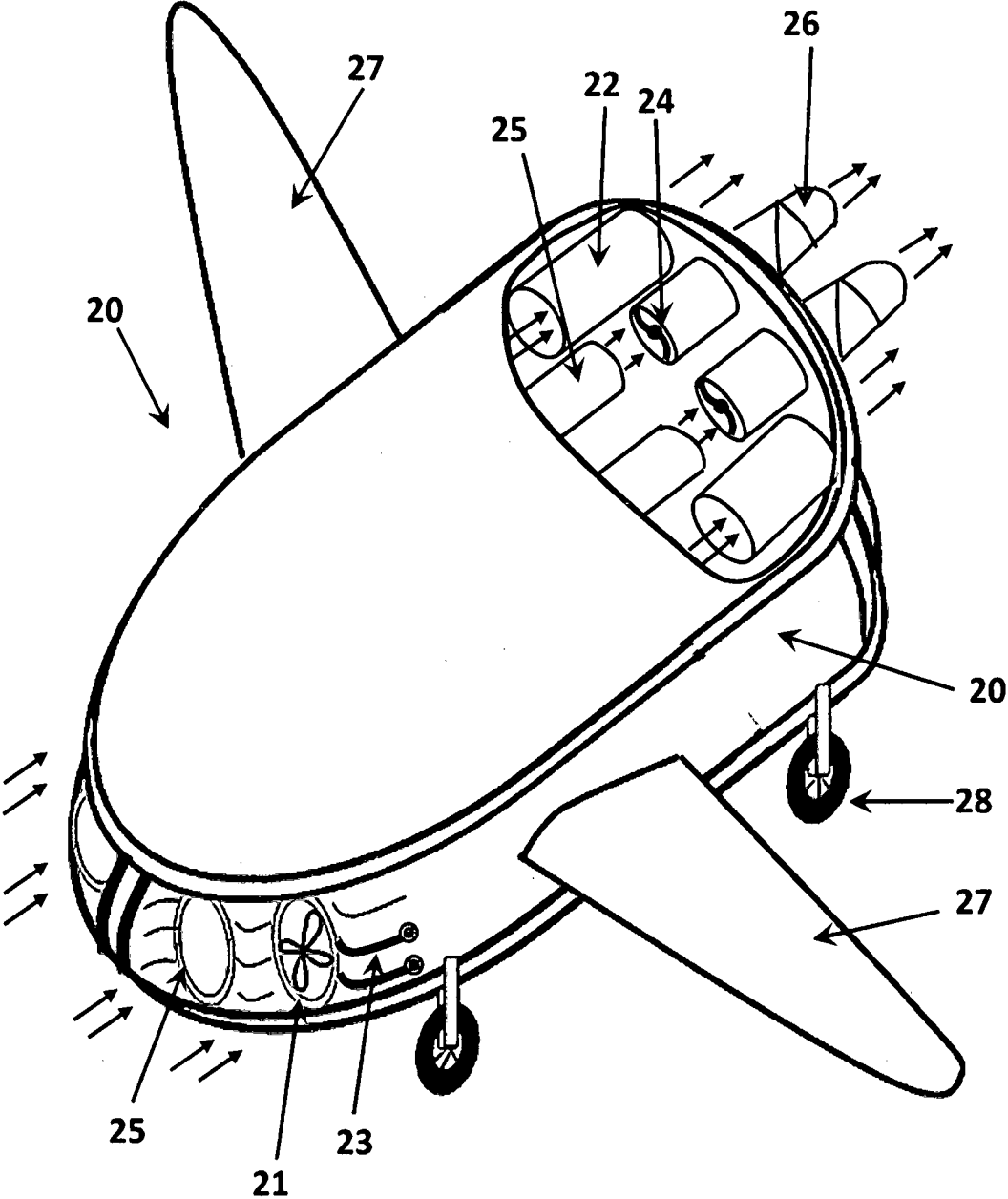


FIG. 1- A

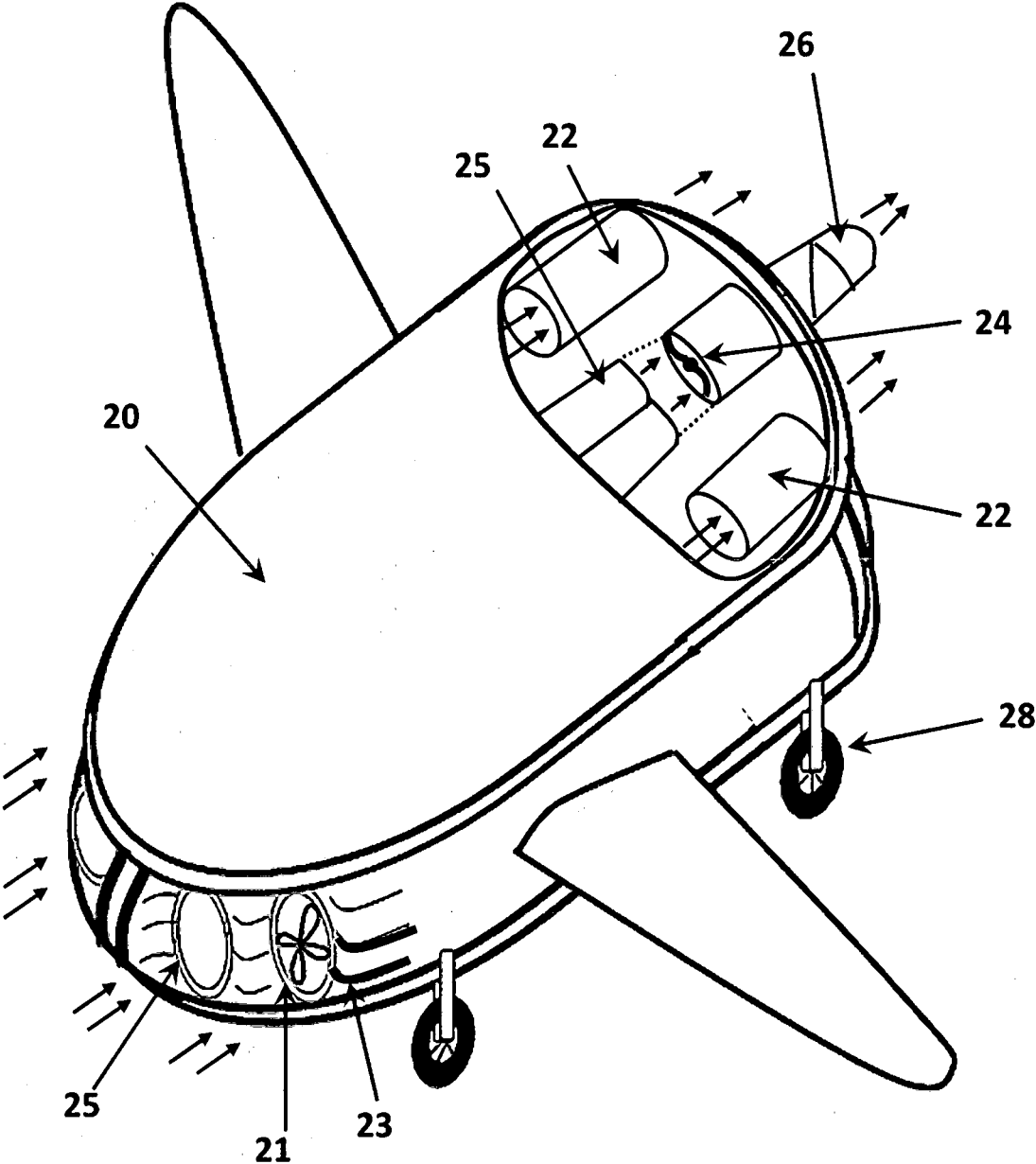


FIG. 1- B

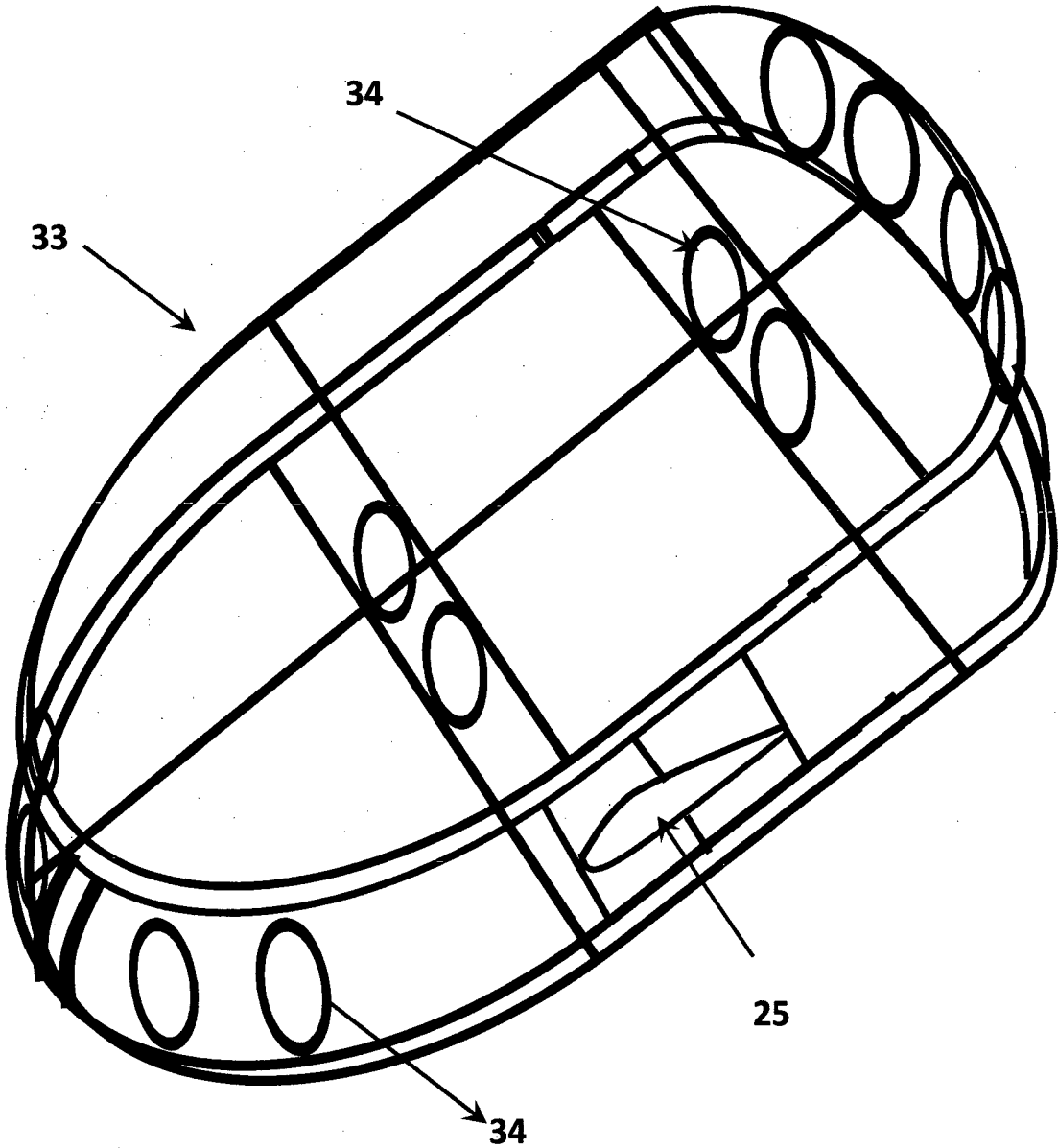


FIG. 2

