(19) DANMARK

(10) **DK 179141 B1**

(12) PATENTSKRIFT

Patent- og Varemærkestyrelsen

(51) Int.Cl.: ***F 03 G 3/00 (2006.01)*** *H 02 K 53/00 (2006.01)*

(21) Ansøgningsnummer: **PA 2015 00472**

(22) Indleveringsdato: **2015-08-14**

(24) Løbedag: **2015-08-14**

(41) Alm. tilgængelig: **2017-02-15**

(45) Patentets meddelelse bkg. den: **2017-12-04**

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(54) Benævnelse: **Elektromagnetisk puls - stempel fremdrift system**

(56) Fremdragne publikationer:
WO 02/06120 A1
US 5685196 A1
DE 202009010399 U1
US 5036930 A1
US 4801111 A1
US 4674583 A1
US 2010/0244590 A1

(57) Sammendrag:
The Electromagnetic Pulse - Piston Propulsion System (EMP-PPS) is a hybrid design based on the combustion and electromagnetic engines. EMP-PPS utilizes the advantages and can substitute both. The closed electric EMP-PPS needs no external gas input or exhaust system and is enabled for space. Sizes and combinations of several EMP-PPS units apply for any electric vehicle (EV) and can support auxiliary devices like wheels, drills, generators and propellers. Computerized EMP-PPS can support EV for advanced maneuvers, operations, computing and telecom. The figure shows a basic EMP-PPS engine unit were the electromagnet (EM) (A) makes EMP, forces Piston´s permanent magnet (PM) (B) and EM (A) in opposite directions. Bumper (D) reduces reactive force (F) and Springcoil (C) returns (B). (B) enables Switch (E) for another electric pulse from Regulator (I) that is powered by Battery (H) and Power-source (J). The EMP-PPS forward thrust equals the reduced reactive force of (B).

Fortsættes ...

Figure 1

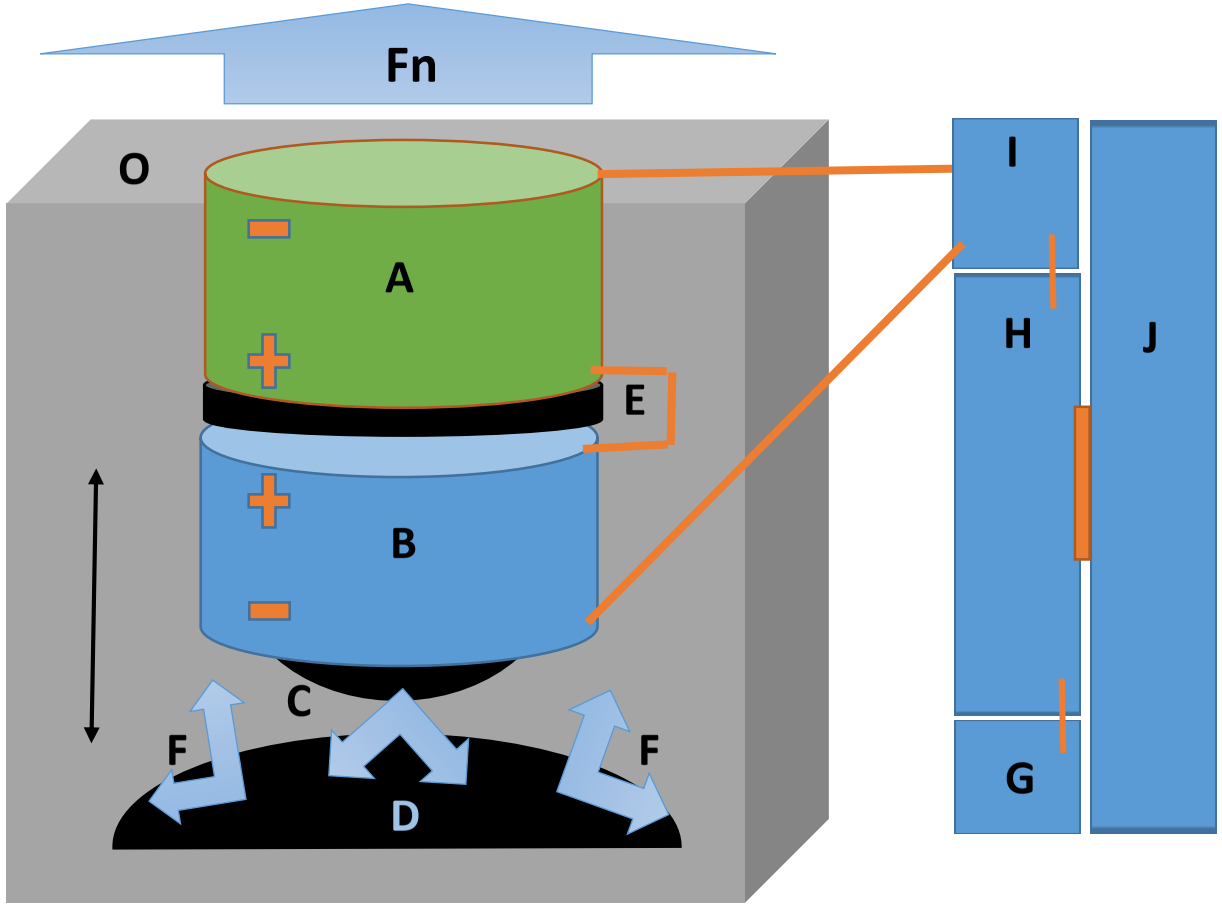

Fig 1a

Fig 1b

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DESCRIPTION OF THE INVENTION; THE ELECTROMAGNETIC PULSE - PISTON PROPULSION SYSTEM (EMP-PPS)

The Electromagnetic Pulse - Piston Propulsion System (EMP-PPS) is a hybrid engine system based on the principles of the combustion engines and electromagnetic engines. The EMP-PPS can substitute both, utilizes their advantages and provide new opportunities and solutions. The EMP-PPS applies to any kind of Electric Vehicles (EV) like, automobiles, railway trains and watercrafts

A single EMP-PPS engine unit is also called an 'EMP engine'.

A main difference between the combustion engine and the EMP engine is that the EMP Piston is utilized to minimize, not maximize, the backwards reactive force in order to maximize the net forward thrust to the bearing construction of the electric vehicle. Furthermore, the EMP-PPS can be airtight and requires no external gas input or exhaust system. However, the EMP-PPS requires electric energy sources from batteries, generators and/or converted energy, for example from external solar power.

The operation time, without re-charging, is relatively long for EMP-PPS. It has, in theory, minor limits for power supply, distance, speed, maneuverability or lifecycle. The EMP-PPS has indefinitely operational time in the inner solar system, when continually solar powered. The surplus solar energy is temporarily stored in the batteries for later use. An EMP-PPS based EV with powerful energy sources can provide power to auxiliary devices like wheels, drills, pumps, generators and propellers, - in addition to providing energy to internal and external electric equipment and devices like sensors, monitors, telecom, computers, gyroscope, GPS and other apparatuses.

Sizes and combinations of several EMP-PPS engine units makes an EV relatively advantageous, beneficial and maneuverable compared to other known space propulsion systems. An EMP-PPS can be of several sizes, powers and combinations of units and modules, to suit numerous tasks in various kinds of environments. The magnets used as EMP engines can be of various sizes and powers. For example, a commercial permanent magnet (PM) of size 40x40x20 mm can lift, push or pull 60 Kg. The smallest electromagnet (EM) weight less than a gram. A large EM can lift tons and the largest EM is in the LHC (Large Hadron Collider) in Cern. Therefore, in theory, an EMP-PPS can be of any practical sizes. It might even be possible to design a micro EMP-PPS for surgery support. Medium EMP-PPS are for most common use for Electric Vehicles (EV) like submarines, ships, trains and cars. Large EMP-PPS can provide additional thrust for larger constructions at sea. The EMP-PPS can also work on a low-gravity EV cars and provide additional EMP trust to overcome barriers.

An EMP-PPS computerized control module will provide optimized and advanced solutions for all the EMP-PPS units and modules together. A computer can also provide computing capacities for advanced operations, exploration, communication, remote control, auxiliary thrust etc.

Uniqueness according to known sources about propulsion

The EMP-PPS does differ from the prior art essentially, and do present new, useful, and non-obvious solutions to well-known scientific challenges.

The EMP-PP system utilizes Newton's three laws of motions to overcome the assumed barriers of conservation and momentum and consequently provide thrust in any required direction. The EMP-PPS is therefore unique and beyond common knowledge. No known person skilled in the art of magnetic has been able to solve the challenges like the EMP-PPS does.

