(12) INNOVATION PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2009100459 A4**

(54) Title
Vectored thrust operating system

(51) International Patent Classification(s)
B64C 29/00 (2006.01)

(21) Application No: **2009100459** (22) Date of Filing: **2009.05.14**

(45) Publication Date: **2009.07.02**
(45) Publication Journal Date: **2009.07.02**
(45) Granted Journal Date: **2009.07.02**

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ABSTRACT

A system that can be added to any body for any medium using thrust to navigate three dimensionally remotely or manually. A Vectored Thrust Operating System VTOS.

ABLE TO FLY (A2F) SKYCAR

Air the thrust device is pointed in the desired direction to navigate three dimensionally

Air a VTOL aircraft including a fuselage with four ENGINES, FOUR vertical stabilizers and a TWO horizontal stabilizer attached to the fuselage. The fuselage and the ENGINES are lifting bodies that are configured to jointly form an aerodynamic lifting body which cooperates with the horizontal stabilizer to provide aerodynamic lift to the aircraft in forward flight. THE ENGINES CAN BE ANY DIVICE THAT CAN PRODUCE THRUST SIGNIFICANT ENOUGH TO PRODUCE LIFT FOR THE WHOLE BODY AND ITS PAYLOAD. ALL ENGINES MOVE SIMILATIONIOUSLY AND IN UNICEN FOR THREE DIMENTIONAL FLIGHT.A DOUBLE ARTICULATED MOUNT OR ROTATING STEERING AXLE GIVE A predetermined range of angles from the horizontal WITHOUT THE LOSS OF LIFT THRUST OR THE NEED FOR REAR VANES OR NOZZLES. INTERNAL COMBUSTION ENGINES REQUIRE A DRY SUMP. WATER COOLED IC ENGINES ALSO REQUIRE A FIXED RADIATOR IN THE FULELAGE. AN ENGINE CAN BE two rotary engines directly driving corresponding fans which face each other and operate in counter-rotating directions. Each engine POD CAN utilize the dynamic pressure of the air behind the fans to provide a source of air for cooling the rotors and exhaust system. A triple redundant computerized flight control system maintains the stability of the aircraft as it transitions from one flight regime to another as well as in flight.

Water the thrust device is pointed in the desired direction to navigate three dimensionally

Vacuum the thrust device is pointed in the desired direction to navigate three dimensionally

Editorial Note for 2009100459

The description comprises 5 pages

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFCATION

INNOVATION PATENT

Category

5 Mechanical

(applied Physics/Electronics)

IMPROVED OPERATING SYSTEM FOR VECTERED THRUST VEHICLES

VTOS

AN: 2009100459

The following statement is a full description of this invention including the best method of performing it know to me Darren George Webster:

Improved Thrust Vector Control

To date thrust in various craft is mostly fixed. Vertical Take Off and Landing VTOL bodies as the Harrier Jump jet (Fig 62,web page 2) point some of the thrust downward for lift but cannot turn left or right without complex throttle control and a jet reaction control system (Fig 66). High altitude flight in low density air reduces the wing lift and pitch control also needs a jet reaction control system (Fig 66). Skycars as the Moller Skycar (Fig 68, web page 1) rotate engine pods forward back up down but also need vanes (Moller Skycar Fig 67, Urbunareo Fig 60, web page 11) for left and right. NASA's thrust vector control system TVC (Fig 1, web page8) is fixed at the rear of the unit therefore requires the whole unit to rotate up down forward back which make it not practical for passenger vehicles or "upright" platforms. Mounting both the nozzle and actuators at 90 degrees with Two or more thrusters give greater control of the unit Vectored Thrust Operating System VTOS (Fig 8). Furthermore greater control reduces the complex mathematical plotting of the vehicle. Should the platform vehicle need to be rotated for say re-entry (Fig 33) this is still possible with independent VTOS or Multi-Vectored Thrust Operating System MVTOS (Fig 25). Fly by wire allows each thruster to be inverted/reversed for precise body positioning and "aerobatic maneuvers". In a gravity medium a simple Gyro Stabilizer (Fig 20) can be used mounted with a single or double micro actuator (Fig 12) and it too can be Vectored VGS to automatically induce the platforms rotation, pitch or tilt again without any need for complex math's. Muliti-combination joysticks (Fig 39) can give unlimited control and the latest defense helmets (Fig 40-43) offer hands free control or unmanned Vehicles (Fig 46, web page 7,14) . The vectored thrust operating system can be mass produced using readily available parts (Fig 13,14,15) or Able to Fly A2F Skycar (Fig 47) and A2fLT (Fig 16). Electric powered VTOL craft (Fig 56, web page 9) EVTOL .

ABLE TO FLY (A2F) SKYCAR

VECTORED THRUST OPERATING SYSTEM

A2F-VT-OS

Steering and operating system for vectored thrust vehicles

Able 2 Fly Lift Truck A2FLT and Able 2 Fly Double Slew A2FDS

APPLICATIONS

Able 2 Fly takes all the latest technology to make a very simple operating system that can OPERATE in any medium of air, water or vacuum (outer space)

The skycar is a great example that can take off and land as a helicopter, fly as fast as a jet, be as easy to operate as a car, and fully computer programmable.
This system **deletes** the **vanes** in **ducted fans** and the **jet reaction control system** as stated in the "MOLLER SKYCAR" or "HARRIER JUMPJET" take off and landings and high altitude flying. Rotating the engine thrust in **both** the **vertical** and **horizontal** which gives three dimensional control and with smaller engines being fully rotated **without** the **loss** of **lift thrust** through redirection i.e.

1. vanes or
2. Loss of thrust in reducing engine throttle to induce yaw by differential.

Again this concept works in water for submarines or a vacuum out space which use a fixed propulsion system at the rear of the unit.

1. Google Image Result for http--www_moller_com-files-airflow_gif.mht
2. Google Image Result for http--www_harrier_org_uk-history-images-Figs_9_Nozzle_selector_lever_jpg.mht
3. Google Image Result for http--www_cyberauto_com-KORDI-images-FelberTTD2_jpg.mht
4. Google Image Result for http--www_gcilift_com-assets-images-db_images-db_Jib1_jpg.mht
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6. Google Image Result for http--www_urbanaero_com-Tech_images-X-Hawkvanessmall_jpg.mht
7. hhoneywell unmaned.mht
8. Thrust Vector Control - Ares I Upper Stage.mht
9. Magnetically Levitated Ducted Fan Being Developed as a Propulsor Option for Electric Flight.mht
10. United States Patent 6450445.mht
11. Urban Aeronautics.mht

12. United States Patent 4795111.mht United States Patent 5115996.mht

13. volator patent.mht

14. df drone.mht

15. RC Submarines Underwater - Diving Systems and Lost Subs.mht

16. Newton's Third Law of Motion.mht

Patents Act 1990

The claims defining the invention are as follows:

1. Thrust is pointed in the desired direction of motion as claimed in a thrust vector control TVC in any vector to the body a Vectored Thrust Operating System VTOS.
2. Thrust is pointed as claimed in claim 1 by means of a Double Actuator DA or Double Slew DS 90 degrees to each other
3. A Double Actuator as claimed in claim 2 is hollow for gases and liquids with external arm or slew ring gear DS-GL.
4. Thrust can be mounted as claimed in claim 2 by a rotating a cars steering arm a Lift Truck LT
5. Gyro stabilizers pointed as claimed in claim 1 and 2 to rotate the body to the thrust VGS.
6. VTOS as claimed in claim 1 incorporating all or only 1 of claim 2-5 can be added or multiplied to any body.
7. A VTOS as claimed in claim 6 operates in any medium.
8. The VTOS as claimed in claims 6 operated independently of one another in a Multi-Vectored Thrust Operation System MVTOS.

Darren George Webster 11 May 2009

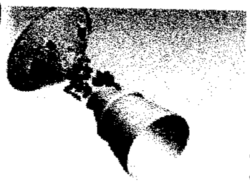


Fig 1

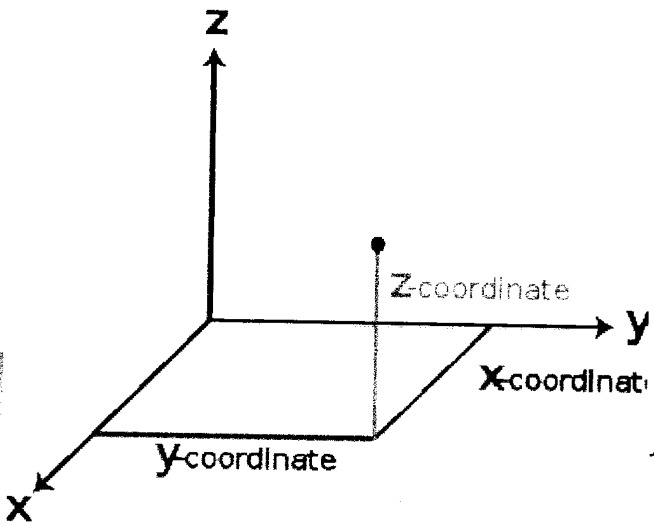


Fig 2

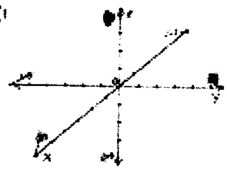


Fig 3

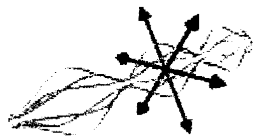
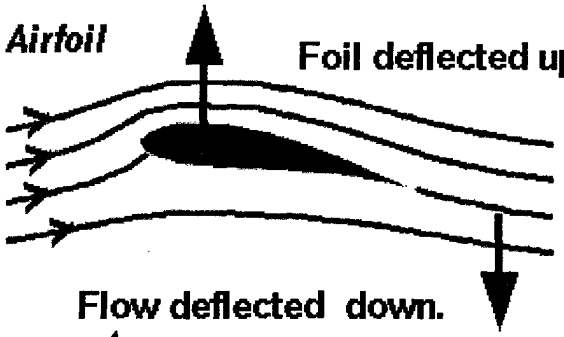


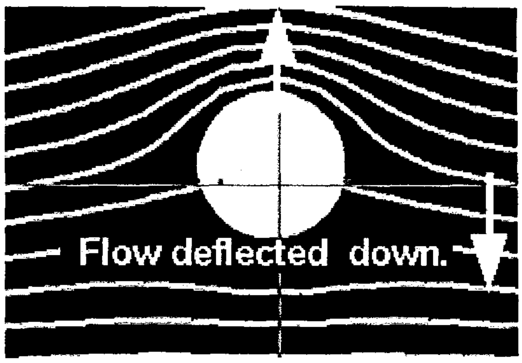
Fig 4

Newton's Third Law
Applied to Aerodynamics

Glenn Research Center

For every action, there is an equal and opposite re-action.