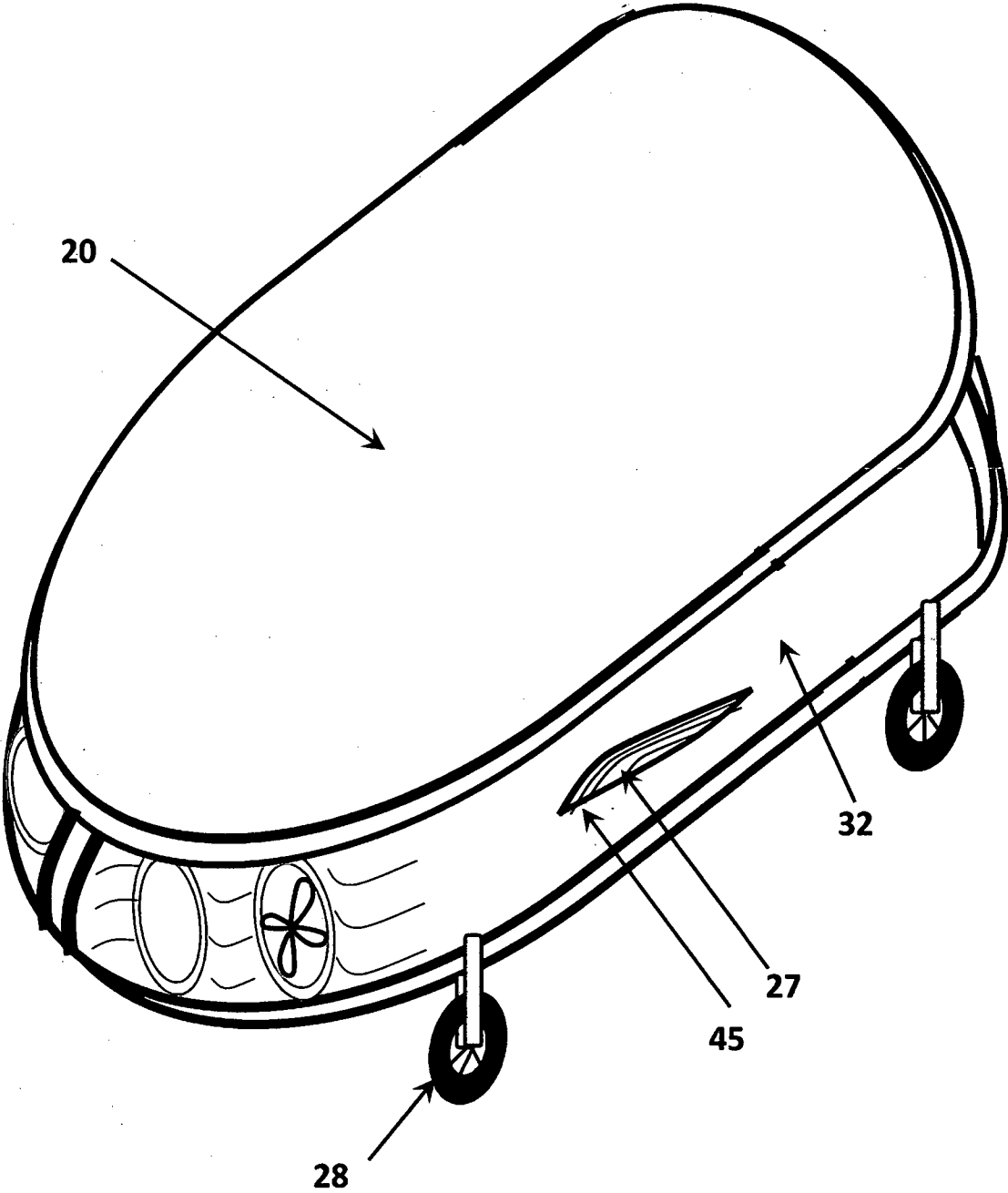


FIG. 3

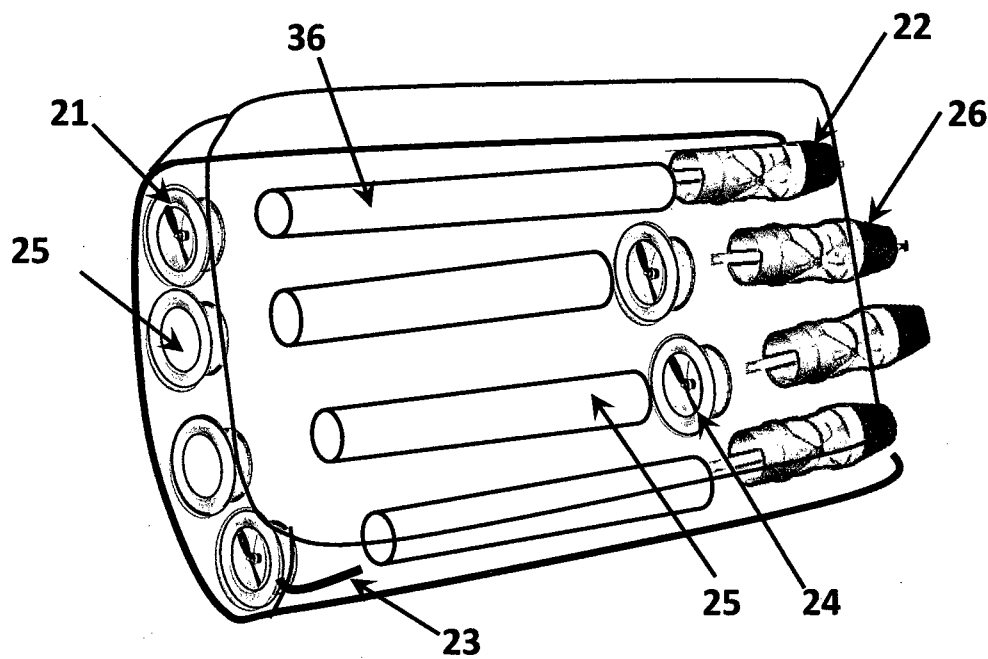


FIG. 4 - A

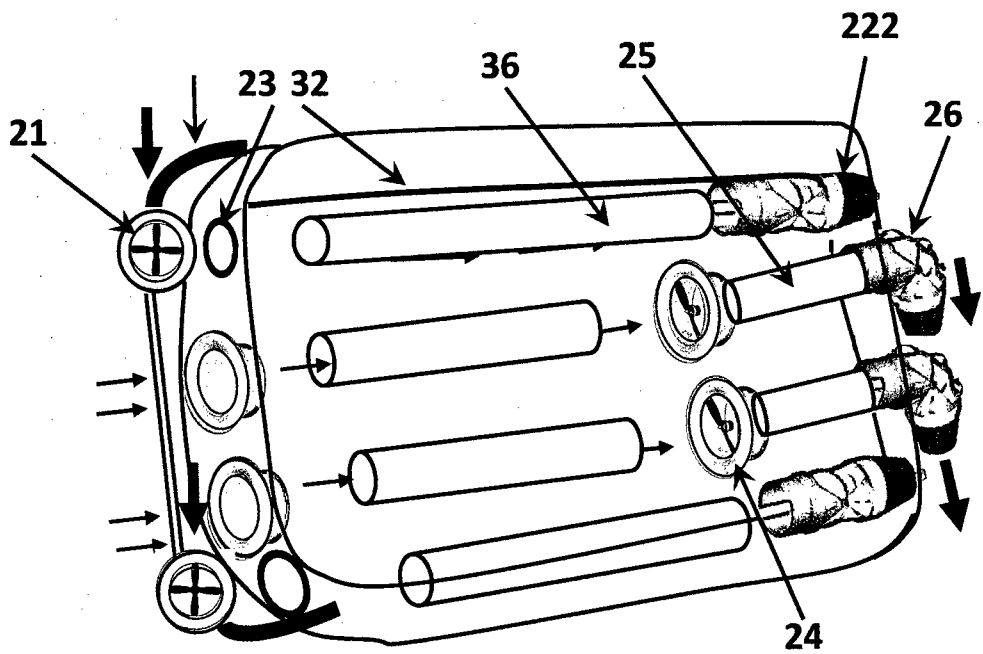


FIG. 4 - B