Discussion of differences to the closest Prior Art

The Danish Patent and Trademark Office (Patent- og Varemærkestyrelsen) informs that there are 4 Prior arts that also uses EMP for propulsion. These are:

- (D1) WO 02/06120 A1 (DANIEL MAURICE) 2002-01-24
- (D2) DE 202009010399 U1 (YALCIN MAMUK) 2009-12-24
- (D3) US 5036930 A1 (BISEL et al.) 1991-08-06
- (D4) 4801111 A1 (ROGERS et al.) 1989-01-31

Still, none of the listed prior arts utilize a Piston to reduce the reactive force in order to utilize the forwards/upwards-directed electronic magnet to provide the net force for forwards/upwards propulsion inside a completely sealed electric vehicle (EV).

For example, the D1 is considered to be the closest prior art to the EMP-PPS invention. Still, a person skilled in the art of electromagnetic pulse propulsion, who would like to solve the mentioned challenges, could not be inspired by his common, specialist or other specific knowledge within the field in order to suggest the solution mentioned in claim 1 of the EMP-PPS invention. The reasoning is as follows:

D1 describes a propulsion system comprising a basic engine unit (10, 24, 52), a controller (42, 64) and a power source (such as batteries and/or solar cells): wherein the basic engine unit (10, 24, 52) comprises;

- a container (26) comprising a first end and a second end, wherein the first end and the second end are located at opposite ends of the container along its axial direction;
- a forward directed first electromagnet (within a projector) that is mounted inside the container at its first end, wherein the first electromagnet is configured to be mounted to a bearing construction of an electric vehicle, and wherein the first electromagnet generates a first electromagnetic pulse in order to provide a forward thrust;
- a solid weight located inside the container, wherein the solid weight e.g. comprises a magnetic component (e.ge. ferromagnetic material), and wherein the solid weight is pushed from the electromagnet towards the second end of the cylindrical container in response to the magnetic pulse generated by the first electromagnet;
- a switch that is connected to the power source, wherein the switch triggers the first electromagnet to generate another electromagnetic pulse and thus starts providing another forward thrust to the first electromagnet and another cycle of the solid weight's movement.
- in an embodiment, the propulsion system comprises a damping component (absorbing component 128) which brings a bearing ball in to rest before it returns to a ball bearing reservoir.

Still, the subject matter of the EMP-PPS claim 1 differs from D1 in that the electromagnetic pulse – piston propulsion system (EMP-PPS) comprises a damping component located at the second end of the cylindrical container, wherein the damping element reduces at least a portion of the reactive kinetic energy from the piston by absorbing, redirecting and converting the kinetic energy into another form of energy; and the reduced kinetic energy of the piston results in a net displacement of the EMP-PPS that results in a forward directed thrust to the first electromagnet, the bearing construction and the electric vehicle.

The problem addressed by the subject matter of the EMP-PPS claim 1 may is: how to minimize the backwards reactive force in order to maximize the net forward thrust to the bearing construction of the electric vehicle.

The subject matter of claim 1, and the dependent claims, is therefore both new and differs essentially from the prior art. Consequently, the EMP-PPS should be patentable.

General sources of Prior Art

Furthermore, by other known sources, there is no solution like the EMP-PPS. In Espacenet Patent search, there are less than 20 patents for electromagnetic propulsion where none matches these EMP-PPS.

http://worldwide.espacenet.com/searchResults?submitted=true&locale=en_EP&DB=EPODOC&ST=singleline&query=electromagnetic+pulse+propulsion

Moreover, the Wikipedia article "Electrically powered spacecraft propulsion" lists three types ion and plasma drives; electrostatic, electrothermal and electromagnetic, and 3 types non-ion drive; photonic, electrodynamic tether and unconventional. None of them utilizes EMP.
https://en.wikipedia.org/wiki/Electrically_powered_spacecraft_propulsion

However, Wikipedia do mention EMP for orbiting satellites with quite different solutions than the EMP-PPS. "One of such applications is the use of EMP to control fine adjustments of orbiting satellites. One of these particular systems is based on the direct interactions of the vehicle's own electromagnetic field and the magnetic field of the Earth. The thrust force may be thought of as an electrodynamic force of interaction of the electric current inside its conductors with the applied natural field of the Earth. To attain a greater force of interaction, the magnetic field must be propagated further from the flight craft. The advantages of such systems are the very precise and instantaneous control over the thrust force. In addition, the expected electrical efficiencies are far greater than those of current chemical rockets that attain propulsion through the intermediate use of heat; this results in low efficiencies and large amounts of gaseous pollutants. The electrical energy in the coil of the EMP system is translated to potential and kinetic energy through direct energy conversion. This results in the system having the same high efficiencies as other electrical machines while excluding the ejection of any substance into the environment."
https://en.wikipedia.org/wiki/Electromagnetic_propulsion#Spacecraft

In conclusion, based on the General sources of Prior Art too, the EMP-PPS is unique, beyond common knowledge and no known person skilled in the art of magnetic has been able to solve the relevant challenges. Therefore, the EMP-PPS is new, useful, and non-obvious and consequently should qualify as patentable.

Links about NASA EM drive testing:

http://illvit.no/universet/romfart/emdrive-virker-ifolge-lekket-nasa-dokument
https://www.nasaspaceflight.com/2015/04/evaluating-nasas-futuristic-em-drive/

Summary description of the EMP-PPS units and modules

The Electromagnetic Pulse – Piston Propulsion System (EMP-PPS) can consist of one or more engine units and supporting modules that together provide the system with propulsion and other required purposes. There are 7 patent Claims with 11 Descriptions and 9 Figures.

Firstly, there are three versions of EMP-PPS (engine) units with different qualities. Generally, the EMP-PPS units consist of; a Cylinder container with forward directed electromagnet (EMf), mounted inside the top Cylinder head, producing the EMP and forward active force; a Piston, with a second reactive electro- or permanent magnet (EMr), connected to the EMf electrical circuit that provides simultaneously a EMP of same polarity, which pushes the Piston with the reactive backwards force. A damping device at the bottom of the Cylinder reduces the reactive force from the Piston by absorbing, redirecting or converting the reactive kinetic energy. A ricocheting device returns the piston and an electric sensor trigger a new pulse that repeats the cycle of thrusting pulses. The EMf, which is mounted to the 'top Cylinder head' and directly to the bearing construction of the electric vehicle (EV), transfer the net forward force from the EMP to a forward thrust for the EV. The net forward thrust equals the active forward force minus the reduced reactive force (Fn = Ff - Fr).

The three Claims of versions of EMP-PPS (engines) units are: The '1. Basic engine unit' that redirects, converts and absorbs the reactive kinetic energy by a Bumper and/or a Springcoil. The '2. Motor unit' that is an EMP version of the traditional combustion engine that redirect the reactive kinetic energy to external devices. The '3. Induction unit' that converts some reactive kinetic energy to electric energy. In addition, there is the '4. Parallel EMP system' that consists of multiple basic engine units that are mounted in parallel in order to multiply the forward thrust to the electric vehicle.

Energy from an electric vehicle battery (EVB) (figures 7) is required for any battery driven electric vehicles (BEV) (figures 9). Lithium-ion (and similar lithium polymer) batteries are recommended. However, the preferred electric energy sources for EMP-PPS is solar power by modified standard kits with solar panels, batteries and controller units. Alternatively, generators like an RTG (radioisotope thermoelectric Generator) can provide the required energy. The EMP-PPS also require additional electrical devices like AC/DC converter, electric switches, auto-fuses, sensors and monitors.

An advanced EMP-PPS requires a computerized controller module (figures 8) to control the EMP frequencies, altitudes and waveforms, in addition to control related sensor, monitors and triggers. The Controller module can activate and synchronize multiple EMP-PPS engine units for desired and required maneuvering of the EMP-PPS driven electric vehicle (EV). The module can also control environmental sensors and trigger actions for other electronic devices in the EV, - like controls for heat, pressure, voltage, and speed. The Controller module can also provide opportunities to numerous new features for the EMP-PPS for better adjustments, tunings, operations, navigations and maneuvering. Furthermore, the computer can provide several general uses for the EV like information collection and storage, communication, interoperability, programming routes, maneuvering and remote control by telecom, react to obstacles etc. The Raspberry Pi 2 Model B

computer with Windows 10 IoT operating system is recommended, although different kinds of CPU and OS are usable. However, more robust and simpler computer might be required for harsh environments like in space.

Claim 4 describes how several EMP-PP engines can be mounted in parallel to provide multiple thrusting force. Claim 5 tells how 6 EMP-PP engines can be arranged to provide movement for the EMP-PP system in the XYZ-axis of the Cartesian coordinate system.