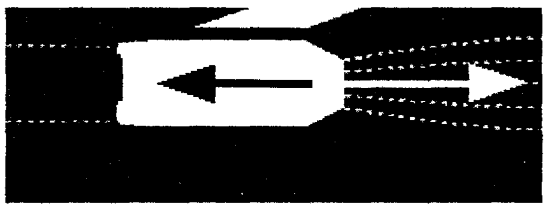


Fig 5 Fig 6 Fig 7

Sir Isaac Newton first presented his three laws of motion in the "Principia Mathematica Philosophiae Naturalis" in 1686. His third law states that for every action (force) in nature there is an equal and opposite reaction. In other words, if object A exerts a force on object B, then object B also exerts an equal and opposite force on object A. Notice that the forces are exerted on different objects.

For aircraft, the principal of action and reaction is very important. It helps to explain the generation of lift from an airfoil. In this problem, the air is deflected downward by the action of the airfoil, and in reaction the wing is pushed upward. Similarly, for a spinning ball, the air is deflected to one side, and the ball reacts by moving in the opposite direction. A jet engine also produces thrust through action and reaction. The engine produces hot exhaust gases which flow out the back of the engine. In reaction, a thrusting force is produced in the opposite direction.

Engineering

1. Double slew mounts would turn engine pods and rocket thrusters or **A2FDS (Fig 8)**.

Mounting two actuators at 90 degrees like NASA's TVC (Fig 1) or a horizontal articulated base that can rotate 360 degrees down, forward, up, backwards. The second articulated slew mounted vertically that rotates 360 degrees steers left or right. The thrust unit mounted at 90 degrees to it.

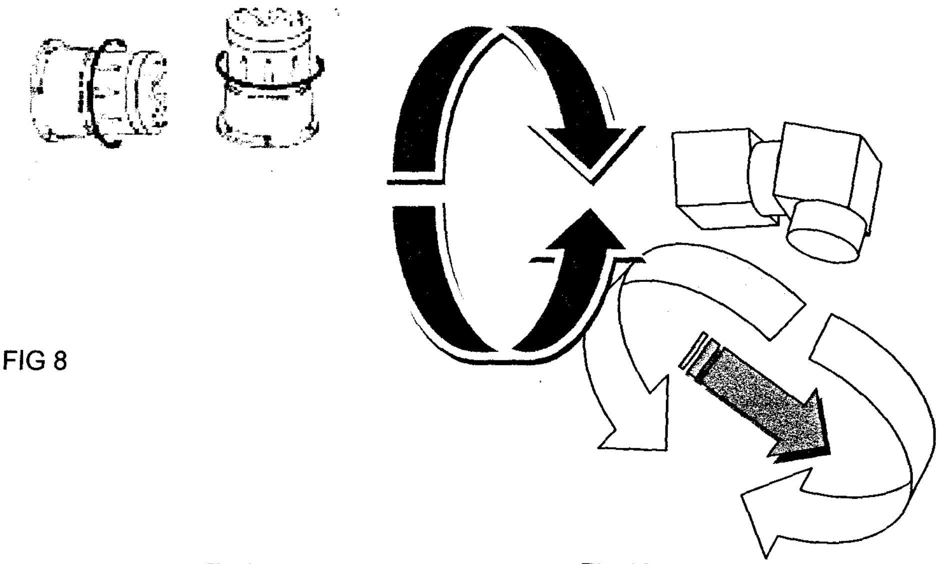


FIG 8

Fig 9

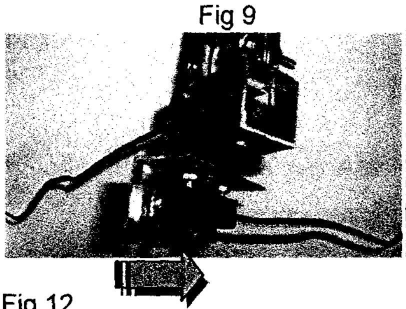


Fig 10

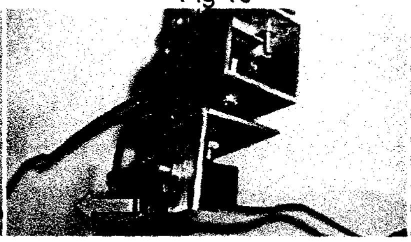


Fig 11

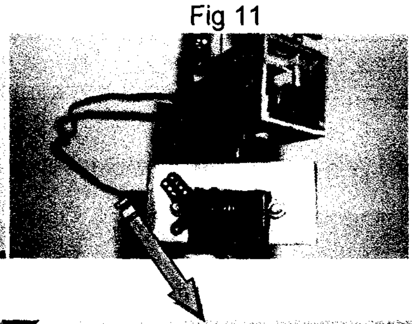
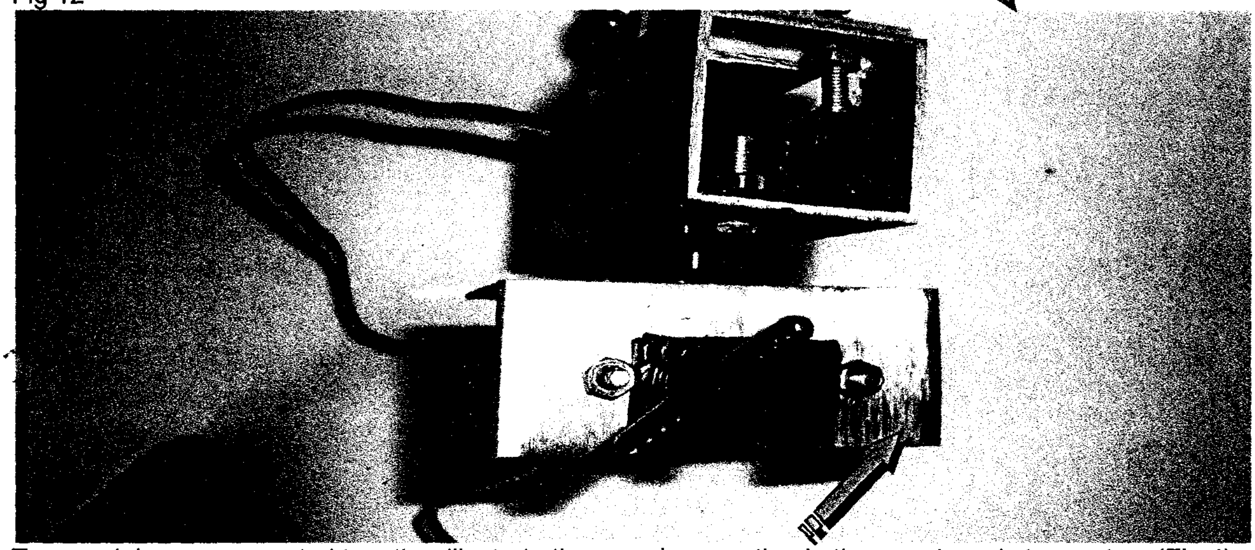


Fig 12



Two model servos mounted together illustrate the ease in operating in the x and y axis to create z (Fig 4) 3 dimensional flight and rotation of gyros to confuse the body into rotation

Rotating steering arm A2FLT (mechanical)

Rotation of the engines by an axle with a car steering ram mounted directly to the axle and at the ends of the axles a steering bracket is fixed to the axle and too rotates with the axle. By this means three dimensional control is achieved and engine pods can be turned left or right at any angle up or down. Car and marine parts could also be used for mass production.

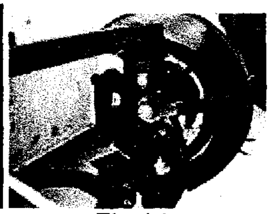
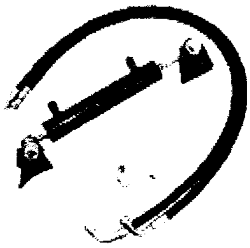
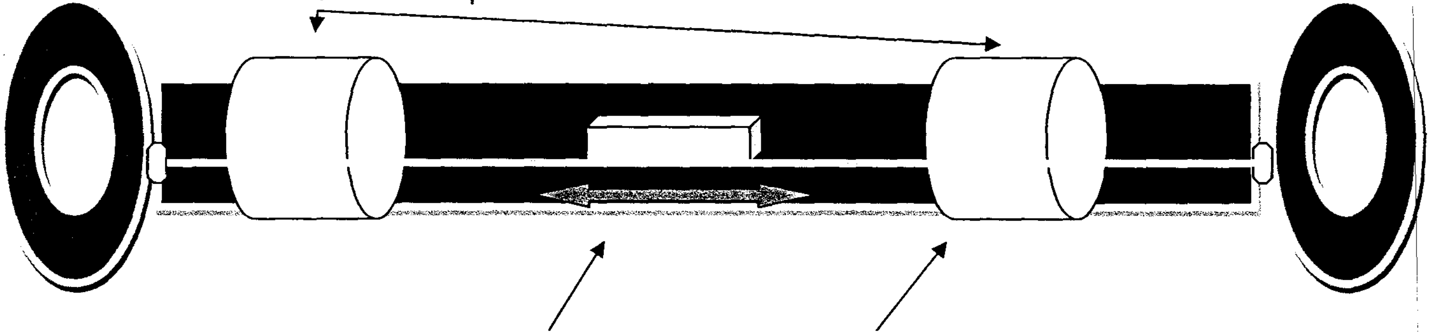




Fig 13 Fig 14 Fig 15

Fig 16

A2FLT

Bushes act as Lift points



In horizontal flight the whole steering assembly is fixed by a bush assembly and turns left and right like a standard car