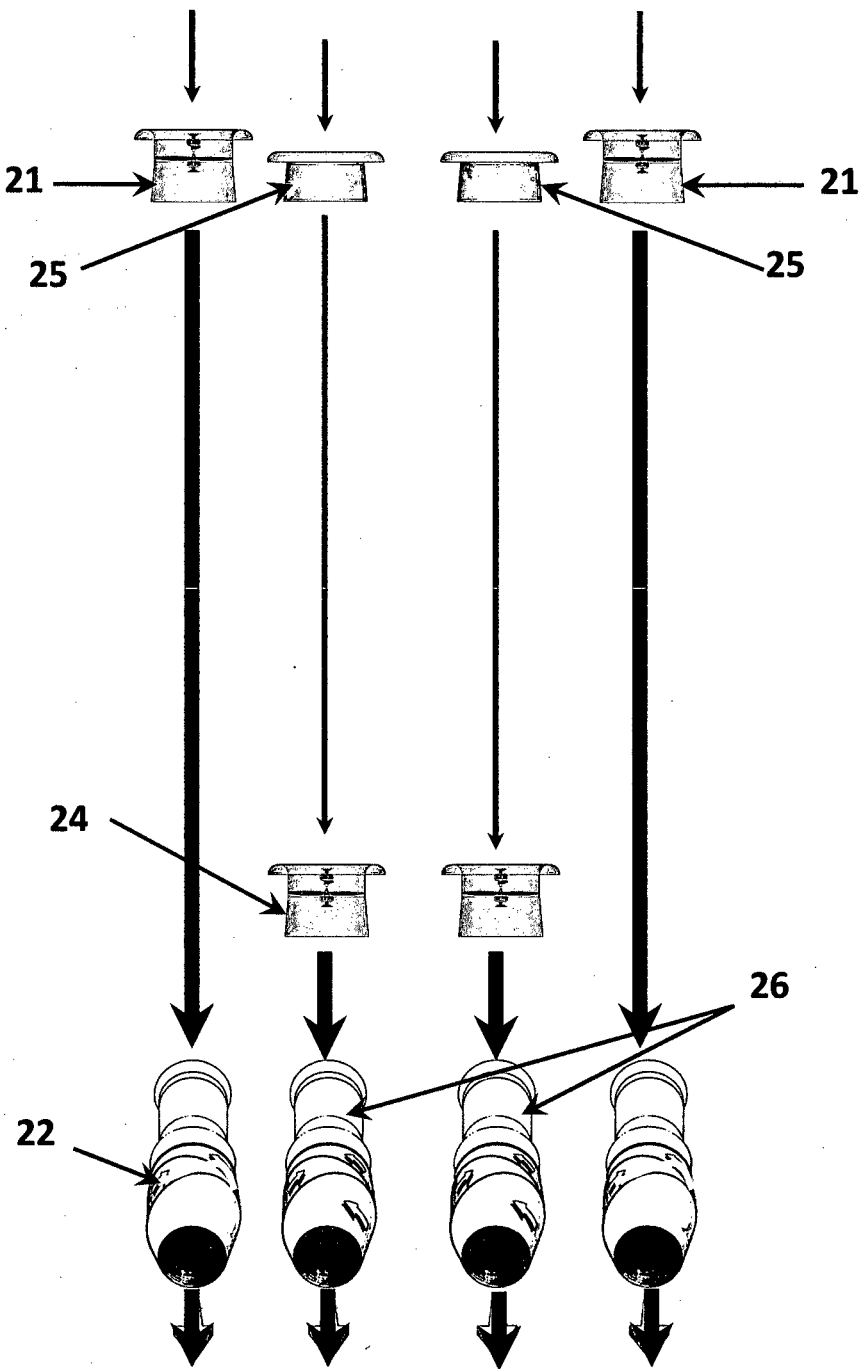


FIG. 4 - C

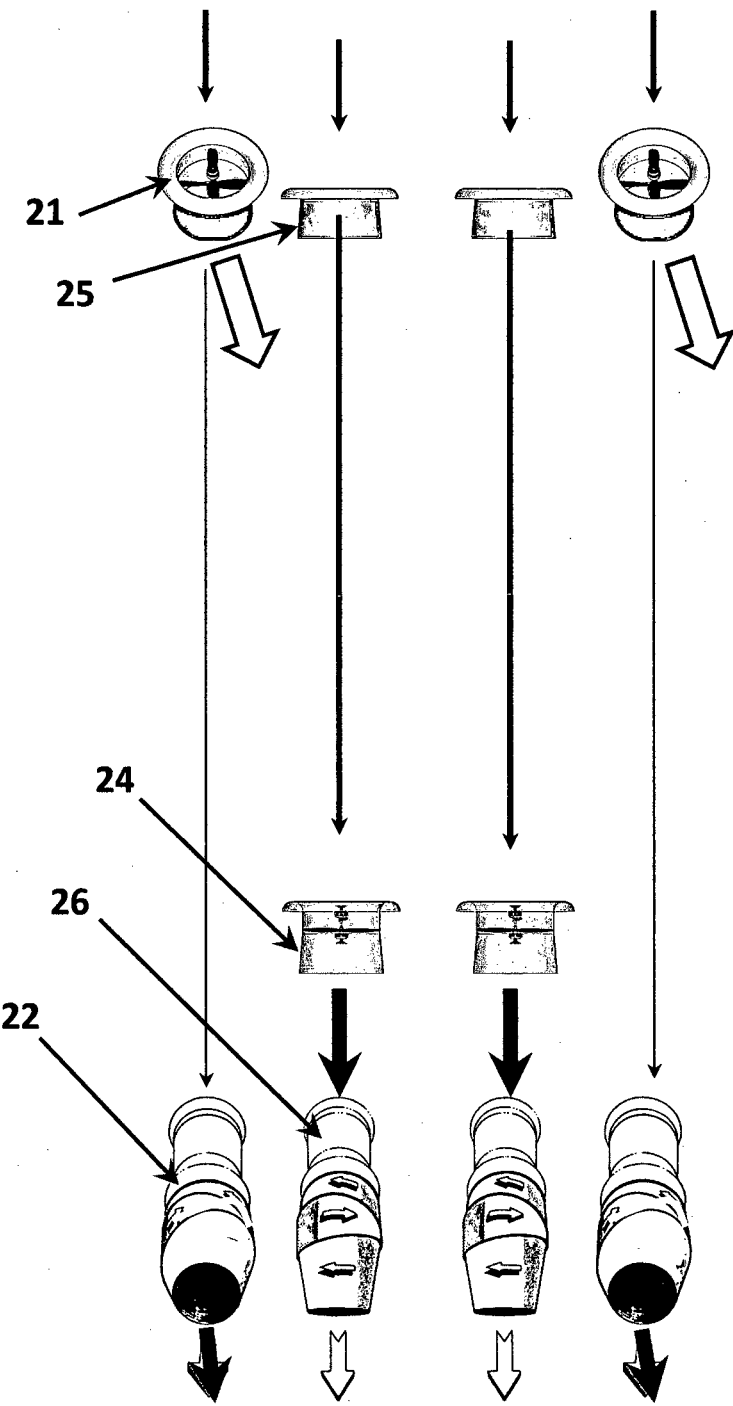


FIG. 4 - D

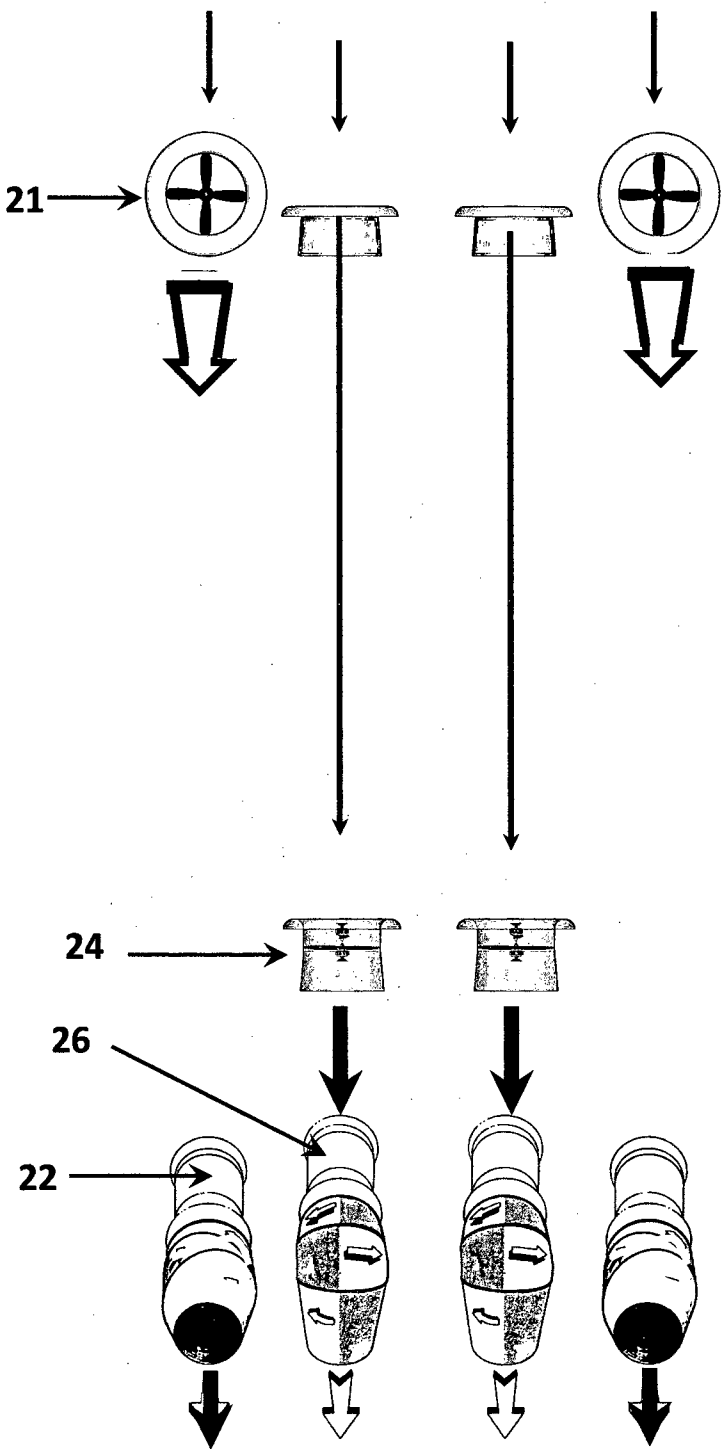


FIG. 4 - E

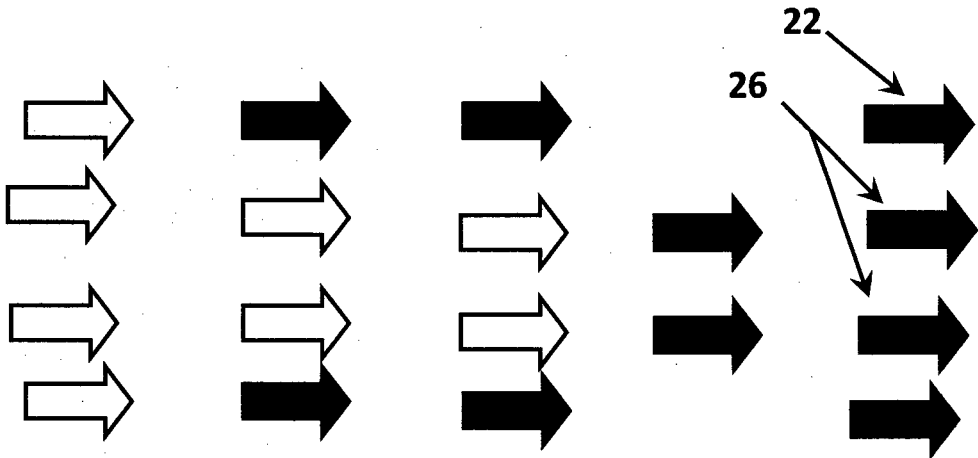