Figure 9 shows EMP-PPS for several kinds of electrical vehicles like in water and at land, such as watercrafts, railway trains and automobiles.

See the related Patent Claims 1-7 and Figures 1-9 to these Descriptions 1-11.

1. The Basic Engine unit

The EMP-PPS Basic engine unit refers to claim 1 and is characterized by an electromagnetic pulses (EMP), created by the forward electro magnet (EMf) mounted in a cylinder that is mounted to the electrical vehicle's (EV) bearing construction; and the reactive magnet (EMr) of same polarity, mounted on the top of the moving Piston. The EMP causes an active force (forward thrust) to the EMf and the Cylinder head and the EV's bearing construction. The backwards reactive force to the Piston is deliberately reduced by absorbing, redirecting and/or converting some of the reactive kinetic energy; in order to increase the net forward thrust. The EMP-PPS utilization of the process is in contrast to the intention of a combustion engine, where the kinetic energy is maximized and not minimized. A dampening device at the Cylinder's bottom' reduces the Piston's reactive force and a 'Springcoil' and/or 'Bumper' returns the Piston towards the EMf once again. When close to the EMf, the returned Piston triggers a Switch at the electric circuit form the Power Module that generate a new EMP of same polarity by the EMf. The EMr that starts another cycle for the Piston.

Detailed descriptions to figure 1a, 1b and 1c:

Figure 1a. An electromagnetic pulse – piston propulsion system (EMP-PPS) comprising a basic engine unit (1a), supported with a controller and a power source (1b). Figure 1c shows an EMP-PP System of units and modules.

As shown in figures 1a, 1b and 1c, the EMP-PPS Basic engine unit comprises a cylinder containing the electromagnet (EMf) (1aA) mounted to the bearing construction of the electric vehicle (EV), the reactive electromagnet (EMr) on a Piston (1aB), a Springcoil (1aC) and/or Bumper (1aD), an electronic Sensor (1aE), and the cylinder's container (1aF). The supporting modules to the

EMP-PPS are (figure 1b) AC/DC converter (1bG), electric chargeable Battery/Accumulator (1bH), electric power and pulse Regulator (1bI) and external power sources (1bJ).

Detailed description to figure 1a:

O) A cylindrical container (1aO) comprising a first end and a second end; wherein the first end and second end are located at opposite ends of the cylindrical container along its axial direction.

A) The forward Electro Magnet (EMf) (1aA), in the front end of the cylindrical container (1aO), is directly mounted to the EV's bearing construction. The EMf (1aA) switches on and off electronically and thereby produces electromagnetic pulses (EMP) with same polarity as EMr (1aB). The EMP causes a forward force via the EMf to the bearing construction of the electric vehicle (EV). The sensor (1aE) triggers the EMP, where the Electric power and pulse Regulator (1bI) regulates the frequency, waveform and power to the EMP.

B) The Piston's electronic magnet (EMr) (1aB) has electrical connection to EMf (1aA) and produces a concurrently EMP with the same polarity as EMf. The EMP pushes the Piston (1aB) with the reactive force in opposite direction of the active EMf (1aA).

C) The dampening device (i.e. bumper) (1aC) is mounted at the bottom of the EMr (1aB) and hits the bumper at the cylinder end (1aD) and consequently returns the switched off Piston (1aB) towards the switched off EMf (1aA).

D) The EMr Bumper (1aC) redirects the reactive force (1aF) from the Piston (1aB) while the Cylinder Bumper (1aD) absorbs and converts some of the reactive kinetic energy; and some energy returns the Piston and the EMr (1aB) towards the EMf (1aA).

E) The elastic dampening device (i.e. a bumper) (1aD) container absorbs, converts and redistributes some of the reactive force (1aF) from the Piston's bumper (1aC). The Cylinder and its Bumper (1aD) consists of liquid or elastic molecules that spread and redirect the force (1aF) equally in all directions. The inside bottom surface is curved in order to spread the reactive force in any other direction than straight backwards. Some of the reactive energy (1aF) converts to heat, noise and other vibrations and thereby decrease the reactive force and increase the net forward thrust.

Figure 1b shows: AC/DC converter (1bG) (It is not in use for this EMP-PPS Basic unit.) Electric chargeable Battery/Accumulator (1bH). Electric power and pulse Regulator (1bI) for the EM (1aA) to generate EMP. External power source (i.e. generator, solar panel etc.) for the EMP-PPS that connects the Battery/Accumulator (1bH).

Figure 1c shows the exterior of a complete EMP-PPS engine unit. The top of the basic engine units is directly in touch with the bearing construction of the front of the EV' to provide the EV with a forward thrust.

2. The Motor unit

The EMP-PPS Motor unit refers to claim 2 and is based on the 'Basic engine unit' in claim 1, and is an EMP hybrid of the classic combustion engine. EMP-PPS Motor unit also includes a Connection rod (2aC) and a Crankshaft (2aD) that replace the ricocheting device in figure (1aC) and (1aD). The Connection rod (2aC) connects the Piston (2aB) the Crankshaft (2aD) that converts the Piston's kinetic energy to a rotating motion, which can be connected to external devices like; drills (2aE1), pumps (2aE2), wheels (2aE3), dynamos (2aE4) and propellers (2aE5) for physical work. Multiple EMP-PPS Motor units can be mounted like the V-engine design (2aF1) and have synchronized triggering order by a controller module (2aF2). This electric solution can be utilized in any ways the combusting engine does, but do not require input of gas or exhaustion systems. The EM do still provide for forward thrust in addition as described for the EMP-PPS Basic unit.

Detailed descriptions to figure 2a.

A) The Electro Magnet (EMf) (2aA) is switched on and off electronically and thereby produces electromagnetic pulses (EMP). The EMf (2aA) is pushed in forward direction and transfer its force to the EV (electronic vessel) as forward thrust.
B) The EMr can be electro- or permanent magnet mounted to the Piston (2aB). The EMr and EMf is triggered with the same polarity and therefor pushed from each other by the EMP.
C) A Connection rod (2aC) is mounted to The Piston (2aB) and transfers the reactive kinetic energy to the Crankshaft (2aD).
D) The Crankshaft (2aD) transfers the reactive kinetic energy a to rotation motion which can be utilize by external devices for physical work.
E) The Crankshaft (2aD) can be connected and operate external devices like; drills (2aE1), pumps (2aE2), wheels (2aE3), dynamos (2aE4) and propellers (2aE5).
F) Several EMP-PPS Motor units can be arranged like the combustion V-engine design (2aF1) and have synchronized triggering order (2aF2).

3. The Induction unit

The EMP-PPS Induction unit refers to claim 3 and is based on the 'Basic unit' in claim 1. It is characterized by an additional electromagnetic Induction coil and a moving permanent magnet (PMr) on the Piston that converts some of reactive kinetic energy to electric energy by the electromagnetic

induction in the coil. The electrical feedback functions like an energy recycle system. The inducted electricity is AC/DC converted (3bG) and returned to the Accumulator/Battery (3bH).

Detailed descriptions to figure 3a:

A) The Electro Magnet (EMf) (3aA) is shut on and off electronically and thereby produces electromagnetic pulses (EMP). The EMP is triggered by the sensor (3aE). The time, waveform and power is regulated by the electric power and pulse Regulator (3aI).

B) The permanent magnet (PMr) Piston (3aB) is pushed from EMf (3aA) by a reactive force due to same polarity. The magnet Piston (3aB) hits the ricocheting device (3aC) and/or a Bumper (3aD) that returns the Piston (3aB) towards the switched off EM (3aA).

C) A Springcoil (3aC) and/or a Bumper (3aD) redirects the reactive force of the Piston (3aB). Some energy will pass the Springcoil (3aC) and be absorbed by the elastic Bumper container (3aD) while some ricochets the magnet Piston (3aB) towards the EM (3aA).

D) The elastic Bumper (3aD) container absorbs, converts and redistributes some of the reactive Force from the Piston (3aB) coming through the Springcoil (3aC). The Bumper (3aD) consists of liquid or elastic molecules that spread and redirect the force equally in all directions. The inside bottom surface (3aD) is curved in order to spread the reactive force in any other direction than backwards. Some of the reactive energy might convert to heat, noise and other vibrations – and thereby decrease the reactive force and increase the net forward force.

E) An electronic Sensor (3aE) senses the returning Piston (3aB) and switches on the EM (3aA) for a new EMP that starts a new cycle for the PM Piston (3aB). The Sensor (3aE) can be of either a touch sensor that switches on when the Piston (3aB) touches it, or an electromagnet coil that inducts electricity to an electronic switch when the PM (3aB) enters it. The switch (3bI) enables the circuit from the Battery (3bH) that feeds a new pulse for the EM (3aA) that returns the magnet Piston (3aB) for a new cycle.