Fig 17

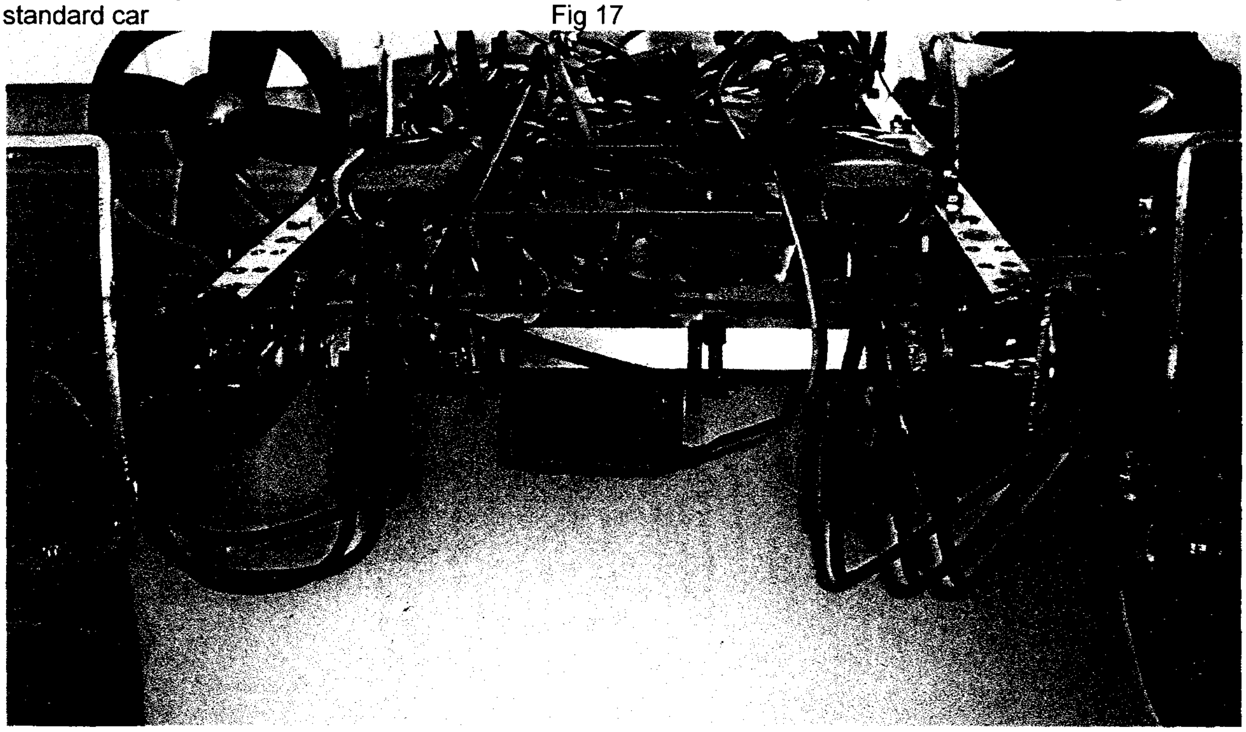
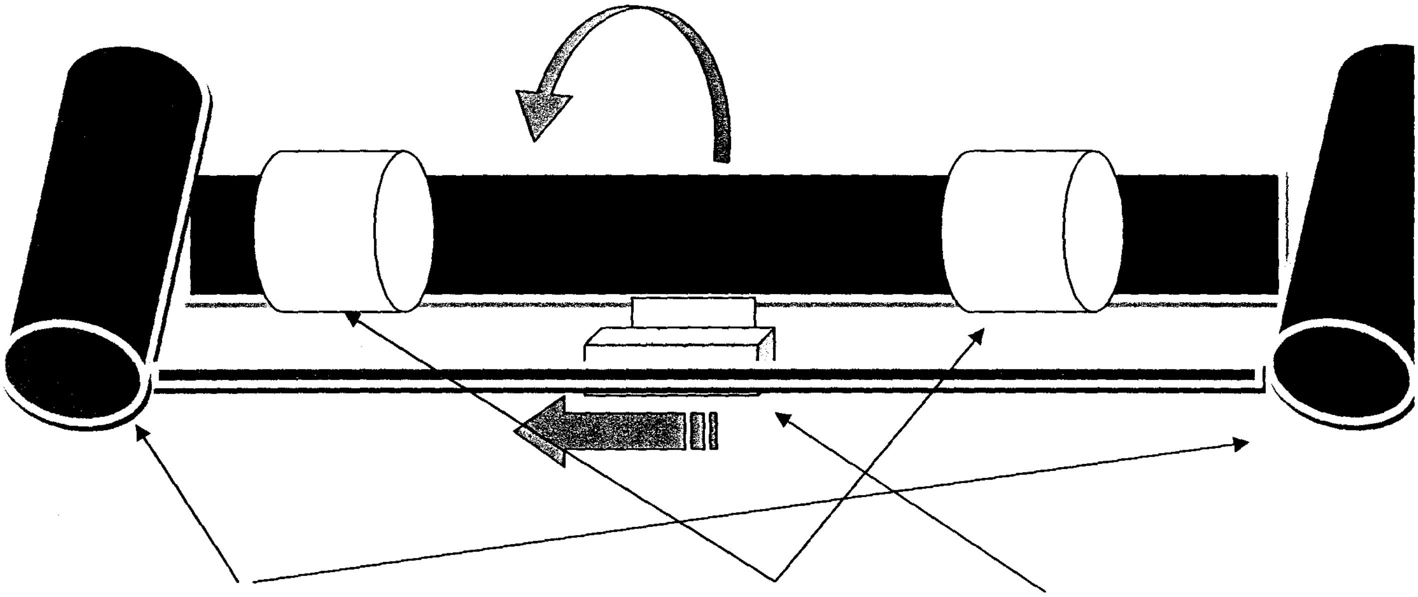


FIG 18
A2FLT in Motion



Here the engines are rotated back for uplift through the bushes and as the steering box arm assembly is mounted on the axle it too rotates with the engines and turns to the right for that angle or vector without the need for complex computer calculations. This design is made from common car parts for mass production with 330 degrees rotation in the vertical and 180 degrees in the horizontal. This means there is only three controls of **rotating** the main axle, turning **left or right**, and the **throttle** of the engines which make the whole system very easy to operate. With the added gyros as stabilizers to each engines throttle control and each steering arm autopilot and unmanned flight can be operated by the most basic of computer systems or three channel remote control. Finally by enclosing the axle and steering assembly in a wing between the engines complete with a fuel cell or tank you have an independent lift device that can be added to any cargo i.e. standard car or shipping container etc that can be operated by one person or computer

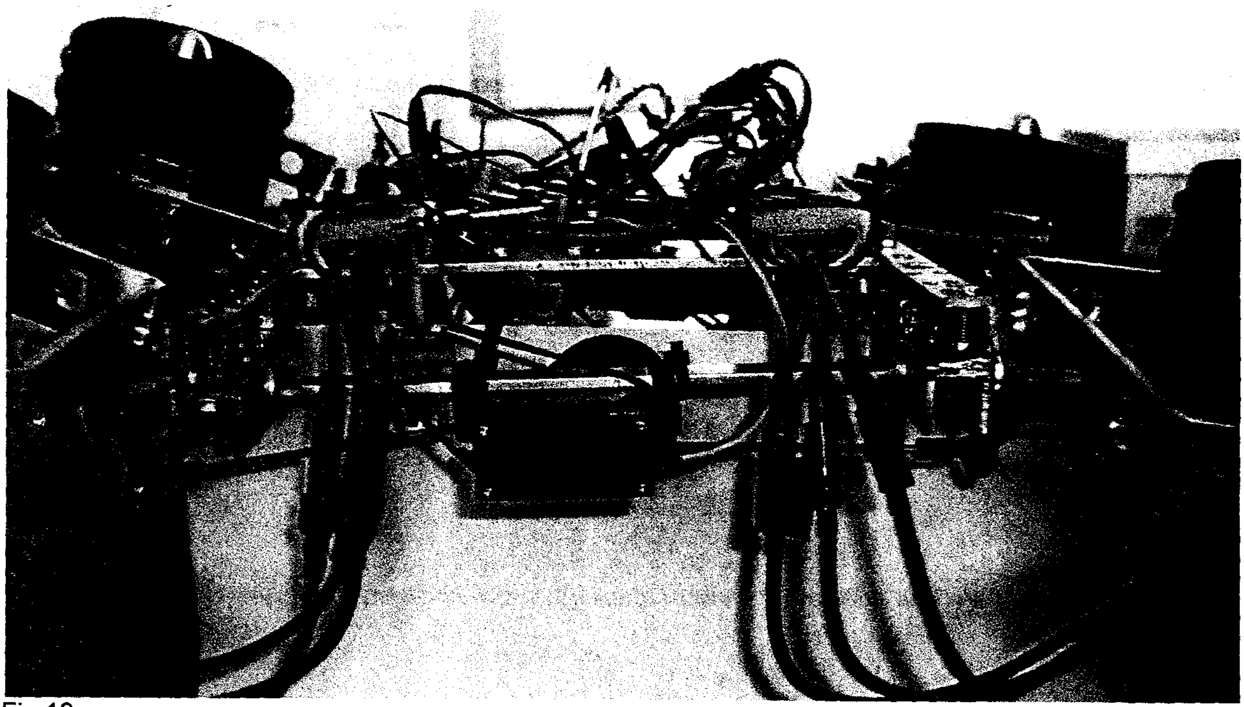


Fig 19

Applications

Military Domestic Marine Logistics Commercial Police Ambulance Security Rescue Green power primary industry

OPERATING WITH THE LATEST TECHNOLOGY

Gyro switches (Fig 20) can by added for stabilizers

1. to each speed controller slightly adjusting throttle for balance.
2. to each steering box slightly adjusting for direction and yaw.
3. to a micro A2FDS (Fig 12) to creat a Vectored Gyro Stabilizer VGS.

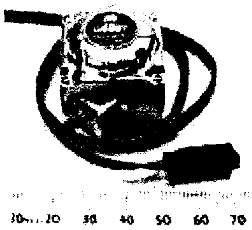


FIG 20

IC engines (Fig 21) need to be modified with a dry sump to allow full rotation and radiator(s) mounted in the central vehicle

FIG 21 "cyberauto fan" KORDI moeri wig project

GMLS2 V8 dry sump airboat fan developing 2230 lbs of thrust. Production of single seat transporter could start immediately as car parts a readily available.

Jet aircraft (Fig 22) that commonly have **two engines** mounted towards the rear and each side of the fuselage (Fig 23) could be upgraded for **VTOL** by using slightly larger engines at the rear and with additional engines **without** the need for **any modification** each side of the fuselage at the front of the aircraft with all **four engines** (Fig 24) either mounted by the double articulated **A2FDS** (Fig 8) or rotating steering arm method or **A2FLT (Fig 16)**.

FIG 22

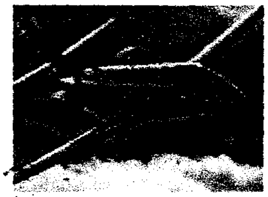
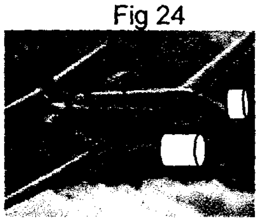


Fig 23

Fig 24

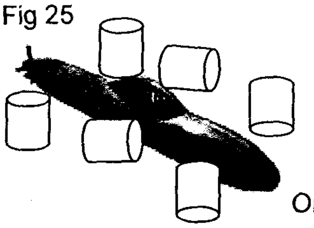


Modified Cessna

Minimum thrust must be twice the maximum takeoff weight for vertical takeoff and landing with the option of tradition landings.

After lift off the engines a rotated horizontally and operates as a standard aircraft and emergencies using wings for lift with rudders and ailerons for control with the added benefit of the engines steering in the desired direction. Low density air at high altitude reduces wing control but rotating engines elevate the need for air jet reaction control system (Fig 66)

Fig 25



Or tractor "trailers" (Fig 26-27) a VTOS or MVTOS

By adding MVTOS to various cargos one

FIG 26

FIG 27

Like these trains containers

Thrust operating independently a MVTOS on a sub (Fig 25) to point the body straight down for a dynamic maneuver

The Luna module (Fig 30) also has fixed thrusters that could easily "rotate in any direction" to execute a maneuver. The space shuttle with a MVTOS has control in atmosphere the transition (Fig 36) and space (Fig 35) for VTOL air flight re- entry (Fig 33) satellite repairs and docking (Fig 34).