FIG. 4 - F

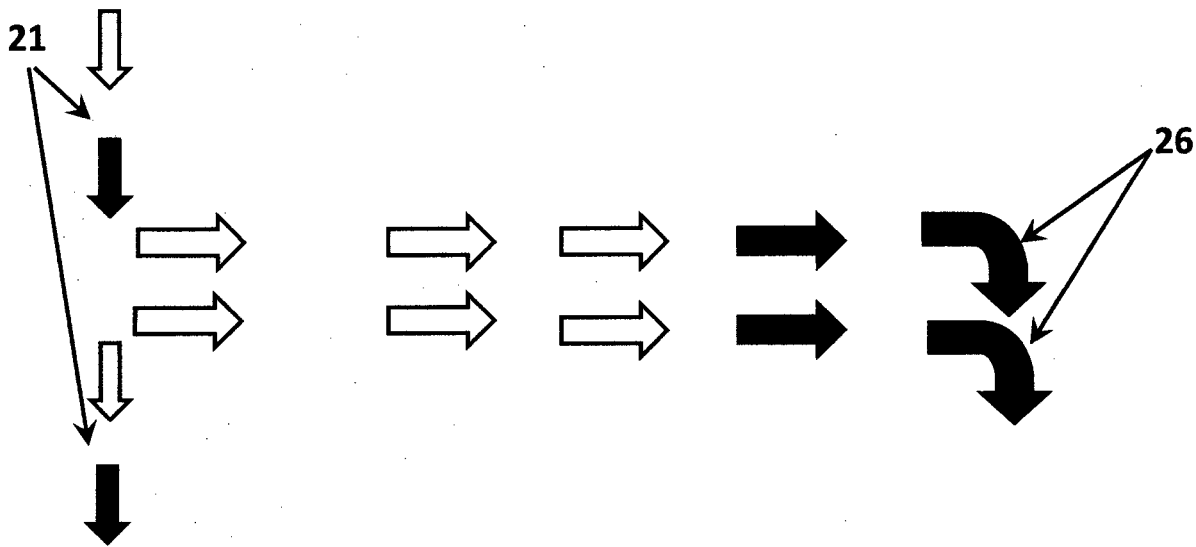


FIG. 4 - G

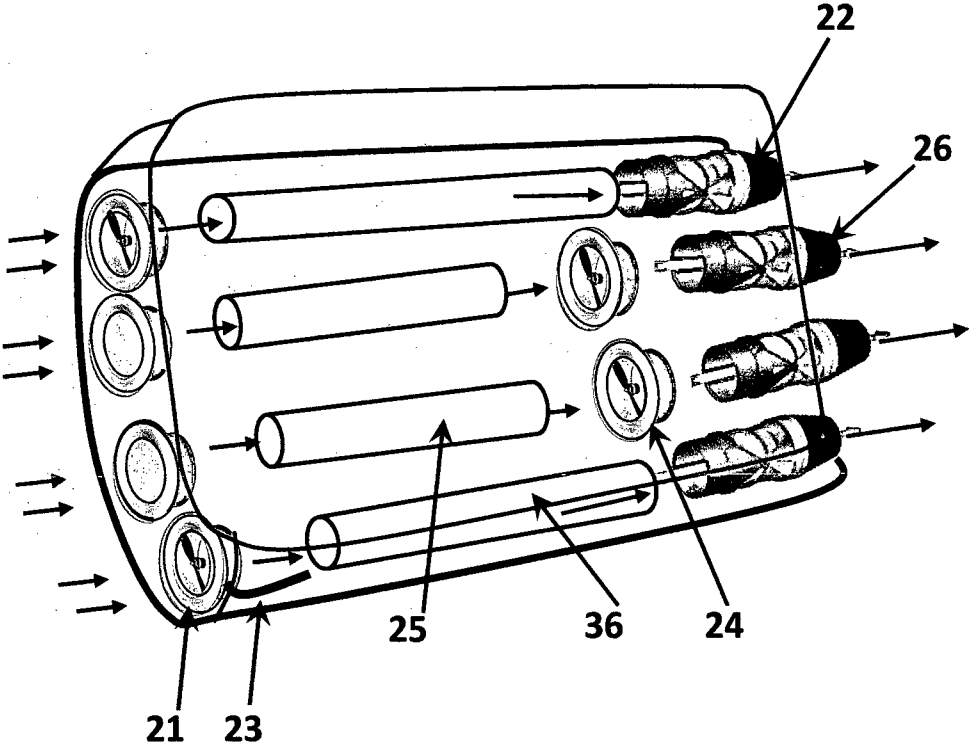
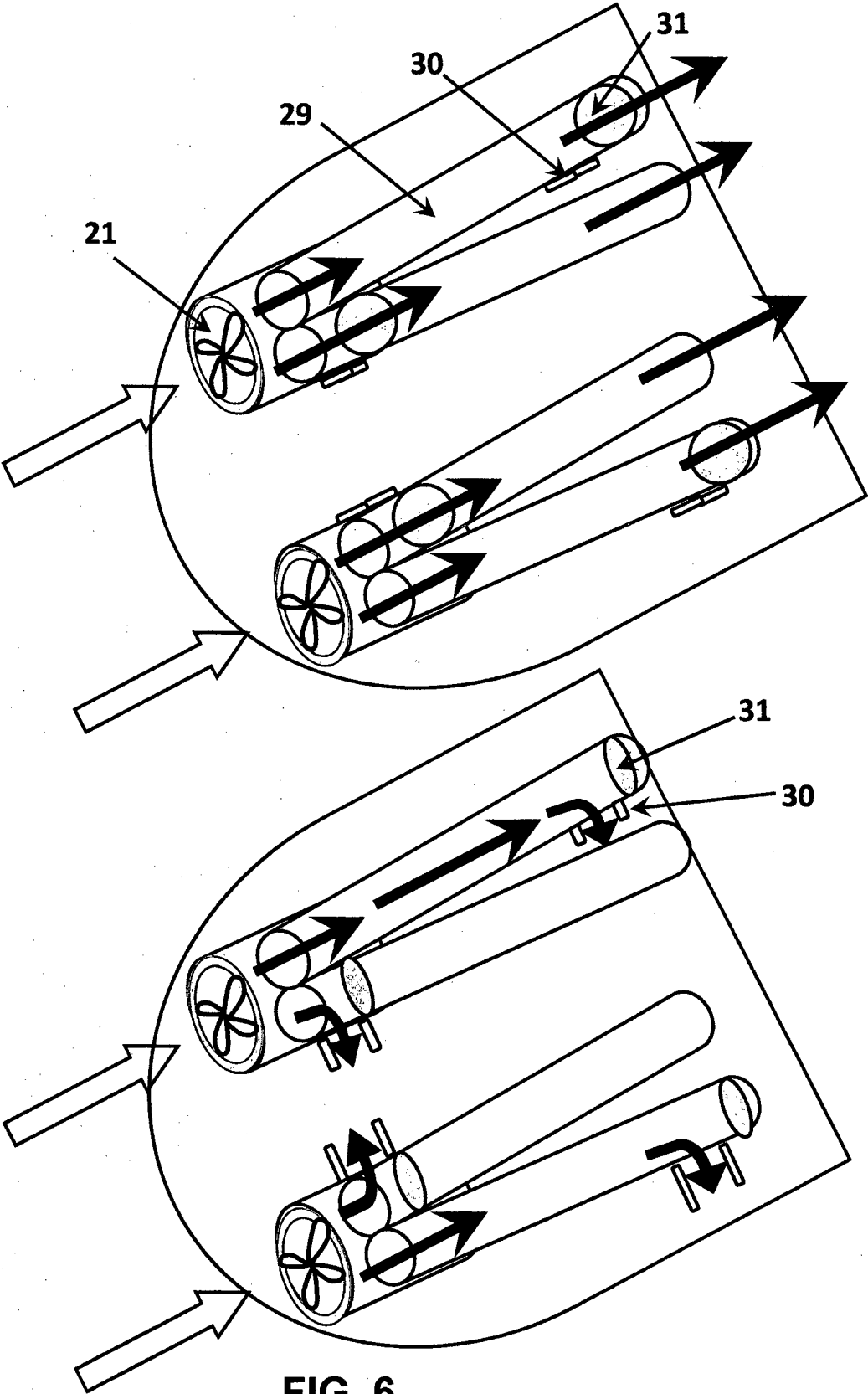