F) The electromagnetic Induction coil (3aF) coats the cylinder (3aO) around the permanent magnet (3aB). The PMr Piston (3aB) induces electricity in the Induction coil (3aF) and thereby convert some of the reactive kinetic energy from the PMr Piston (3aB) into electric energy. The inducted AC (alternate currency) converts to DC (direct currency) in the AC/DC converter (3aG) in order to store energy in the Battery/Accumulator (3aH).

Figure 3b shows; (G) AC/DC converter (1bG); (H) Electric chargeable Battery/Accumulator (1bH); (I) Electric power and pulse Regulator (1bI) for the EM (1aA) to generate EMP; and (J) External power source, i.e. generator, solar panel etc., (3bJ) for the EMP-PPS that connects the Battery/Accumulator (1bH).

4. The Parallel thrusting system

The Parallel thrusting system refers to claim 4 and is characterize by multiple basic engine units that are mounted in parallel to each other so that the forward thrust provided to the system is multiplied. Figure 4a shows 20 multiple basic EMP-PPS units mounted in parallel directly to the EV's bearing construction that provides 20 times forward thrust.

Figure 4b shows all that the multiple EMP-PPS solutions needs a Power module (1bH) and control module (1bI) to energize, control, coordinate and synchronize their EMP.

5. The XYZ Maneuver module

The EMP-PPS XYZ Maneuver module is characterized by mounting at least six EMP-PPS engine units to provide the EV with thrust in any direction. There are four minor EMP-PPS engine units mounted in +x, -x, +y and –y directions (axis), in addition to the forward main engine in +z direction. However, an EMP-PPS unit in backwards (–z) direction is not necessary, since the +z forward units can be turned 180 degrees by the maneuvering units and thereby utilized for deceleration of +z direction instead of acceleration in –z direction.

The EMP-PPS 'Controller module' (4bI) will provide the XYZ electro-magnets (EMf) with the required electronic pulses for maneuvering in the XYZ-axis of the Cartesian coordinate system. An advanced computerized 'Controller module' as in figure 8 is necessary to control the engine units this the maneuvering module.

Detailed descriptions to figure 5a, 5b, 5c, 5d, 5e and 5f:

a) Two EMP-PPS units are mounted in opposite directions in the z-axis (forward and backwards thrust).

b) Two EMP-PPS engine units are mounted in opposite directions in the x-axis.

c) Two EMP-PPS engine units are mounted in opposite directions in the y-axis.

d) Four EMP-PPS engine units are mounted in opposite directions in the z-axis (forward and backwards thrust).

e) Four EMP-PPS engine units are mounted in opposite directions in the x- and y-axis (maneuver module for +x, -x, +y and –y directions).

f) Four major EMP-PPS engine units are mounted in parallel to maximize forward thrust (+z). Four minor EMP-PPS engine units are mounted as in figure 5e to enable +x, -x, +y and –y

thrust maneuverability in addition. Backwards thrust (-z) can be provided by letting the xy engine units turn the EMP-PPS 180 degrees.

Supporting energy and control modules are required for advanced maneuver modules (see also figures 7 and 8).

6. The Decentralized EMP-PPS

The decentralized maneuvering system refers to claim 6 and is characterized by mounting the EMP-PPS units and modules anywhere at the bearing construction to improve their function. Still, a central power module (fig. 9) and a central controller module (fig 8) are connected to them. The EMP-PPS can use a central control and power module from the EV, if available. As in claim 5, this EMP-PPS also comprises six basic engine units, however positioned at each end of the x-axis, y-axis and z-axis of the bearing construction of the electrical vehicle's rack cabinet. Figure 6b shows the bearing construction for the EMP-PPS, figure 6c and 6d shows examples of EVs for space like cubesats and nanosats.

7. The Centralized EMP-PPS board

The centralized maneuvering system refers to claim 7 and is characterized by mounting the EMP-PPS units and modules at a single board at the bearing construction as best for their function. Still, a central power module (fig. 9) and a central controller module (fig 8) are connected to them. The EMP-PPS can use a central control and power module from the EV, if available.

8. The Power module

The EMP-PPS Power module is characterized by stable and sufficient power supply for all EMP-PPS units, modules and devices, internal as well as external, to all times for the EV's purpose. Therefore, the units and powers depend on the EMP-PPS BEV's (battery driven electric vehicles) size, powers, environment and tasks.

Figure 7: shows that the EMP-PPS Power module should at least consist of:

- Figure (7aG) and (7bG): AC/DC converter for the electric Battery/Accumulator.
- Figure (7aH) and (7cH): Electric chargeable Battery/Accumulator preferably Lithium-ion (and similar lithium polymer) batteries.
- Figure (7aI): Electric power and pulse Regulator to generate EMP or preferably computerized 'Controller module'.
- Figure (7dJ): External power source like Generator and energy converters as solar panel and/or RTG.

9. The Controller module

The EMP-PPS Controller module is characterized by a computer that controls the EMP frequencies, altitudes and waveforms. It can also be used to control additional supporting features, processes and devises to provide better adjustments, tunings, operations, navigations and maneuvering. The EMP-PPS Controller module can consist of one or more Raspberry Pi 2 Model B Project Board that has 1GB RAM, 900 MHz Quad-Core CPU, 4 USB ports, 40 GPIO pins, Full HDMI port, Ethernet port, combined 3.5mm audio jack and composite video, Camera interface (CSI), Display interface (DSI), Micro SD card slot and VideoCore IV 3D graphics core. Furthermore, Windows 10 IoT operating system is recommended and will provide well-known interface for, device connections, program applications and operations. Different kinds of CPU and OS can be used for the EMP-PPS Controller module. More robust and simpler computers might be required for harsh environments like in space.

For EMP regulation, the controlling module is characterized by: Sensors (9dE/1aE) for the returning Piston (9dB/1aB) and timer for magnets' frequencies. Extraordinary timeout trigger of EMP if the Piston (9dB/1aB) is stuck. Regulation of voltage and timing trigger for EMP. Sensors and Regulator for heat, vibrations, solar power (8dJ) and Battery/Accumulator (8cH). Sensors for acceleration speed, and direction. Programmable route and maneuvering of multiple EMP-PPS units via the output sockets. Recording of data by external sensors, video, signals and processing capacities for data.

The Controller module is also characterized by activating, synchronizing and cooperating multiple EMP-PPS units for desired and required maneuvering of the EMP-PPS by sensing conditions and activate Switches for all the EMP-PPS units.

The Controller module is also characterized by capabilities to provide several general uses for the EV (electrical vehicle) like information collection and storage, communication, interoperability, programming routes, maneuvering with radio contact, GPS, gyroscope, reaction to obstacles etc.

Detailed descriptions to figures 8a, 8b, 8c and 8d:

- Figure (8a) shows the preferred Raspberry Pi 2 Model B Project Board with Windows 10 OIT.
- Figure (8b) shows the Minnowboard MAX with the Intel Atom E38XX series SOC at its core.
- Figure (8c) shows the Intel Galileo with Intel x86 architecture that support previous Windows OS.
- Figure (8d) (1a, 1b) shows the how the Controller module (1bI) is related to the EM (1aA).

10. The Hull and Bearing construction

The bearing construction to the EMP-PPS is characterized by having all the EMP-PPS unites and modules mounted to it and an Electrical Vehicle's hull as well. The EMP-PPS bearing construction can have any form as long as it provides fixed mounting for the EMP-PPS unites, modules and/or a hull. Typically, shapes are as for other vehicles like landcrafts and watercrafts.

11. The Electric Vehicles (EV) layouts

The Electrical Vehicles (EV) layouts are characterized by any kind of vehicle, even not yet electrical, i.e. watercrafts, railway trains and automobiles, that can be powered by EMP-PPS. The EMP-PPS EV (Electric Vehicles) layouts are characterized by proper and rational combination and placements of all the EMP-PPS units, modules and devices in order to enable the EV's purpose. The EMP-PPS are useful in liquid, but less competitive to traditional motor vehicles on the ground. However, an EV on wheels that use the EMP-PPS Motor unit needs deviating solutions in particular for steering mechanism that should be as for cars and trains. An EV on low gravity surface might gain advantages in combining the EMP thrust and motoric wheels.

How the invention can be realized

An EMP Piston Propulsion System can be complex and consist of several engine units and supporting modules for energy and control. However, building prototypes and testing out the basics and the EMP-PP system's engine units should be rather straightforward, when using the EMP-PPS description and figures. Note that in contrast to the combustion engine, the main goal is to maximize the net forward force (Fn = Fe - Fr) by reducing the reactive force on the Piston by absorbing, converting and/or redirecting. The force applied at the front-end should be measured while using an oscillator to optimize the EMP frequency and altitudes. The EMP-PPS Motor unit should be rather straightforward to build and test since it is an EMP version of the combustion engine.