Fig 28

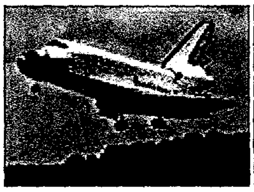


Fig 29

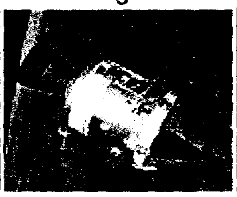


Fig 30

Fig 31

Fig 32

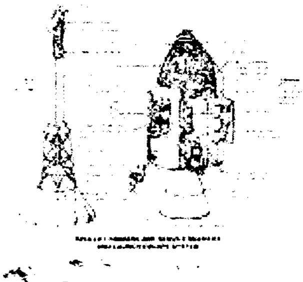
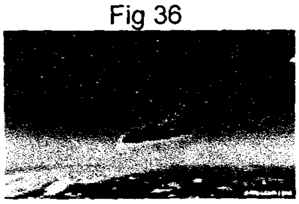


Fig 33

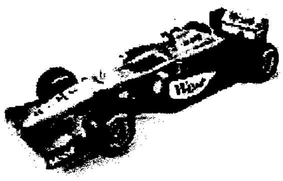
Fig 34

Fig 35

Fig 36



Race car (Fig 37) spoilers for lift at the front and rear. Rudder and ailerons can be located in the rear for normal aircraft control once in full forward flight for a skycar type vehicle or emergencies.
FIG 37

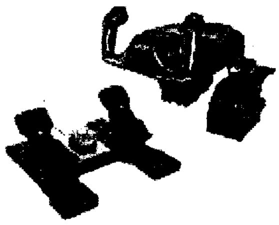


Inverting a race cars down force to lift makes an excellent vehicle to mount engine pods to the **A2FLT (Fig 16) or A2FDS (Fig 8)**.

Controls

1 steering wheel (left right) (Fig38) thrust angle lever (forward back up down) hand and foot throttle (fast slow up down)

FIG 38

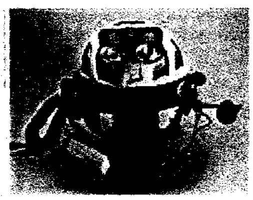


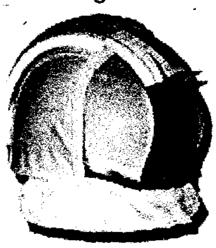
2 joy stick(left right forward back up down pitch) hand throttle (fast slow up down)

FIG 39

Multi-Vectored Thrust Operating System with two hand multi function "joysticks" (Fig39) direct thrust and the pitch of the body for dynamic control.

Fig 40 Fig 41 Fig 42 Fig 43

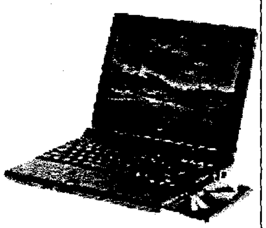





Hands free operation of the MVTOS using the latest helmet systems (Fig 40-43)

FIG 44

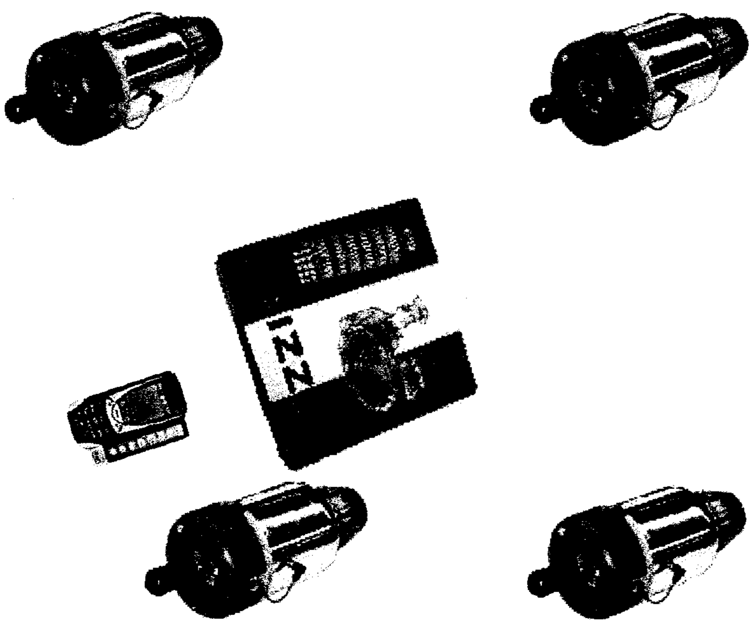
FIG 45



A basic 3 channel controller (Fig 44) and pc (Fig 45)

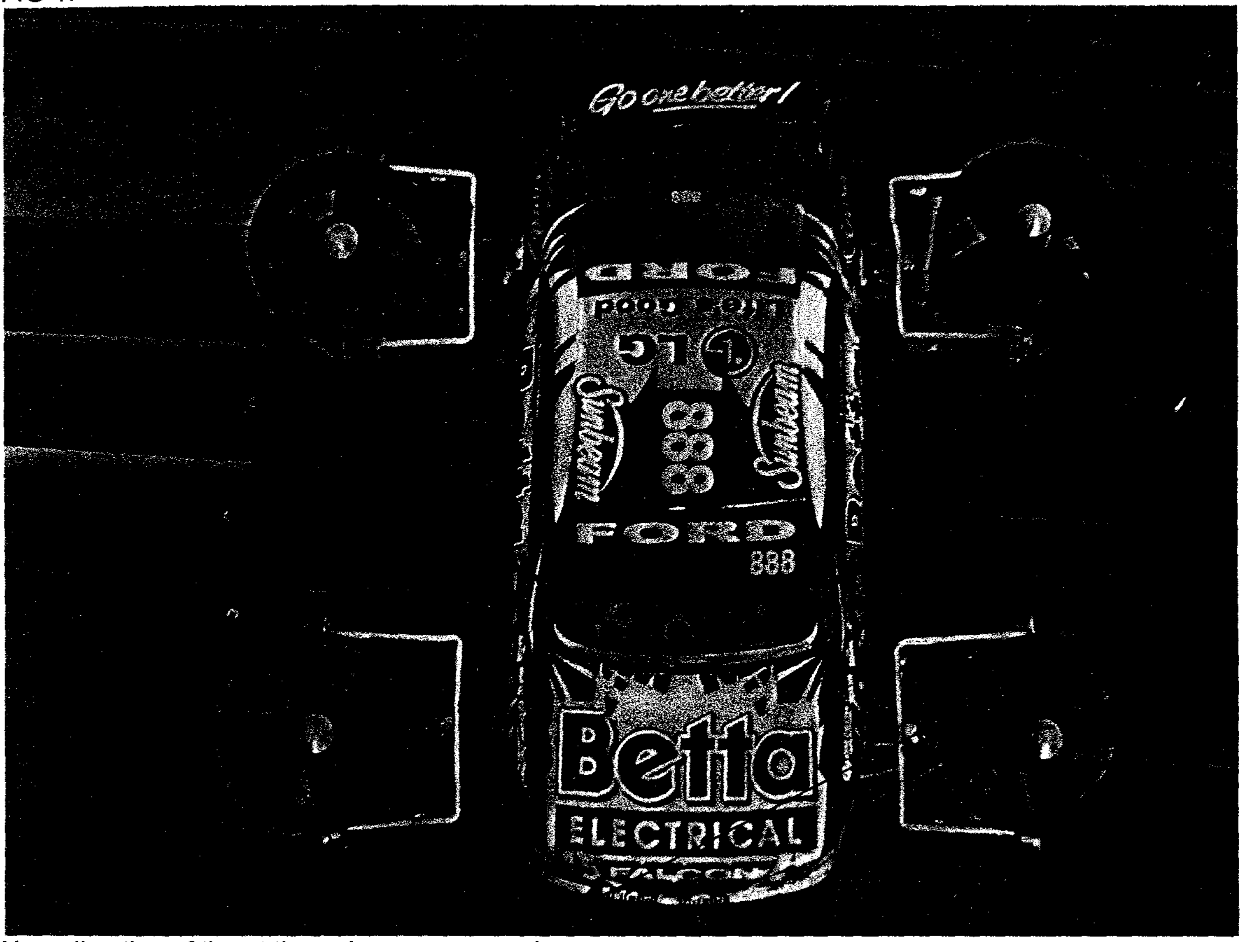
3 remote control (Unmanned vehicles) (Fig 46)

FIG 46



A satellite navigation system camera or humble mobile directs the cargo to is destination and onboard camera allows for tricky maneuvers (Fig 46) via pc (Fig 45) or remote control (Fig 44). Military drones, spy cameras pizza etc