FIG. 5



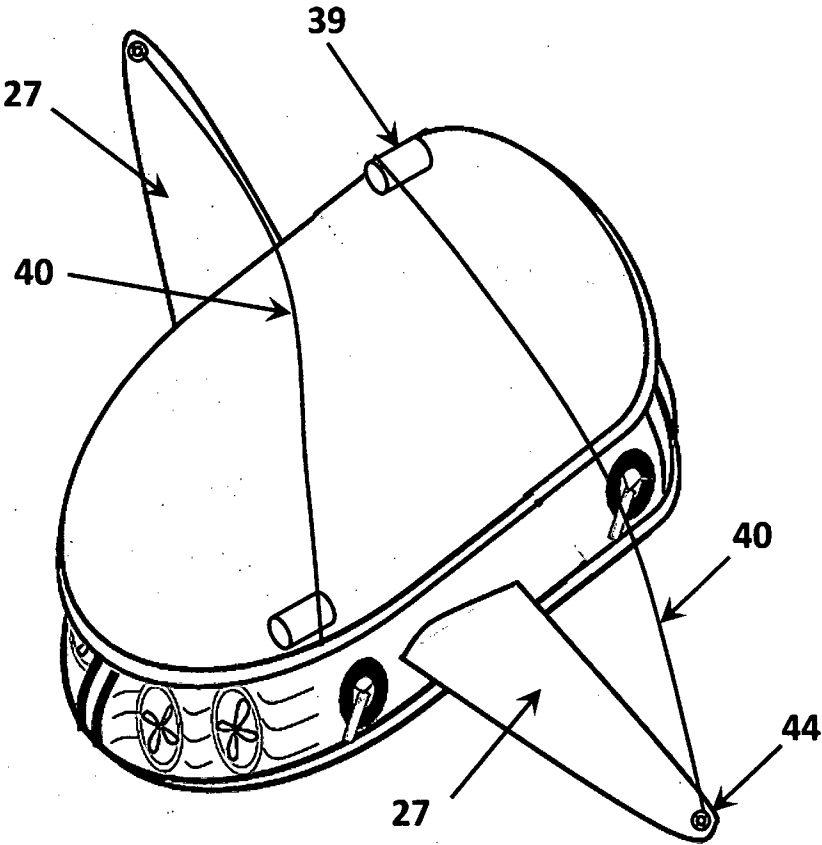


FIG. 7- A

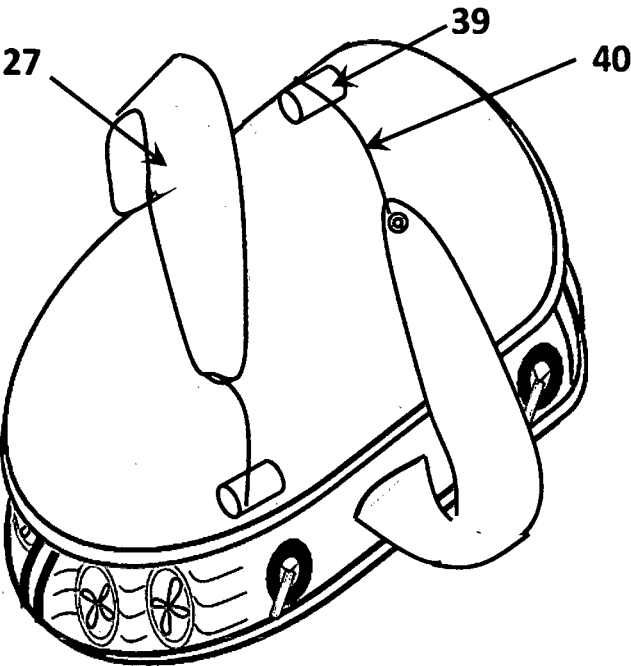


FIG. 7- B

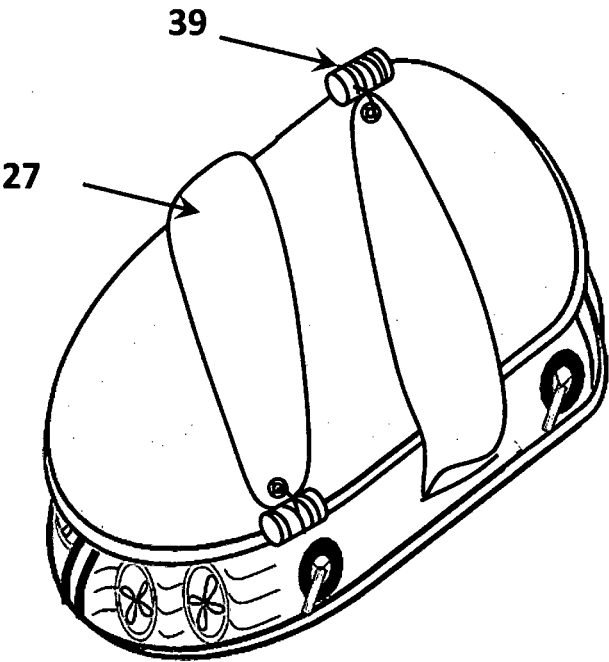