Another challenge is to design a system that optimizes the energy consumed and utilized for motion, - in addition to utilizing the 'damped energy. The 'wasted' energy will primarily be frictions, vibrations and noises. Friction will convert to heat that can be useful in cold environments. However, this return motion could also be used to induce new electric energy to the Power module and Battery. The noise is useless and vibrations can even harm sensitive equipment. Vibrations should be minimized. Furthermore, electromagnetic interferences can disturb the functioning of the EMP-PPS if not handled properly.

The Controller module will require considerable planning and work to realize, due to the numerous possibilities. The planning and testing should be divided into several sub-projects. Raspberry Pi 2

computer kit with Windows 10 IoT as operating system and related applications are recommended to use for a start due to its price, functionalities, flexibility, applications and hardware IO (In/Out units). The computer can be programmed for EMPs oscillation, performance monitoring and tuning, environmental monitoring, telecom, remote control and maneuvering to pre-programmed routes. It is recommended to use Microsoft Visual studio for programming the Windows IoT operating system. There should be sub projects for all these tasks. However, more robust and simple computers will be necessary in real space environments.

The power generators and batteries can be assembled with modified well-known products, for example Tesla's SOLN1 25 Kit. Small electromagnets, requiring 12V / 0.5A can provide powers equally up to 5Kg thrust. A small test environment for 6 such electromagnet to realize figure/Claim 5 is relatively simple, - in a proper equipped lab.

The EMP-PPS design is for any kind of environment, which includes surface and water. It can however be tested at low friction surface for acceleration and 2D maneuvering. 3D maneuvering can be done in liquid like water.

Known and relevant technologies and Prior Arts

The Electromagnetic Pulse - Piston Propulsion System (EMP-PPS) is a hybrid design based on the principles of the combustion engines and the electromagnetic engines. However, the main difference between the combustion engine and the EMP engine is that the EMP Piston is utilized to minimize, not maximize, the backwards reactive force in order to maximize the net forward thrust via the cylinder top to the bearing construction of the electric vehicle. There are two main areas of theories involved; Newton's three Laws for mechanical motion and the laws of electromagnetic forces and energy. However, some scientists have been sceptic to the EMP-PPS solution to the equilibrium of Newton's third law. Therefore, the following briefly describes these principles in order to show the new solution of the EMP-PPS.

Newton's 3 laws of motion

Newton's 3 laws of motion say that:

1. When viewed in an inertial reference frame, an object either remains at rest or continues to move at a constant velocity, unless acted upon by an external force.
2. The vector sum of the external forces F on an object is equal to the mass m of that object multiplied by the acceleration vector of the object: F = ma.

3. When one body exerts a force on a second body, the second body simultaneously exerts a force equal in magnitude and opposite in direction on the first body.

Figure PA.1 illustrates the 3rd Newton's Law of motion that is challenged and solved by the EMP-PPS. The EMP-PPS utilizes all Newton's three laws in the sense that it will keep its velocity when turned off. It will accelerate (Fa) when turned on due to reduction of the reactive/opposite force (Fr). The forward thrust cause acceleration a = (Fa-Fr)/m.

Some theorists argue that a closed propulsion system cannot move due to Newton's third law and the law of conservation of momentum. Such assumptions do not consider that the reactive force can be absorbed, converted or redirected inside the object. Similar assumptions would lead to a conclusion that the combustion engine could not work either, if the blast force in the chamber was not redirected by a piston. However, the combustion engines do exist and work well for gasoline vehicles. Therefore, there are reasons to utilize alternative solutions to EMP Pistons for EV (electric vehicles) as well. Following are some examples to illustrate principles used.

The 3 figures PA.2 show three known examples to support the EMP-PPS hypothesis: (PA.2a1): The girl could get a forward thrust by simply beating at the front of the cart because she will absorb the reaction energy and force. Figure (PA.2b): The horseless car with a combustion engine would not work without converting the explosion in the cylinder to kinetic energy to the piston and further alter the direction of the reactive force to rotation of a connecting rod and crankshaft. (PA.3c): If a reactive object hits multiple minor objects, like 'breaking' in billiard, the yellow ball at the front will not hit with full force the wall to the end, if reaching it at all, because the reactive force will be divided and redirected by the other balls, in a cascade of chain reactions, like molecules in liquid that spread out energy waves.

These three well-known principles of reducing the reactive force are utilized by the EMP-PP engine to reduce the reactive force and thereby increase the net forward thrust to its EV (electrical vehicle).

The combustion engine

The combustion engine is a propulsion system and described in Wikipedia: "An internal combustion engine (ICE) is a heat engine where the combustion of a fuel occurs with an oxidizer (usually air) in a combustion chamber that is an integral part of the working fluid flow circuit. In an internal combustion engine, the expansion of the high-temperature and high-pressure gases produced by combustion apply direct force to some component of the engine. The force is applied typically to Pistons, turbine blades, or a nozzle. This force moves the component over a distance, transforming chemical energy into useful mechanical energy."

(Ref. https://en.wikipedia.org/wiki/Internal_combustion_engine

Figure PA.3 shows a diagram of a cylindrical container of a gasoline engines, comprising:

C: Crankshaft

E: Exhaust camshaft

I: Inlet camshaft

P: Piston

R: Connection rod

S: Spark plug

V: Valves, intake & outlet

W: cooling water jacket

In the Electromagnetic Pulse - Piston Propulsion System (EMP-PPS), the spark-plug and crankshafts are replaced with and EM (elector magnet) and the piston replaced with an EM or PM (Permanent Magnet).

Permanent and Electronic Magnets (PM and EM)

The principles of the permanent magnet (PM) and the electronic magnets (EM) are described at Wikipedia: “A (permanent) magnet is a material or object that produces a magnetic field. This magnetic field is invisible but is responsible for the most notable property of a magnet: a force that pulls on other ferromagnetic materials, such as iron, and attracts or repels other magnets.” “Permanent magnets are made from "hard" ferromagnetic materials such as alnico and ferrite that are subjected to special processing in a powerful magnetic field during manufacture, to align their internal microcrystalline structure, making them very hard to demagnetize.” Some electric motors rely upon a combination of an electromagnet and a permanent magnet, and, much like loudspeakers, they convert electric energy into mechanical energy. A Generator is the reverse: it converts mechanical energy into electric energy by moving a conductor through a magnetic field.” (Ref *https://en.wikipedia.org/wiki/Magnet*)

“An electromagnet is a type of magnet in which the magnetic field is produced by an electric current. The magnetic field disappears when the current is turned off. Electromagnets usually consist of a large number of closely spaced turns of wire that create the magnetic field. The wire turns are often wound around a magnetic core made from a ferromagnetic or ferrimagnetic material such as iron; the magnetic core concentrates the magnetic flux and makes a more powerful magnet. The main advantage of an electromagnet over a permanent magnet is that the magnetic field can be quickly changed by controlling the amount of electric current in the winding. However, unlike a permanent

magnet that needs no power, an electromagnet requires a continuous supply of current to maintain the magnetic field. Electromagnets are widely used as components of other electrical devices, such as motors, Generators, relays, loudspeakers, hard disks, MRI machines, scientific instruments, and magnetic separation equipment. Electromagnets are also employed in industry for picking up and moving heavy iron objects such as scrap iron and steel." (Ref. https://en.wikipedia.org/wiki/Electromagnet)

The 2 figures in PA.4 illustrates the forces of permanent magnets. Figure (PA.4a) shows that PM produces attracting and detracting forces dependent on their polarities. Figure (PA.4b) shows that an EM makes a current electric flow through a coil. The EM polarity can alternate by simple reversing the DC (direct current) flow. It shuts off when there is no DC. Variations in the DC voltage makes the EM pulse converted to mechanical waves like in loudspeakers. An EMP will push or pull other magnets dependent on their polarity.

The two figures in PA.5 illustrates the forces of electro magnets. Figure (PA.5a) shows that an electric generator (or battery) generates DC that makes the iron core magnetic, that will push or pull the iron rod (PM) dependent on the polarity. Figure (PA.5b) shows the principle for traditional electronic motor. The four (or more) electromagnets alternate polarities to push and pull the PM, causing a rotating motion of the PM.

Note that the EMP-PPS do not use the traditional electric motor principle with a rotating magnet. The EMP-PPS utilize an EM to push and pull a PM (or a second EM), - like a Piston in a gasoline engine.

Figure (PA.5c) illustrates the forces of an EM and a PM are mathematically described as:

$F(em) = (k*q1*q2)/(r^2)$

$F(pm) = qv*Bv$

The vector of the forces is described with 'v' that means changing the direction is reducing the force in the original direction.