FIG 47



No redirection of thrust through vanes or nozzles

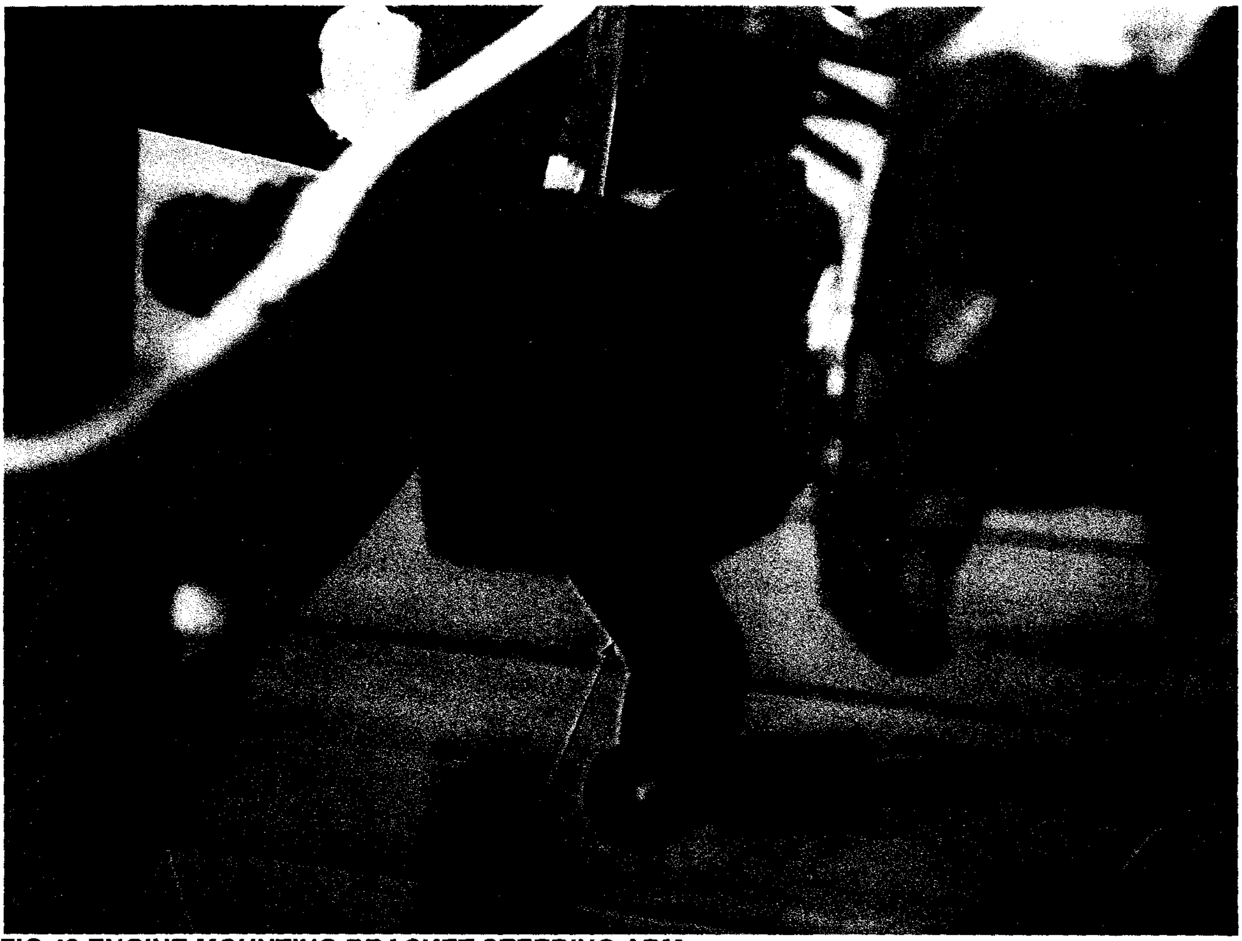


FIG 48 ENGINE MOUNTING BRACKET STEERING ARM

Aluminum ladder frame Bush lift points

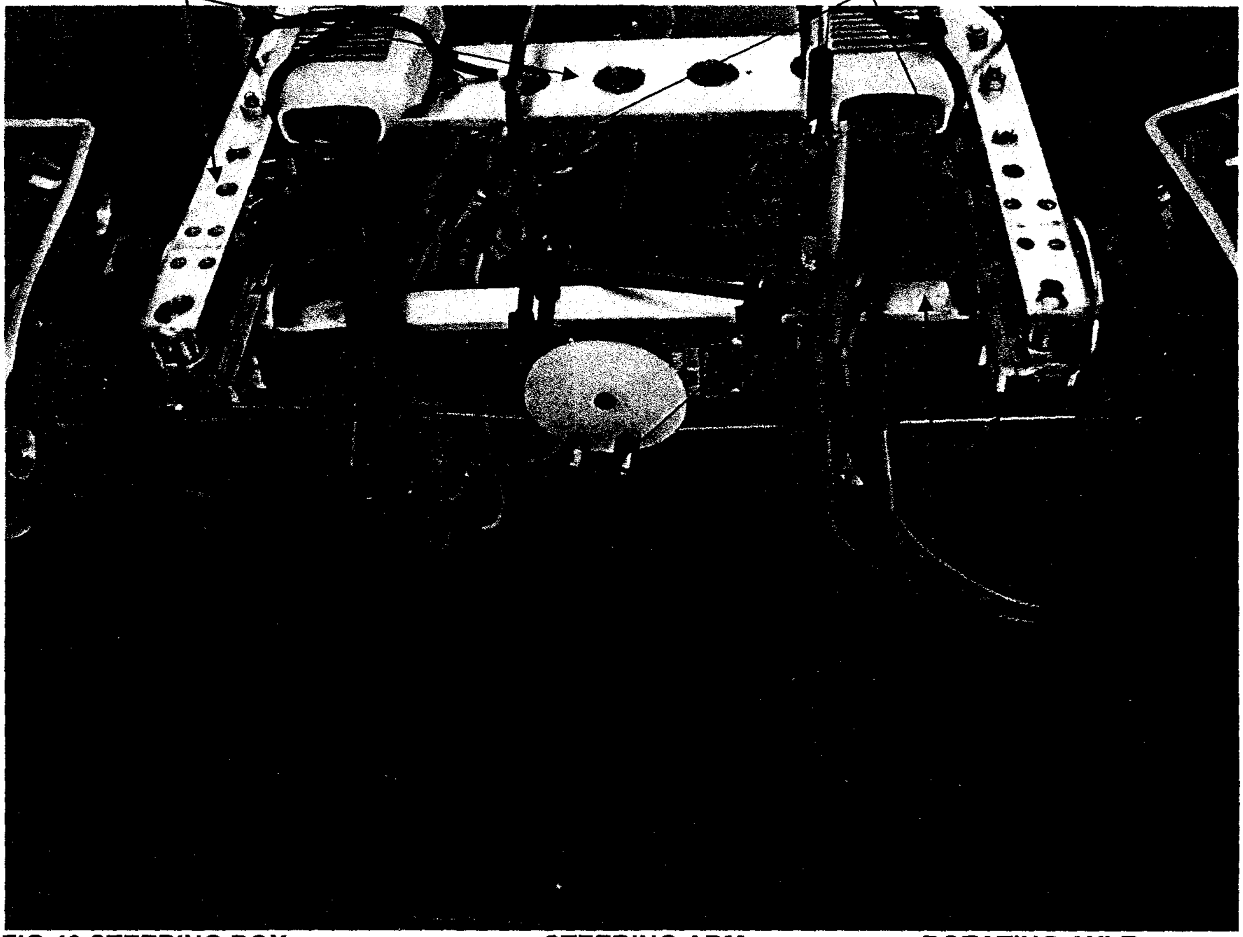


FIG 49 STEERING BOX STEERING ARM ROTATING AXLE

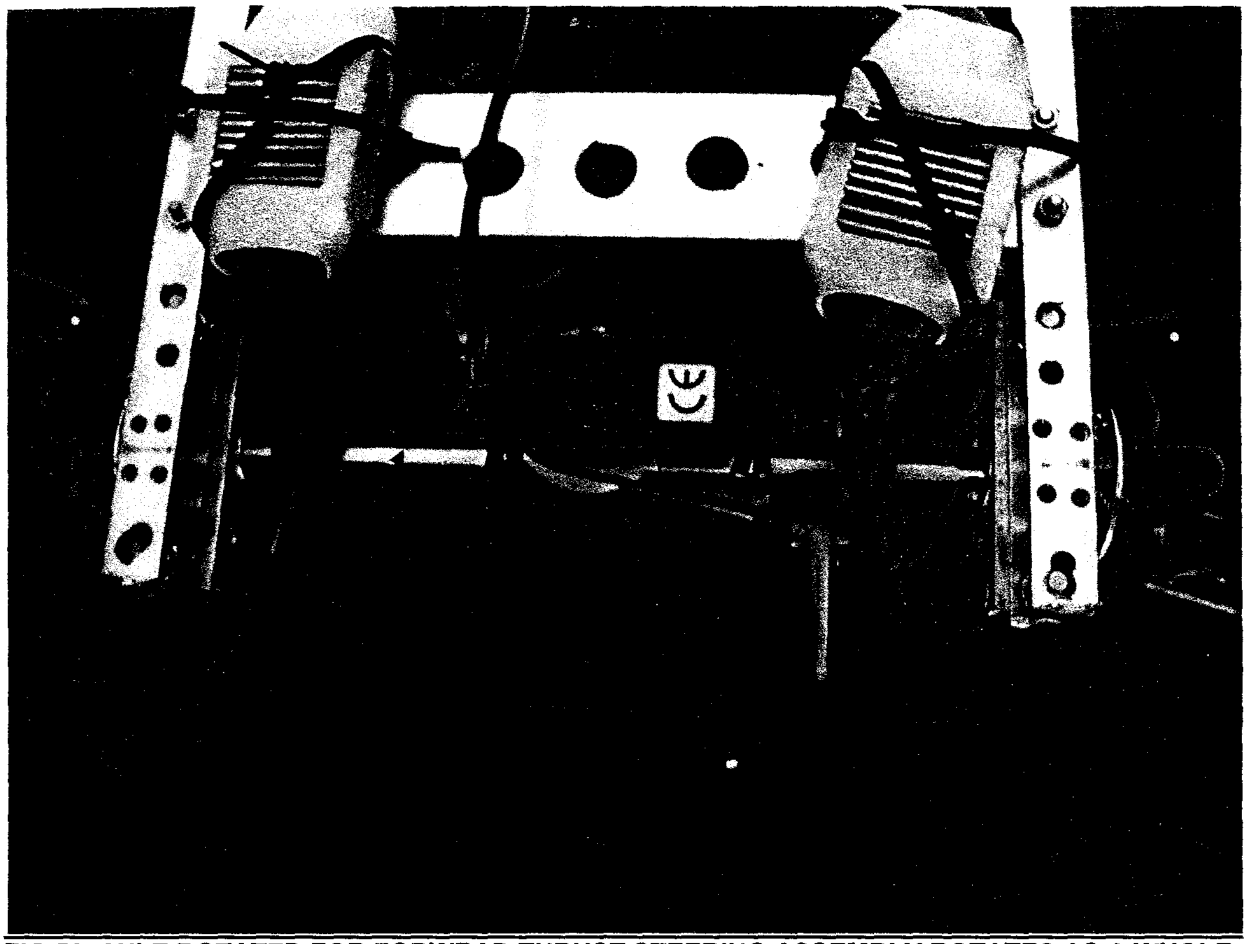