FIG. 7- C

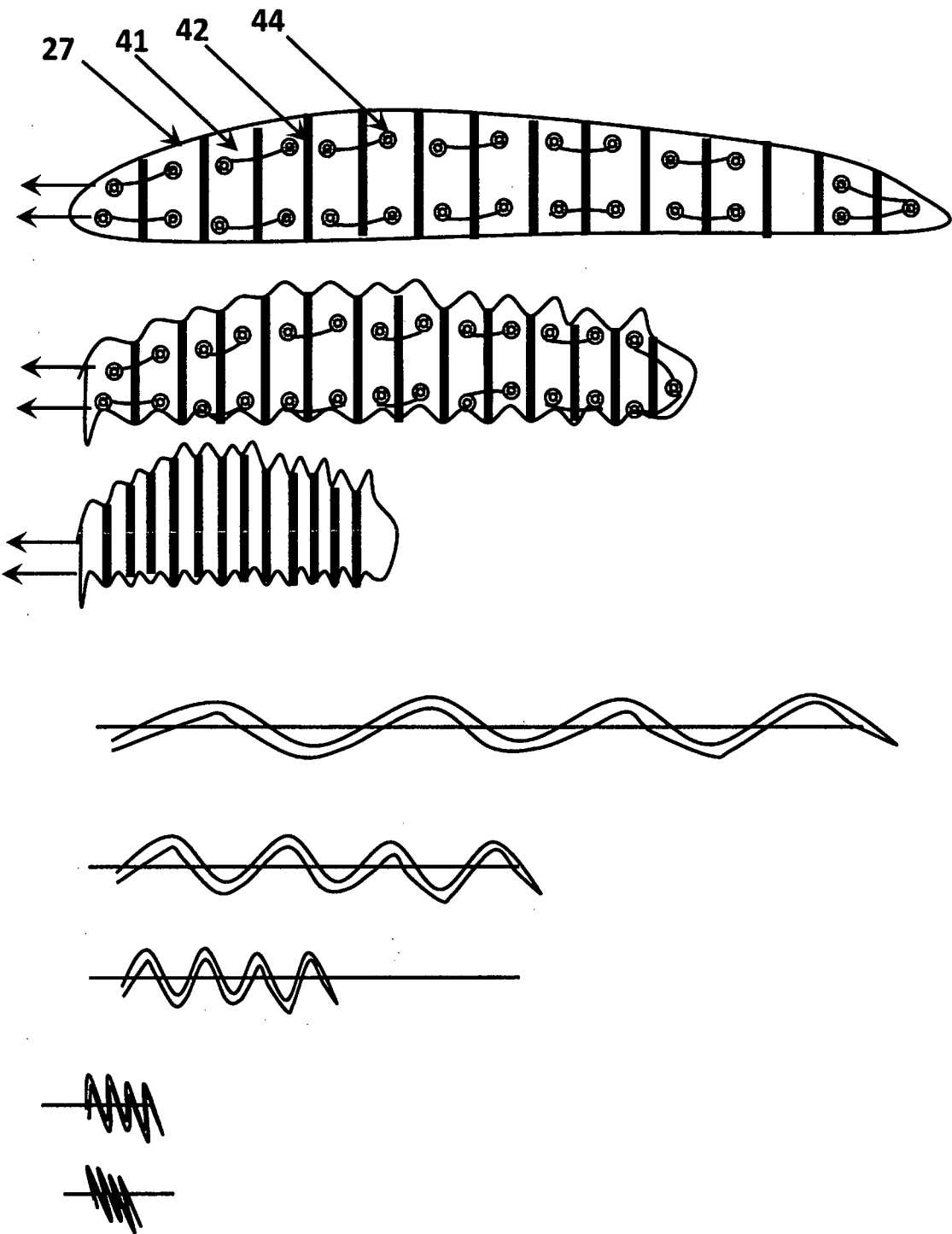


FIG. 7- D

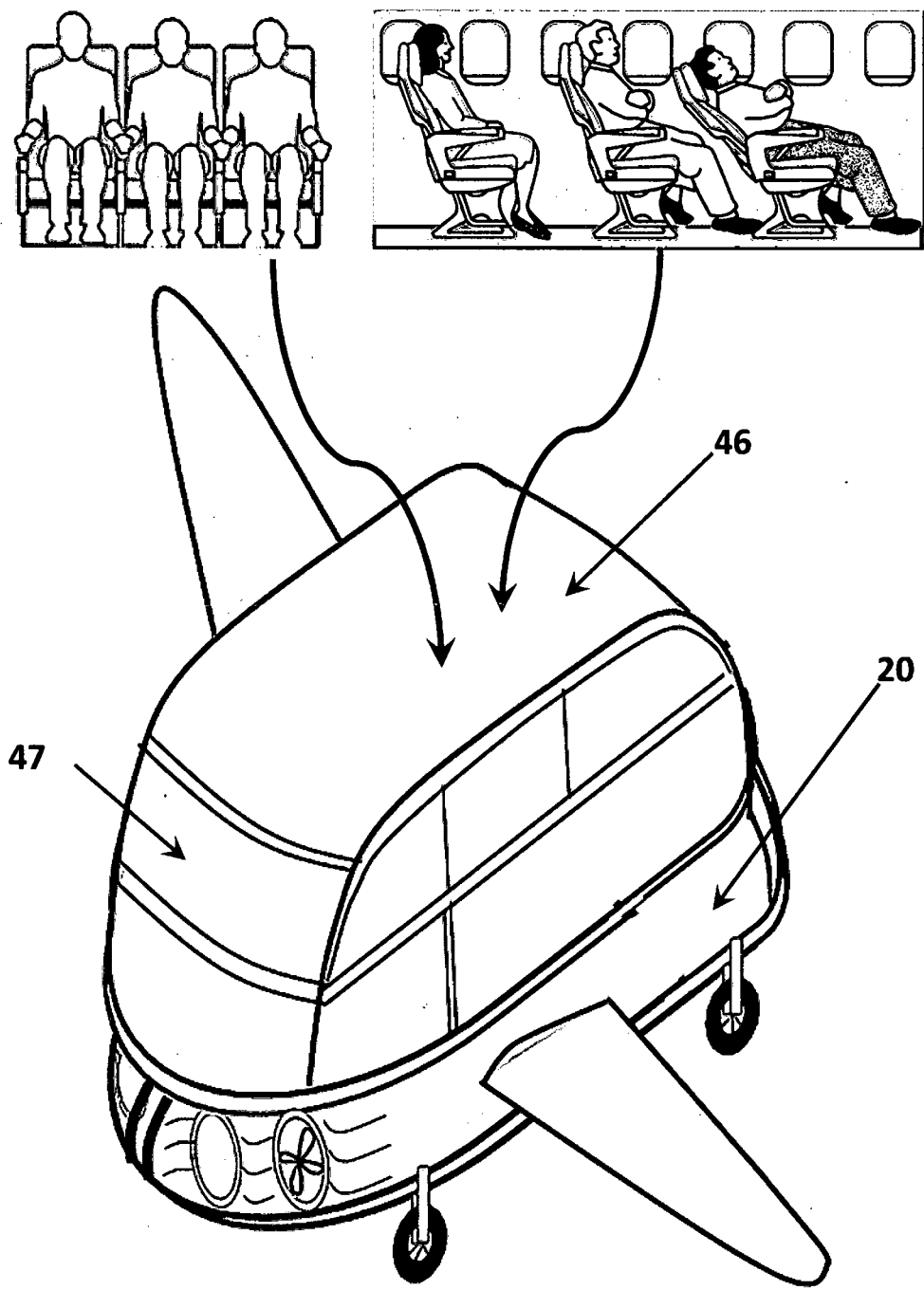


FIG. 8

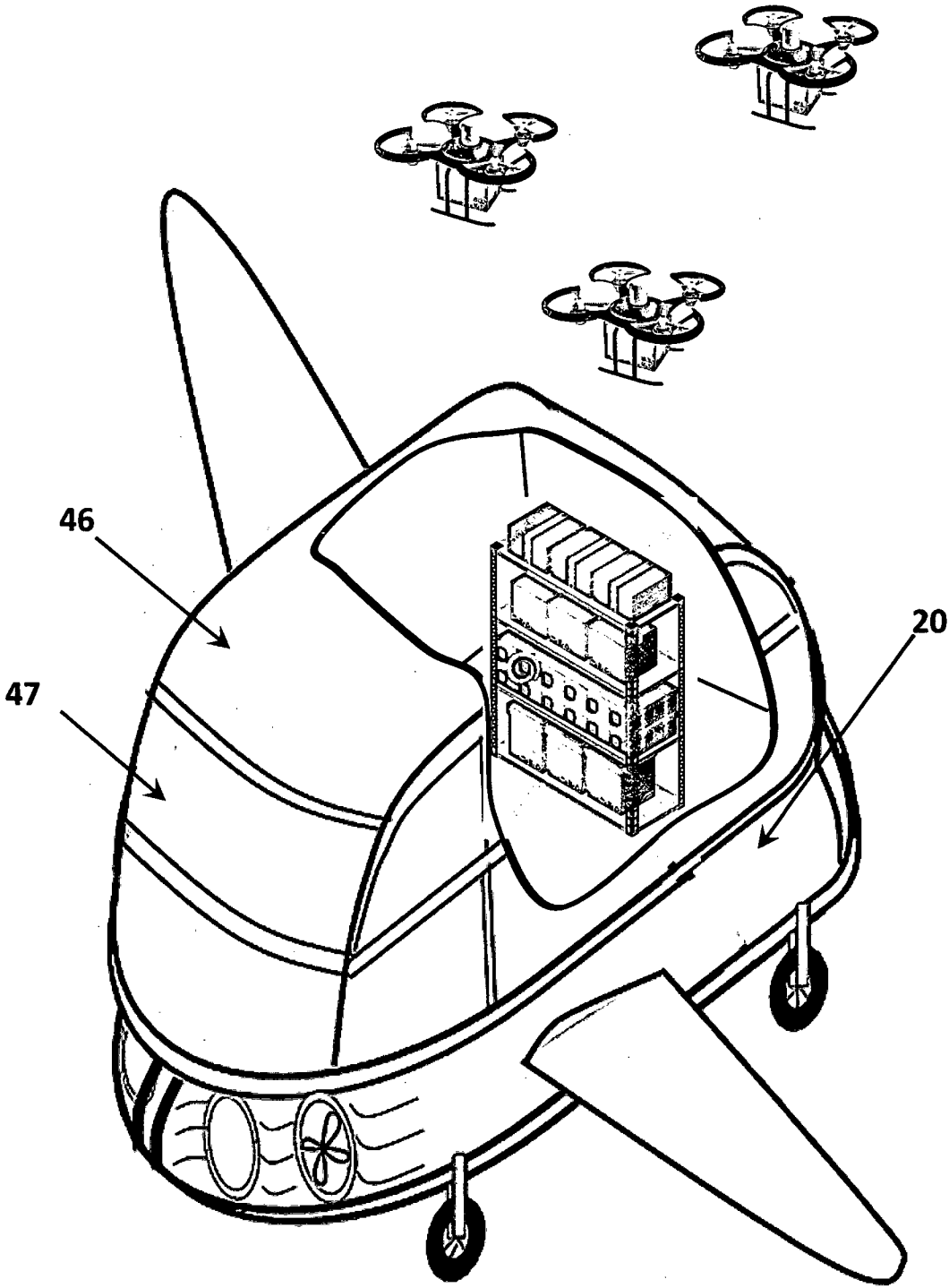