In practical words, motions can be made with electromagnets (EM), permanent magnets (PM) and combinations of them. If a magnet is moved towards another magnet of same polarity, - the other magnet will move away in the same direction. In that way, an EM can be used to make EMP (electromagnetic pulses) of desired magnitudes, waveforms and frequencies to make motions on itself, other magnets and objects attached to them.

Mathematically, the formula for kinetic energy and force is: $Ek = (1/2)*m*v^2$ and $F = m*a(v)$ where v indicates the direction. Changing the direction will reduce the direct reactive force.

Electromagnet pulsing and induction

The principles of (non-nuclear) Electromagnet pulsing (EMP) is published on Wikipedia: "EMP is a short burst of electromagnetic energy. Such a pulse may occur in the form of a radiated, electric or magnetic field or conducted electric current depending on the source, and may be natural or man-made." "An electromagnetic pulse is a short burst of electromagnetic energy. Its shortness means that it will always be spread over a range of frequencies. Pulses are typically characterised by: The type of energy (radiated, electric, magnetic or conducted), the range or spectrum of frequencies present and Pulse waveform: shape, duration and amplitude." https://en.wikipedia.org/wiki/Electromagnetic_pulse.

The principles of electromagnetic induction are published on Wikipedia: "Electromagnetic induction is the production of an electromotive force across a conductor when it is exposed to a time varying magnetic field. It is described mathematically by Faraday's law of induction." https://en.wikipedia.org/wiki/Electromagnetic_induction

The figures in PA.6 illustrates howto combine the magnetic forces of an 'EMP Engine'. Figure (PA.6a) shows that combining an EM with a spring coil that can force a piston in moving back and forth. Figure (PA.6b) shows that moving a PM in and out an electric coil will induct alternating currencies AC. With a DC carrier, the currencies will be variable DC.

Rocket engine - Prior art

The (gasoline) rocket engine is also a propulsion system and described in Wikipedia: "A rocket engine is a type of jet engine that uses only stored rocket propellant mass for forming its high speed propulsive jet. Rocket engines are reaction engines, obtaining thrust in accordance with Newton's third law. Most rocket engines are internal combustion engines, although non-combusting forms also exist. Vehicles propelled by rocket engines are commonly called rockets. Since they need no external material to form their jet, rocket engines can perform in a vacuum and thus can be used to propel spacecraft and ballistic missiles." (Ref. https://en.wikipedia.org/wiki/Rocket_engine)

Figure PA.7 illustrates the forces used for forward thrust in rocket engines. Figure (PA.7a) shows utilization of Newtons 3 law by letting the action Forse (Fa) push the object forward while the reatctive Force (Fr) is let out and reduced to zero in the system. The net forward thrust force equals Fa minus Fr. Figure (PA.7b) shows this same principle realized in (gazolin) rocket propulsion.

In the closed Electromagnetic Pulse - Piston Propulsion System (EMP-PPS), the reactive force will be reduced by abosorbing, converting and redirecting internally.

EMP-PPS utilization of Prior arts

Some scientists are skeptical to the EMP-PPS solution due to the equilibrium of Newton's third law. However, it should be possible to make a hybrid engine like EMP-PPS by use of magnetism instead of combustion based on the mentioned theories and realities. To put it simple, imagine the combustion engine where the 'top cylinder head' is replaced by an electromagnet producing EMP and the top of the piston is another electromagnet with synchronized pulse of the same polarity.

A forward thrust force equals the reduction of the direct reactive force. Therefor the challenges for an EMP-PPS is to absorb, convert and/or redirect the reactive force as much as possible. The kinetic (motion) energy (Ek) of the 'magnetic piston' can be converted to any other kinds of energy, - like; kinetic, potential mechanical, mechanical wave, chemical, electric, magnetic, radiant, nuclear, ionization, elastic, gravitational, rest mass, thermal, heat and mechanical work. The kinetic energy from the piston should be converted to reusable kinds of energy for savings or utilized for other kinds of work, like mechanical work for operational tasks.

Although uncontrolled high voltage EMP can interfere with electronics, these should not be confused with like NEMP (Nuclear EMP). Electronics in the EV (electronic vessel) should therefore be shielded by a Faraday's cage to avoid disruptions form the EMP. https://en.wikipedia.org/wiki/Faraday_cage

The power required from the EMP-PPS depends on the size and quality of the two electromagnets (EMf & EMr), the pulse frequency, the voltage and the pulse waveform. Therefor the system needs some sensors to monitor and measure what optimal utilization, - and preferably oscillators to produce the most efficient EMP. The control module should also provide some feedback system to optimize the efficiency of the EMP-PPS.

List of figures

The first list of figures refers to the Patent's Claims and to the chapter 'Summary description of the EMP-PPS units and modules'. The second list of figures refers to the chapter 'Known and relevant technologies and Prior Arts' (PA).

The EMP-PPS invention

Figures 1 shows 3 drawings of the basics of the EMP-PSS engine unit, where (1a) shows a drawing of the EMP-PPS basic engine unit, (1b) shows the supporting EMP-PPS units and modules and (1c) shows an external view of the EMP-PS basic engine unit container.

Figure (2a) is based on figure (1a) and shows the EMP-PPS Motor unit that is an EMP hybrid of the combustion engine that can convert the reactive kinetic energy to motoric work for devices like drills

(2aE1), pumps (2aE2), wheels (2aE3), dynamos (2aE4) and propellers (2aE5). Figures (2aF1) and (2aF2) shows that multiple EMP-PPS Motor units can be combined into V-engine designs like the combustion motors.

Figures 3 is based on figure (1a) and (1b) where figure (3a) shows the Induction unit with an Induction coil that coats the EMP-PPS Basic unit. Figure 3b) shows the electric connections to supportive modules like the AC/DC converter (3bG), Batteries (3bH), Controller module (3bI) and power source (3bJ).

Figure (4a) is based on figure 1a and shows an example of multiple parallel units combined to multiply the net active force (forward thrust). Figure (4b) shows the basic supporting modules and units.

Figures 5 is based on figure (1a) and (1b) and shows the EMP-PPS XYZ Maneuver module. Figure (5a) shows two EMP-PPS engine units mounted in opposite directions in the z-axis to provide forward and backwards thrust. Figure (5b) shows Two EMP-PPS engine units mounted in opposite directions in the x-axis. Figure (5c) shows Two EMP-PPS engine units mounted in opposite directions in the y-axis. Figure (5d) shows four EMP-PPS engine units mounted in opposite directions in the z-axis to provide forward and backwards thrust. Figure (5e) shows four EMP-PPS engine units mounted in opposite directions in the x- and y-axis to provide maneuvering module for +x, -x, +y and –y directions. Figure (5f) shows a complete EMP-PPS consisting of four large EMP-PPS engine units for forward z thrust and four small EMP-PPS engine units for XY maneuvering and supporting energy and control modules.

Figure (6a) shows how the EMP-PPS units can be decentralized mounted to the EV bearing construction and with connection to centralized power, and controller modules. Fig (6b) shows a bearing construction. Fig (6c) and (6d) shows a cubesat and a nanosat that can host EMP-PPS.

Figures 7 shows the supporting power units and modules to the EMP-PPS. Figure (7a) shows figure (1b) with the EMP-PPS supporting power units and modules. Figure (7bG) shows an AC/DC converter Figure (7cH) shows a Battery/Accumulator. Figure shows (7dJ) Power sources like a RT generator and solar panels.

Figures 8 shows a Controller module for the EMP-PPS. Figure (8a), (8b) and (8c) show three relevant computer boards. Figure (8d) consists of figure (1a) and (1b) and shows the connection to the EMP-PPS Basic unit to the controller module (1bI), the battery (1bH), the power source (1bJ) and the AC/DC converter (1bG).

Figures 9 shows EMP-PPS layouts for several kinds of Electric Vehicles (EV). Figure (9a) Submarines, (9b) ships, (9c) trains, (9d) satellites, (9e) drones, (9f) mobiles and (9g) remote controls to the EMP-PPS controller (1bI).

Prior Art (PA) and Theories

Figures. PA.1: Illustrates the 3rd Newton's Law of motion (PA.1a)

Figures. PA.2: Illustrates 3 ways of absorbing (PA.2a), converting (PA.2b) and redirecting (PA.2c) the reaction force.

Figures. PA.3: Illustrates a diagram of a cylinder as found in 4-stroke gasoline engines (PA.3a).

Figures. PA.4: Illustrates the forces of permanent magnets (PA 4a and 4b).