FIG 50 AXLE ROTATED FOR FORWRAD THRUST STEERING ASSEMBLY ROTATES AS A WHOLE

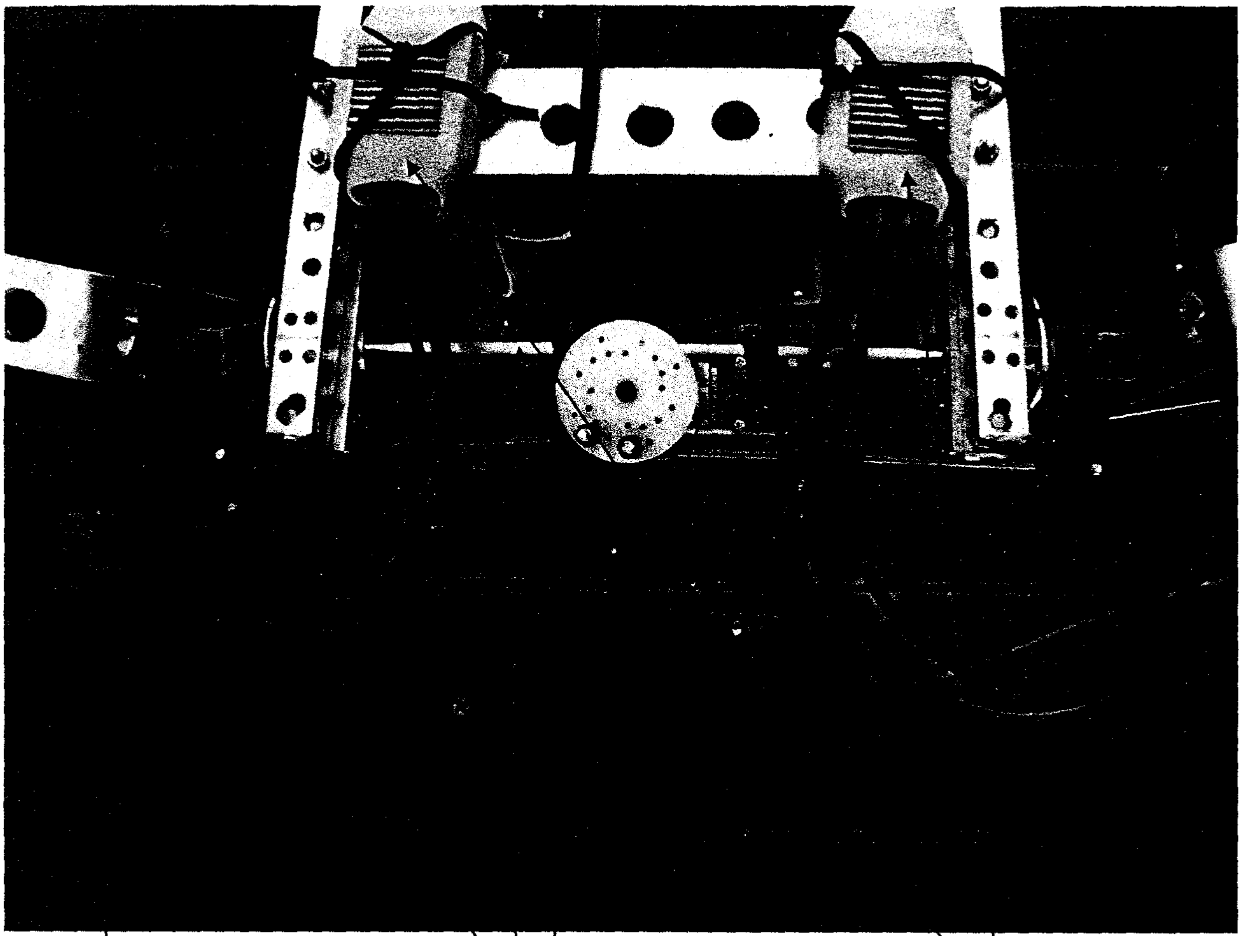


FIG 51 REVERSE THRUST. WHOLE AXLE STEERING ASSEMBLY IN REVERSE. ENGINE SPEED CONTROLLER

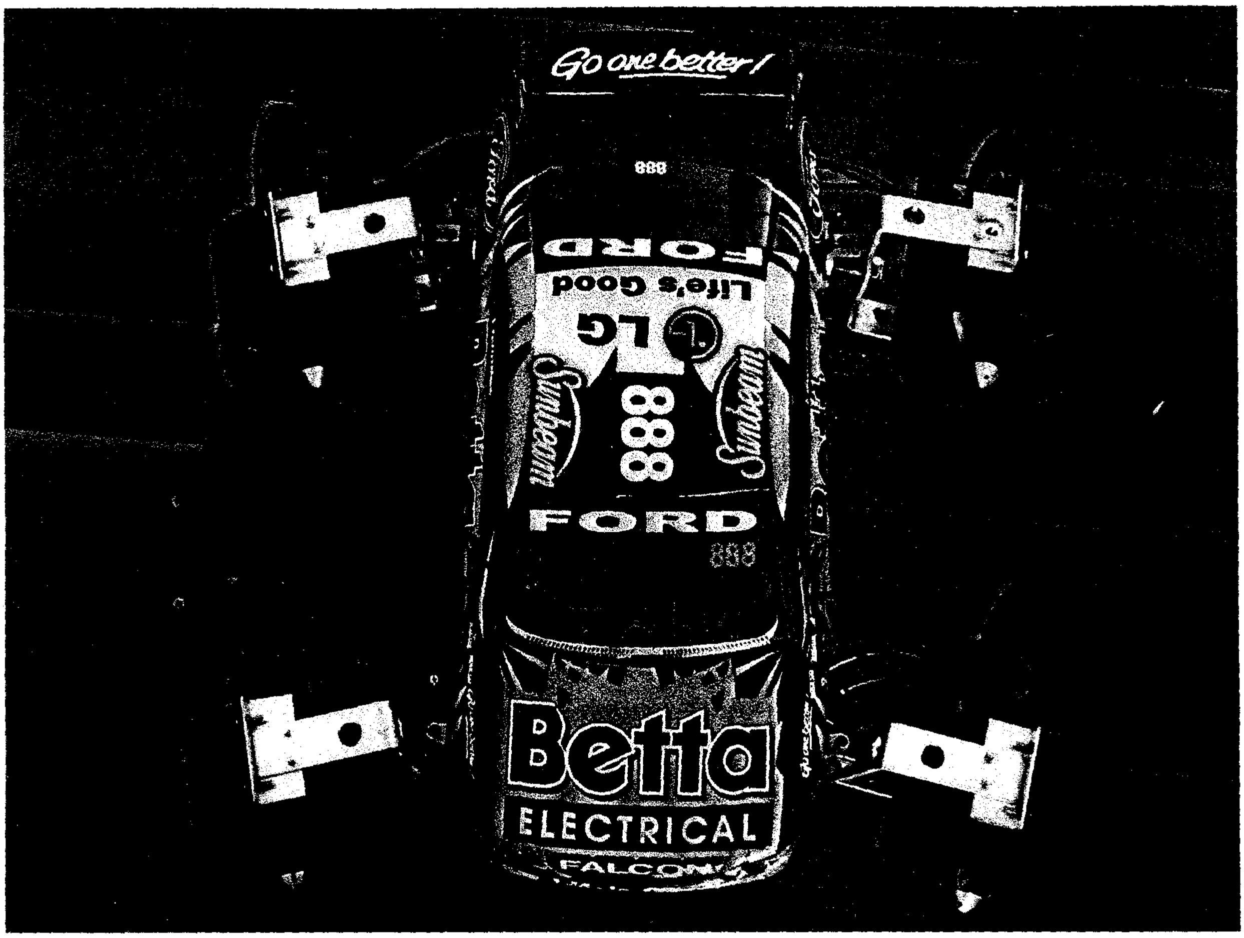


FIG 52 ENGINE PODS FORWARD

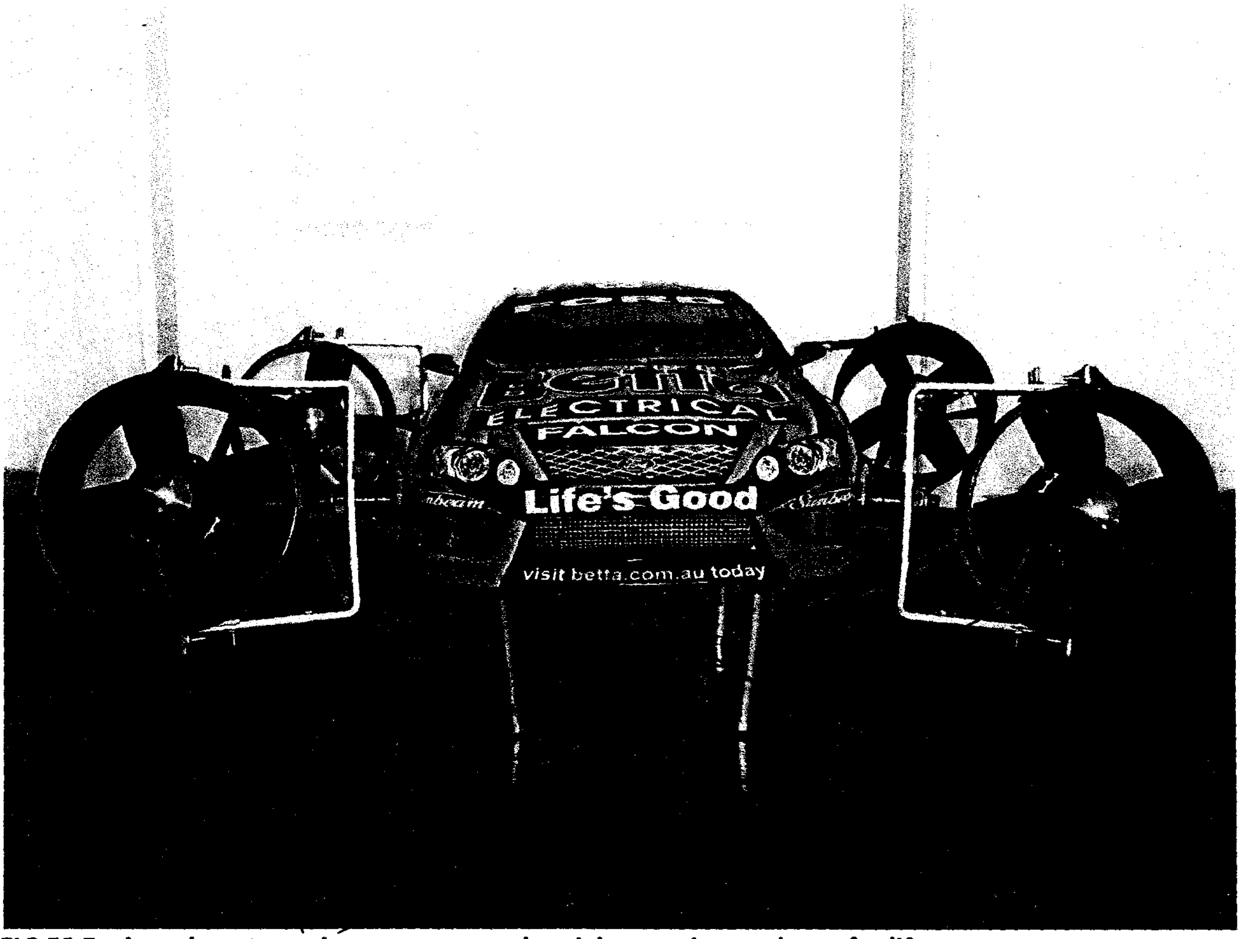