FIG. 9

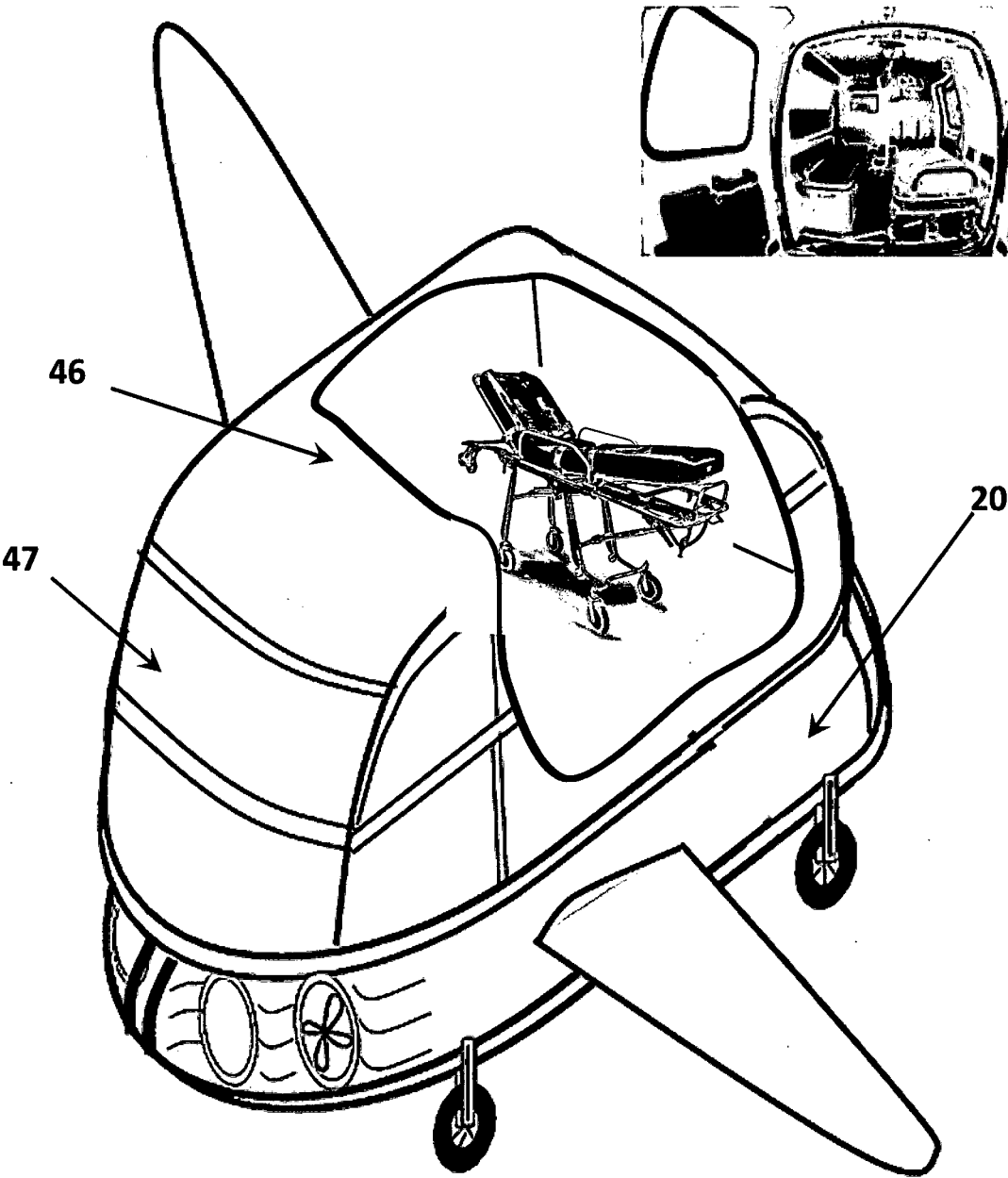


FIG. 10

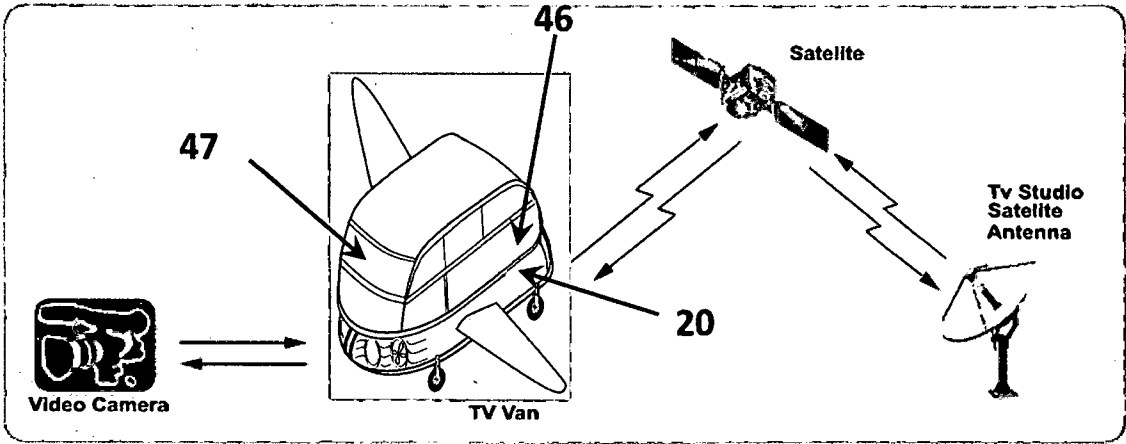


FIG. 11

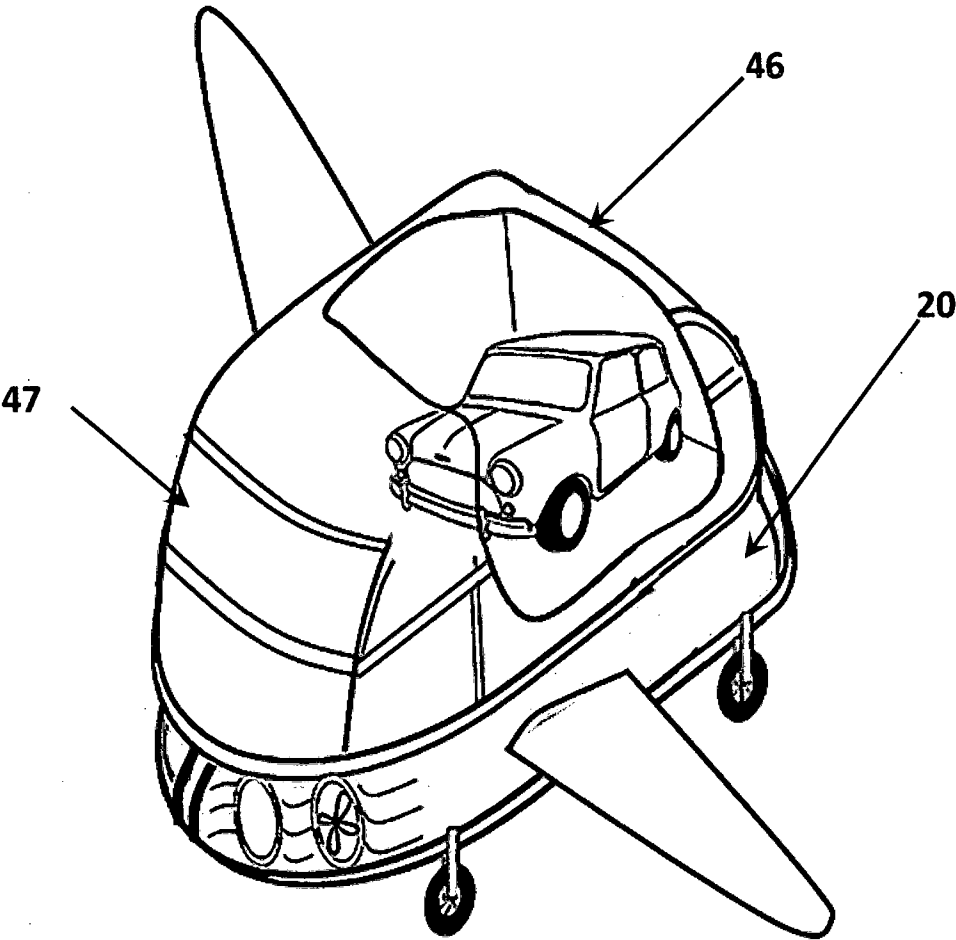