Figures. PA.5: Illustrates the forces of electro magnets in the 3 figures PA.5a, 5b and 5c.

Figures. PA.6: Illustrates how to combine the magnetic forces of an 'EMP Engine' in figure PA.6a and 6b.

Figures. PA.7: Illustrates the forces used for forward thrust in rocket engines in figures PA.7a and 7b.

PATENTKRAV til opfindelsen

ELEKTROMAGNETISK PULS – STEMPEL FREMDRIFT SYSTEM

Krav 1

Et Elektromagnetisk Puls – Stempel Fremdrift System (EMP-PPS) bestående af en basal motor enhed (1A), en controller modul (1bI), og en energikilde modul (1bH); hvori den basale motor enhed består af;

- en cylindrisk beholder (1aO) bestående af en første ende og en andre ende der er placeret i de modsatte ender af den cylindriske beholder og langs dets akses retning;
- en elektromagnet (1aA) der er monteret i den cylindriske beholder (1aO) ved dets første ende; hvori elektromagneten (1aA) er fæstet til bære-konstruktionen til et elektrisk fartøj, og hvorpå elektromagneten genererer en elektromagnetisk puls (1a+) der giver en forover rettet fremdrift (1aFn) til det elektriske fartøj;
- et bevægeligt stempel (1aB) der er placeret i den cylindriske beholder (1aO); hvori stemplet (1aB) består af den andre elektromagnet der genererer samtidigt en elektromagnetiske puls af samme polaritet (1a+) som den første elektromagnets nærmeste ende; hvorpå stemplet (1aB) frastødes fra den første elektromagnet (1aA);
- en returnerende komponent (1aC) der er monteret på bunden af stemplet (1aB); hvorpå støder mod en anden returnerende component (1aD) der er placeret i den andre ende af den cylindriske beholder; hvorpå stemplet (1aB) returnerer tilbage til den første elektromagnet (1aA) igen;
- en dæmpende og returnerende komponent (1aD) der er placeret i den andre ende af den cylindriske beholder (1aO); hvorpå dæmpningen reducerer mindst en del av den reaktive kinetiske energi (1aF) fra stemplet (1aB);
- en elektronisk sensor (1aE) der er tilkoblet den elektriske kreds til elektromagnet(erne) (1aA, 1aB); og
- en elektrisk bryder (1bI) der er tilkoblet en energikilde modul (1bH); hvorpå bryderen tænder for elektromagnet(erne) (1aA, 1aB); hvorpå endda en elektromagnetisk puls (1a+) genereres af begge elektromagneter; hvorpå den første elektromagnet (1aA) forårsager endda et fremdrift stød (1aFn) og endda en cyklus for stemplets (1aB) bevægelser;

der er karakteriseret ved at den dæmpende komponent (1aD) reducerer mindst en del af den reaktive kraft (1aF) fra stemplet (1aB) ved at absorbere, omdirigere og konvertere den kinetiske energi (1aF) til en anden energiform; hvorpå stemplets (1aB) reducerede modkraft resulterer i en

netto forskydning af kræfternes momentum; hvorpå resulterer i en forover rettet fremdrift (1aFn) på den første elektromagnet (1aA); og følgelig den cylindriske beholder (1aO); og følgelig den basale motor enhed (1A); og følgelig den bærende konstruktion og hele det elektriske fartøj.

Krav 2

En EMP-PPS basal motor enhed ifølge krav 1; hvori den andre magnet (2aB) er en elektromagnet eller en permanent magnet; og har samme polaritet (2a+) imod den første elektromagnet (2aA); hvori den dæmpende og returnerende komponent er bestående af;

- en forbindelsestang (2aC) monteret til stemplet (2aB); og
- en krumtap (2aD) monteret til forbindelsesstangen (2aC);

karakteriseret ved at mindst en del av stemplets (2aB) kinetiske energi bliver omdirigeret via krumtappen (2aD) for at operere ekstra udstyr som; driller (2aE1), pumper (2aE2), hjul (2aE3), dynamoer (2aE4) og propeller (2aE5).

Krav 3

En EMP-PPS basal motor enhed tilsvarende krav 1; hvori den magnetiske komponent på stemplet (3aB) er en permanent magnet og bestående af;

- en elektromagnetisk induktions spole (3aF) der dækker den cylindriske beholder (3aO); og
- en AC/DC konverterer (3bG);

karakteriseret ved at konvertere mindst en del av den kinetiske energi fra stemplet (3aB) til elektrisk energi der returneres via induktionsspolens elektriske kredser; hvorpå den generede vekselstrøm konverteret til jævnstrøm i en AC/DC konverter (3bG); hvorpå elektriciteten lagres i et batteri i energikilde modulet (3bH).

Krav 4

Et EMP-PPS hvori systemet er bestående af;

- flere basis motor enheder (4a), tilsvarende ethvert af kraverne 1-3; der er monteret i parallel;
- en computeriseret kontrol modul (4bI); og
- en elektrisk energi modul (4bH);

karakteriseret ved at multiplicere fremdriften (4aFn); til den bærende konstruktion; og følgelig til det elektriske fartøj.

Krav 5

Et manøvrerbart EMP-PPS hvori systemet er bestående af;

- flere basis motor enheder tilsvarende ethvert af kraverne 1-3
- flere basis motor enheder monteret i parallel som i Krav 4;
- flere basis motor enheder monteret i XYZ aksene (5a, 5b, 5c, 5d, 5e, 5f);
- en computeriseret kontrol modul (4bI); og
- en elektrisk energi modul (4bH);

karakteriseret ved at tilføre EMP-PPS fremdrift og manøvrerbarhed i enhver retning i x-aksen, y-aksen og z-aksen (5bF, 5cF, 5aF).

Krav 6

Et decentraliseret EMP-PPS hvori systemet er bestående af;

- flere basis motor enheder og moduler (6a) tilsvarende ethvert af kraverne 1-5;
- separeret og decentraliseret positioneret motor enheder på hver af enderne til x-aksen, y-aksen og z-aksen til den elektriske fartøjs bærende konstruktion (6b);

karakteriseret ved at give fremdrift i enhver retning i x-aksen, y-aksen og z-aksen til den bærende konstruktion (6b) til det elektriske fartøj (6c, 6d) og følgelig manøvrerbar fremdrift til det elektriske fartøj.

Krav 7

Et centraliseret EMP-PPS hvori systemet er bestående af;

- flere basis motor enheder og moduler tilsvarende ethvert af kraverne 1-5;
- samlet og centralt positioneret på et enkelt bræt i den elektriske fartøjs reol kabinet og bærende konstruktion;

karakteriseret ved at give fremdrift i enhver retning i x-aksen, y-aksen og z-aksen til den bærende konstruktion til det elektriske fartøj og følgelig manøvrerbar fremdrift til det elektriske fartøj.