FIG 53 Engines do not require vanes or nozzles giving maximum thrust for lift

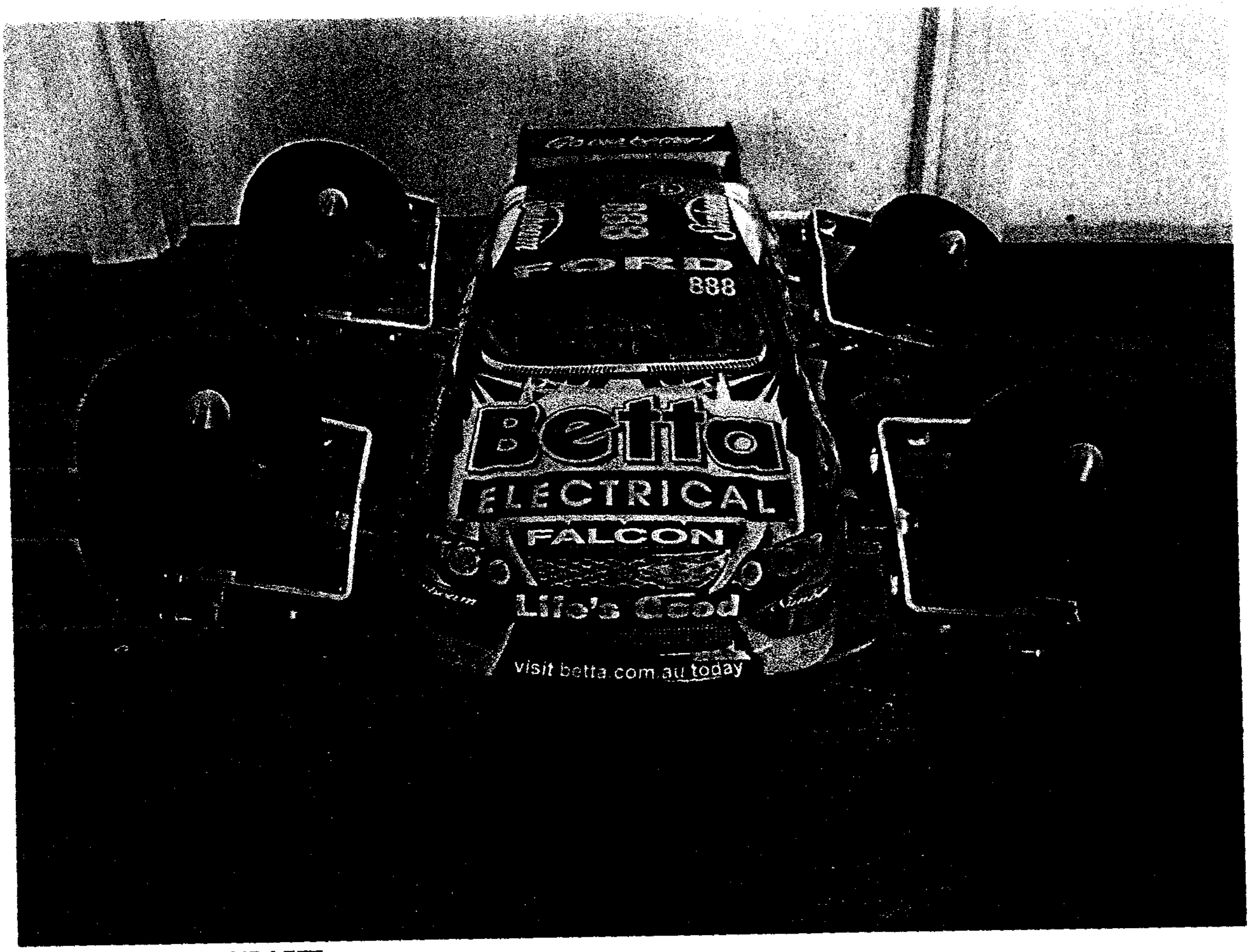


FIG 54 TURNING UP LEFT

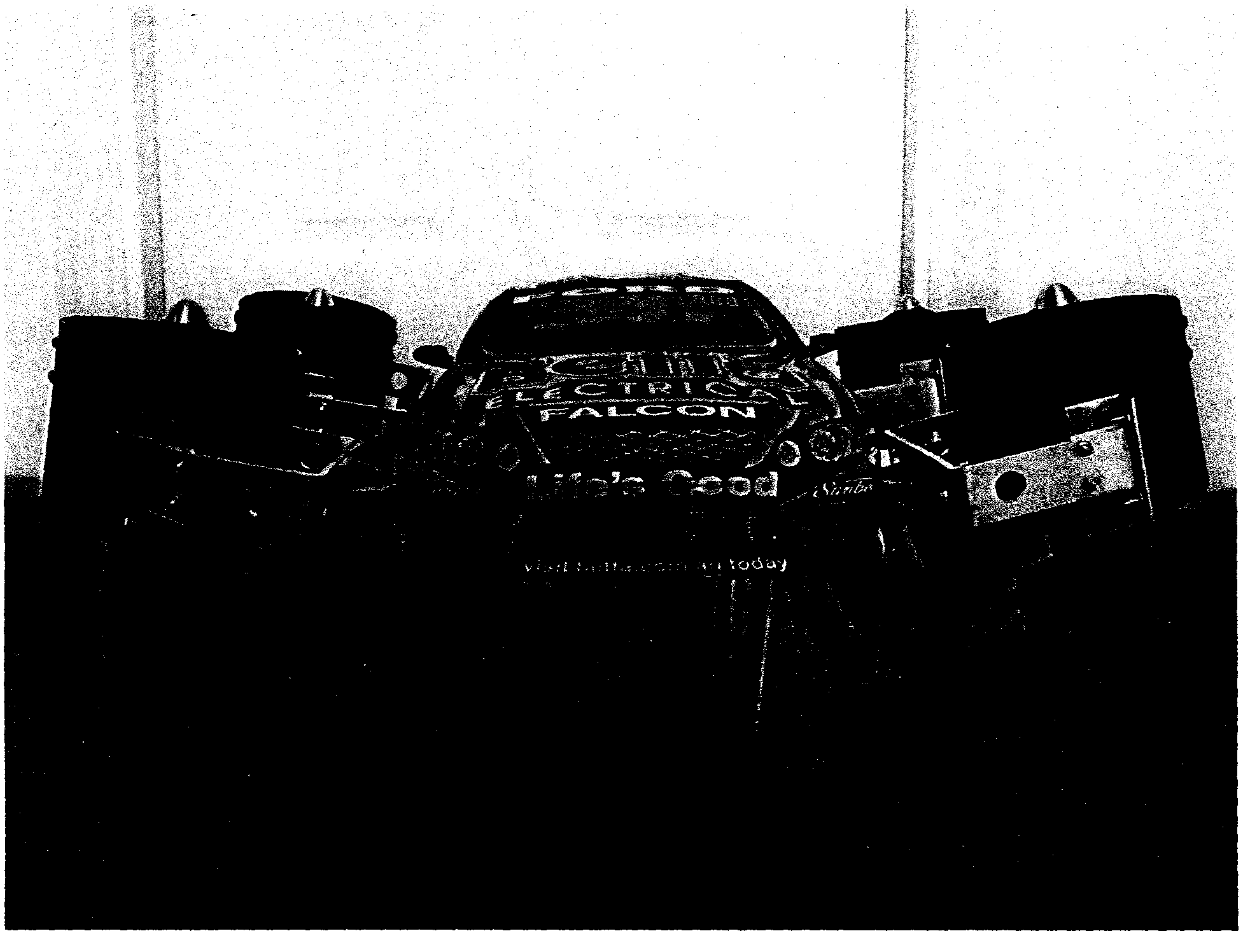
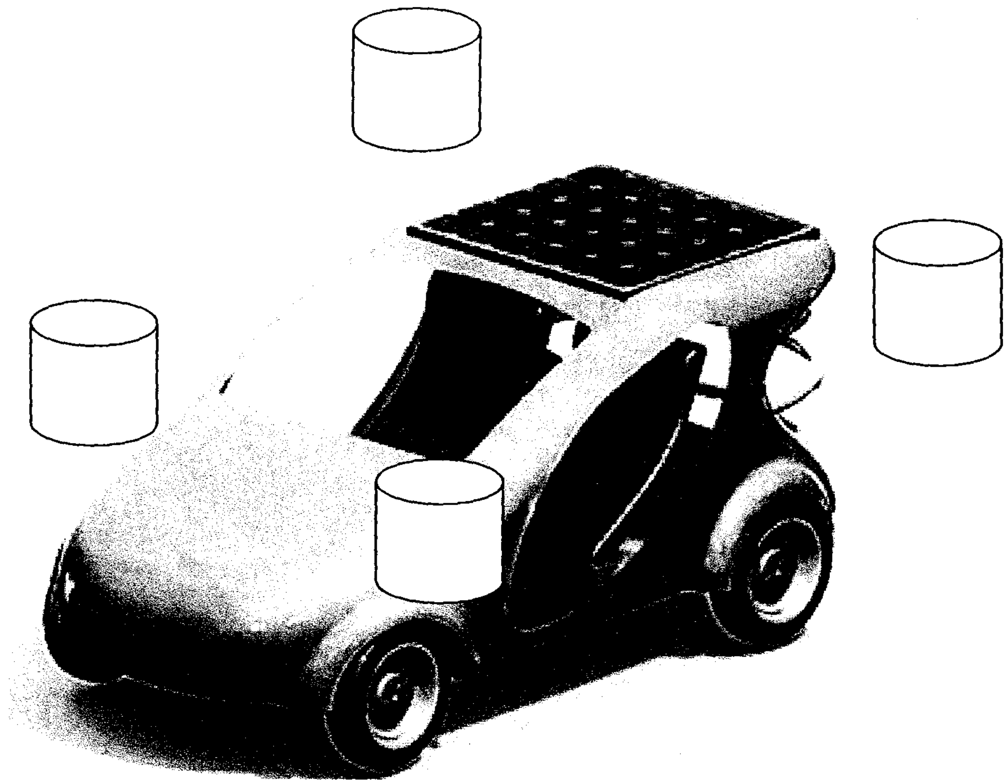


FIG 55 READY FOR vertical TAKE OFF

FIG 56 electric sky car using NASA's electric motor.