FIG. 12

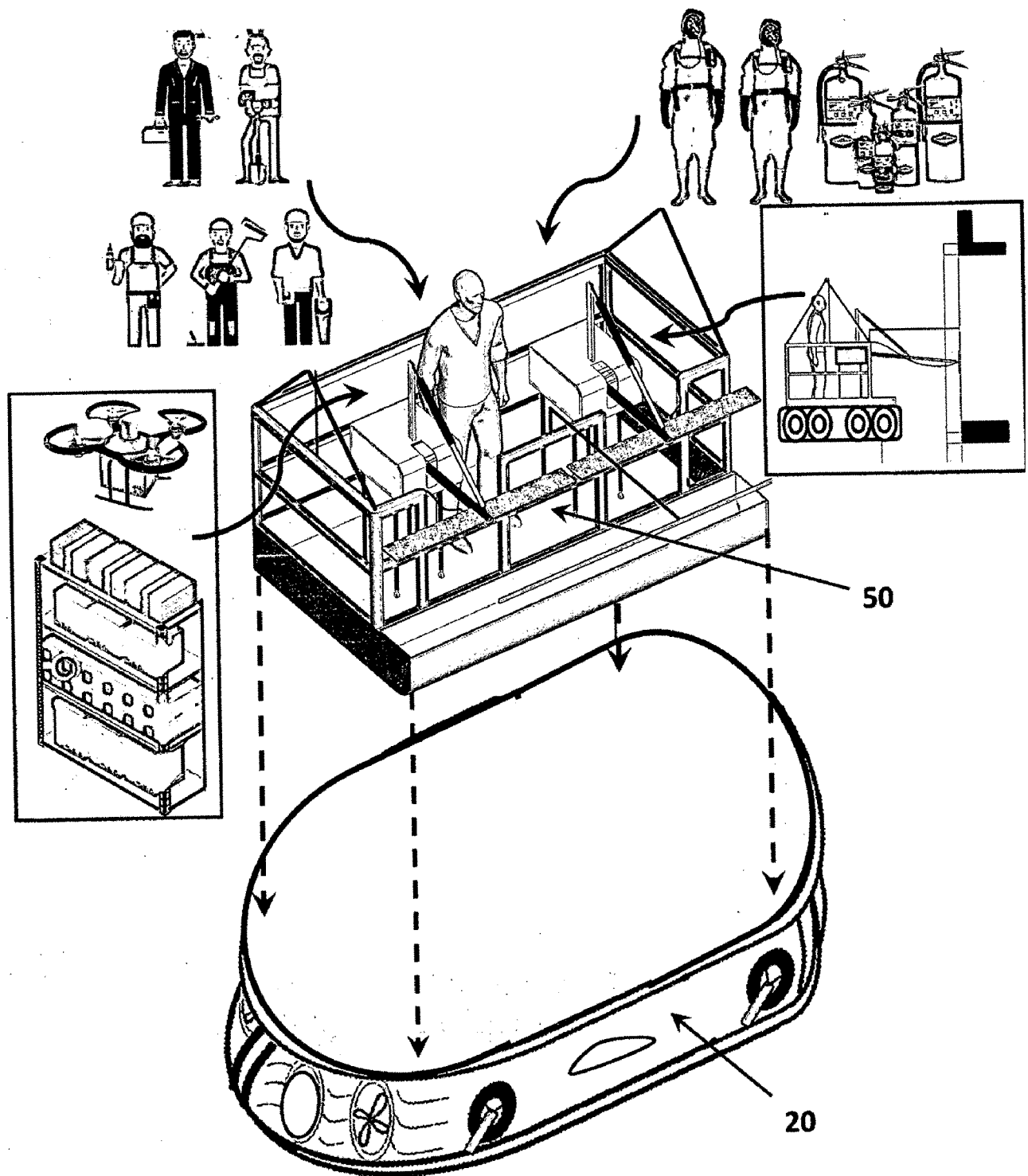


FIG. 13

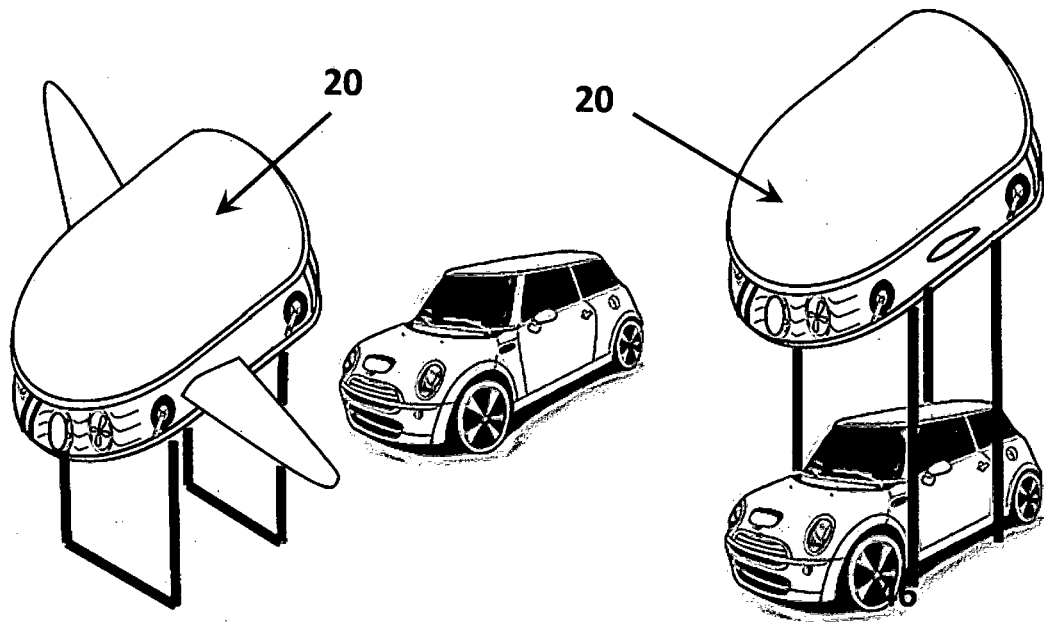


FIG. 14

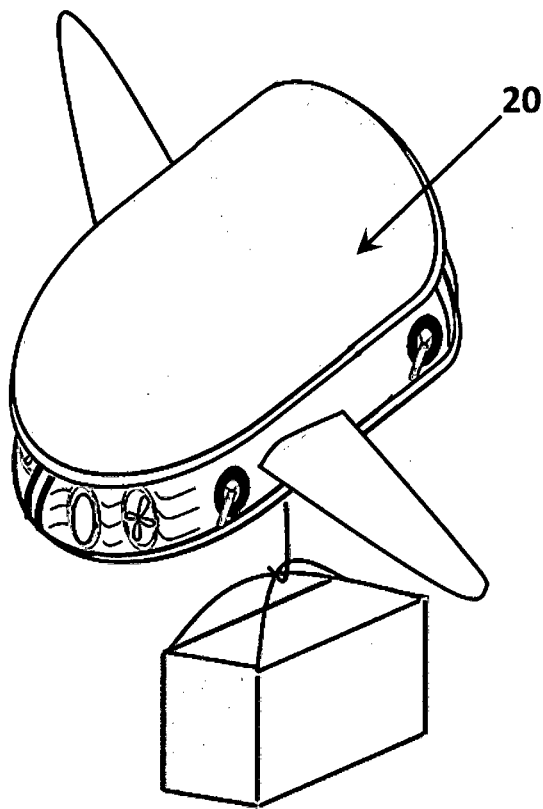


FIG. 15