Magnetically Levitated Ducted Fan Being Developed as a Propulsor Option for Electric Flight by NASA

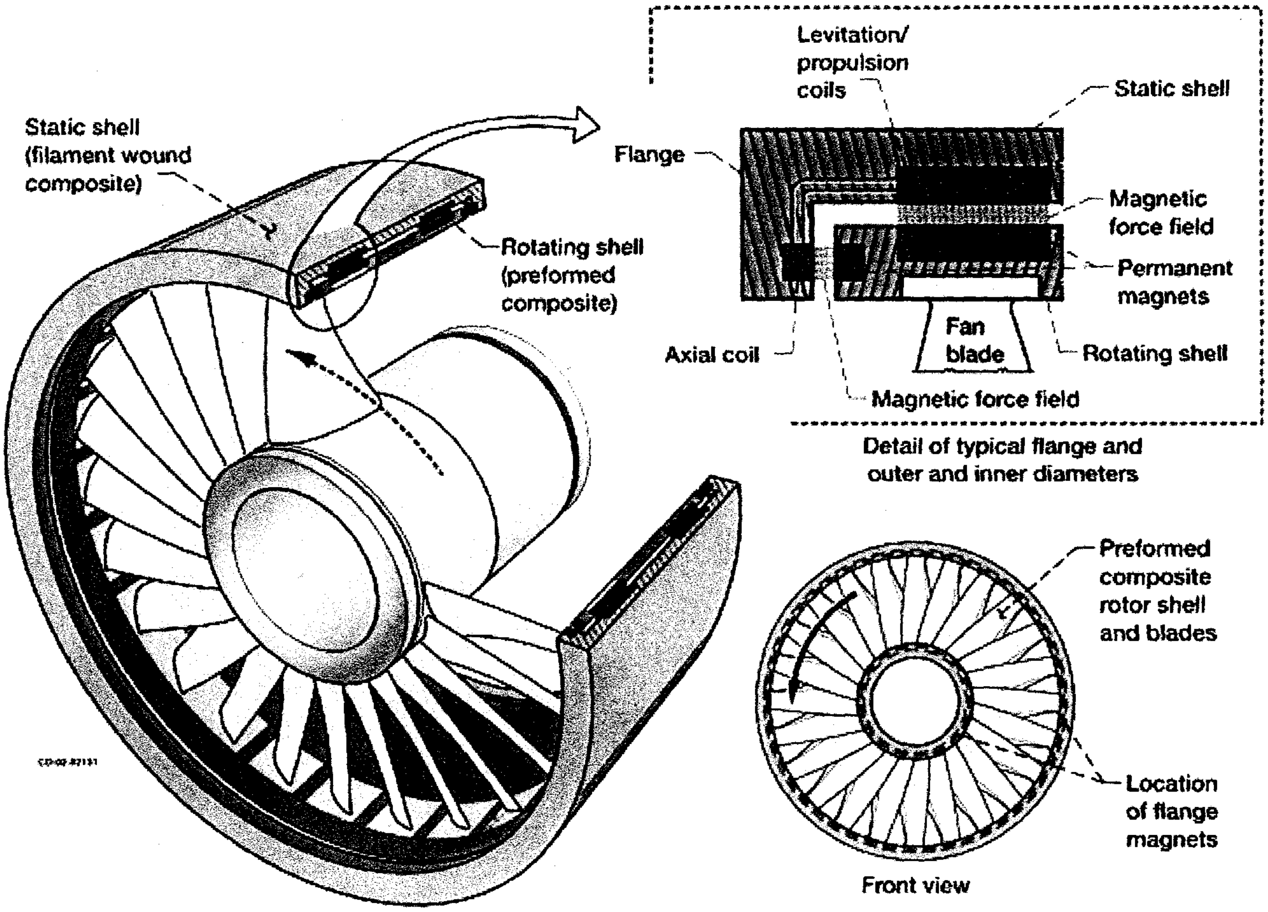
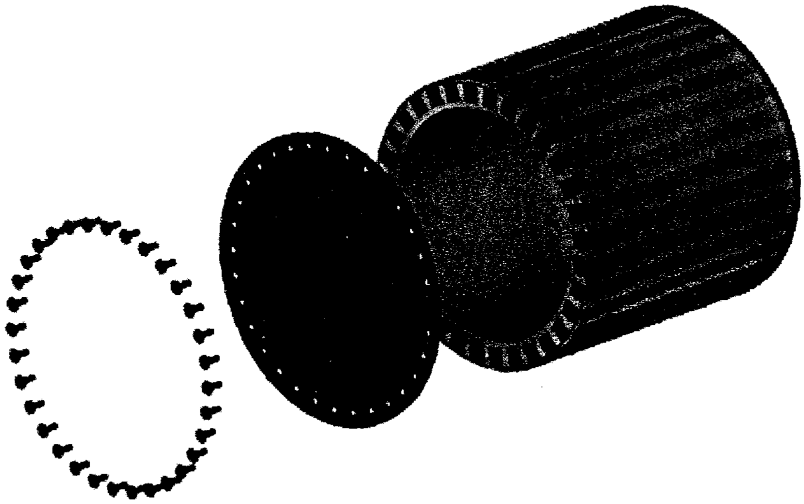
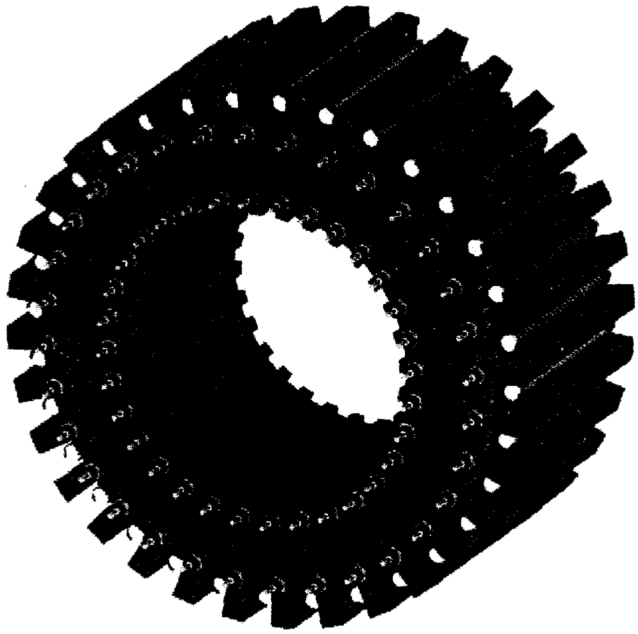


Fig 57



Small-scale levitation model rotor. Fig 58



Small-scale levitation

model stator. Fig 59

Glenn contact: Dawn C. Emerson, 216-433-8901, **Dawn.C.Emerson@nasa.gov**
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Programs/Projects: RAC

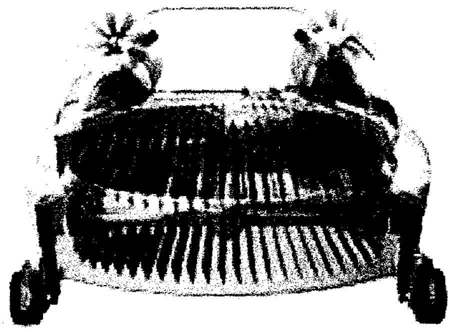

Fig 60
Vane Control System (U.S. Patent #6,464,166)

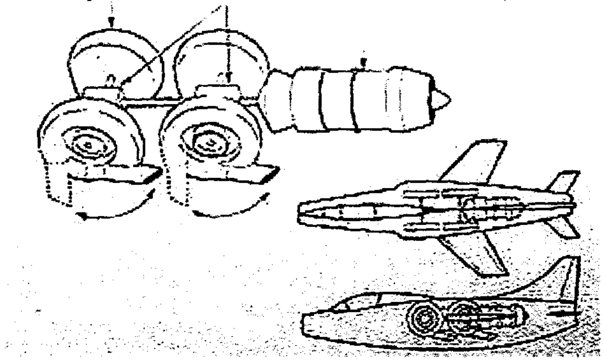

Fig 61 Origins of thrust vectoring

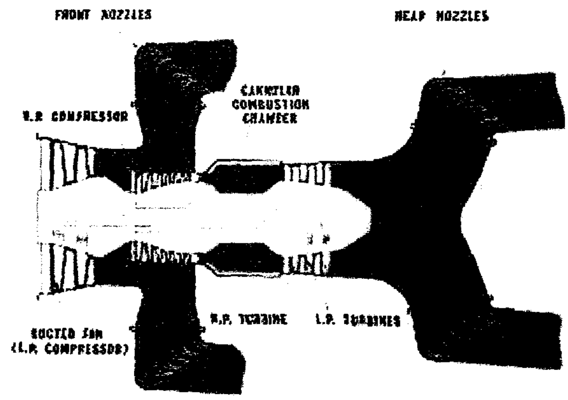

Fig 63 Engine gas flow

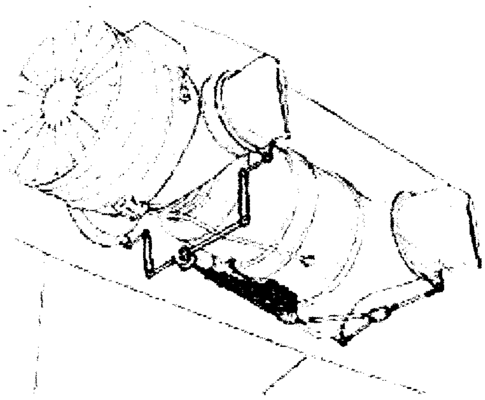

Fig.64 Nozzle actuation system

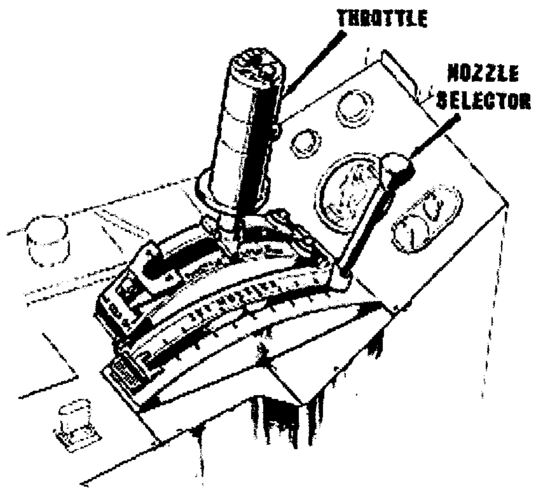

Fig. 65 Nozzle selector lever

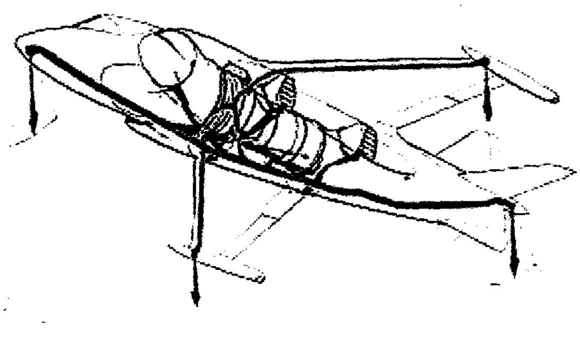

Fig.66 Initial reaction control system

Attitude control in the hover was by a **jet reaction control system** (fig.66).

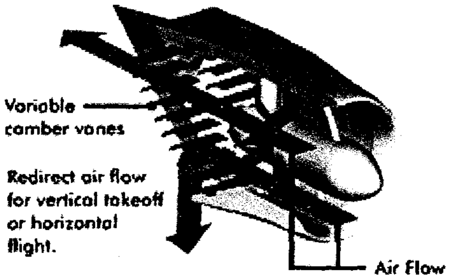

Fig 67

Fig 68

Inventors:	**Moller; Paul S.** (Dixon, CA)
Assignee:	**Moller International, Inc.** (Davis, CA)
Appl. No.:	**07/472,696**