Figure 1

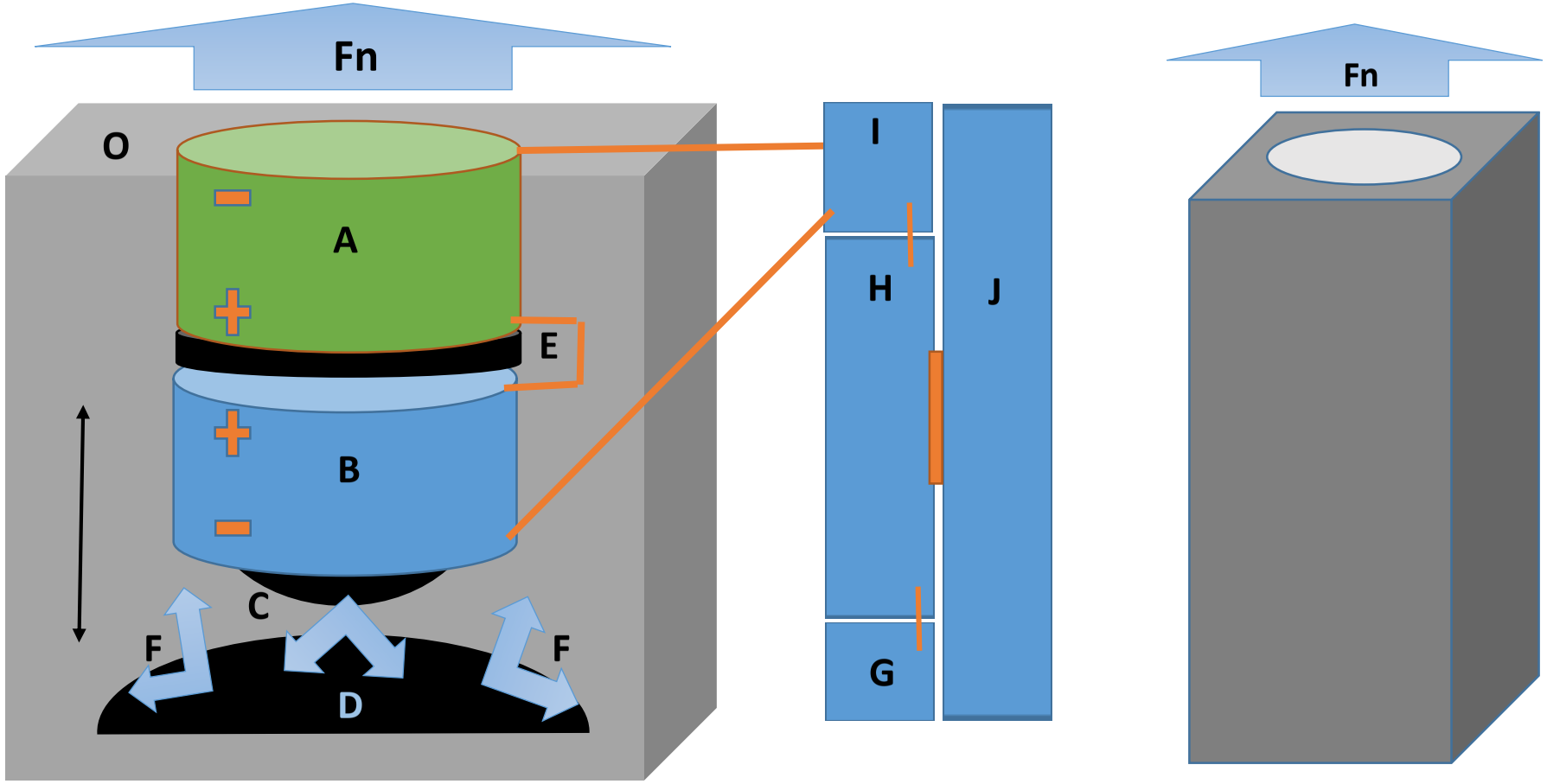


Fig 1a

Fig 1b

Fig 1c

DK 179141 B1

Figure 2

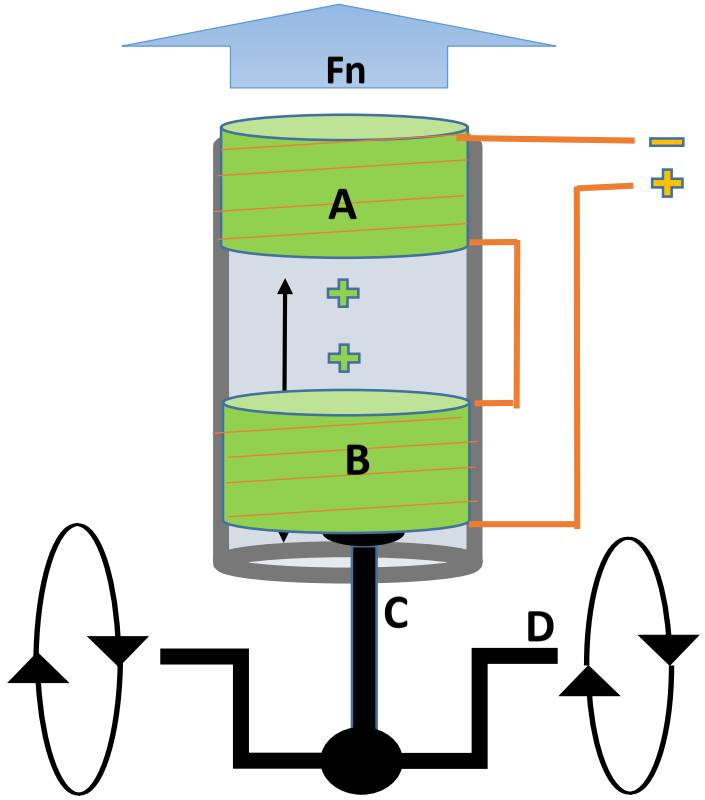
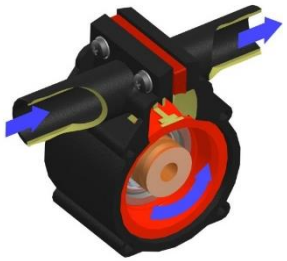


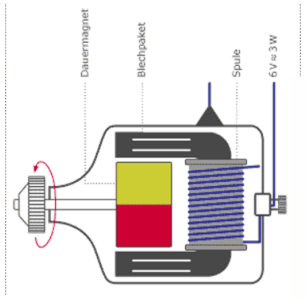
Fig 2a

2aE1



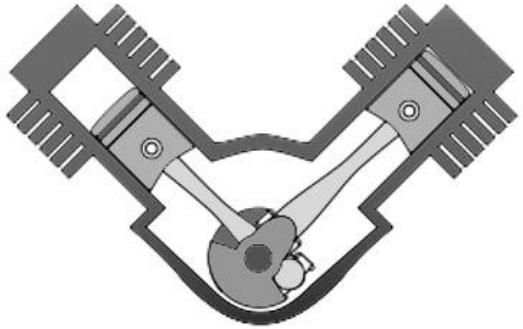
2aE2

2aE3



2aE4

2aE5



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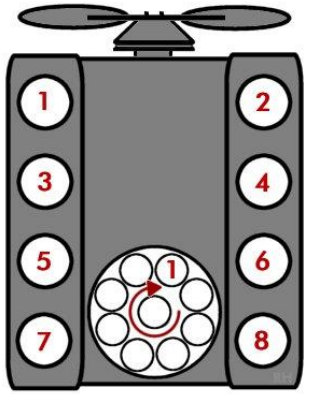


2aF2

DK 179141 B1

Figure 3

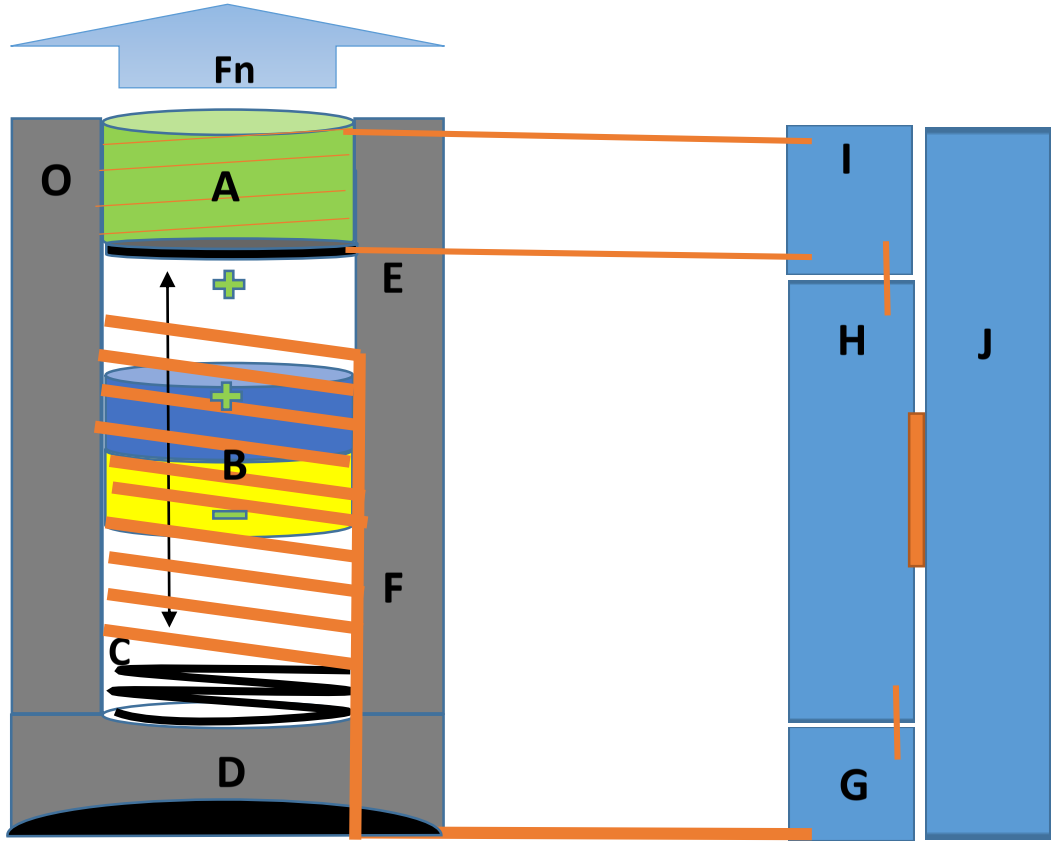


Fig 3a

Fig 3b

DK 179141 B1

Figure 4

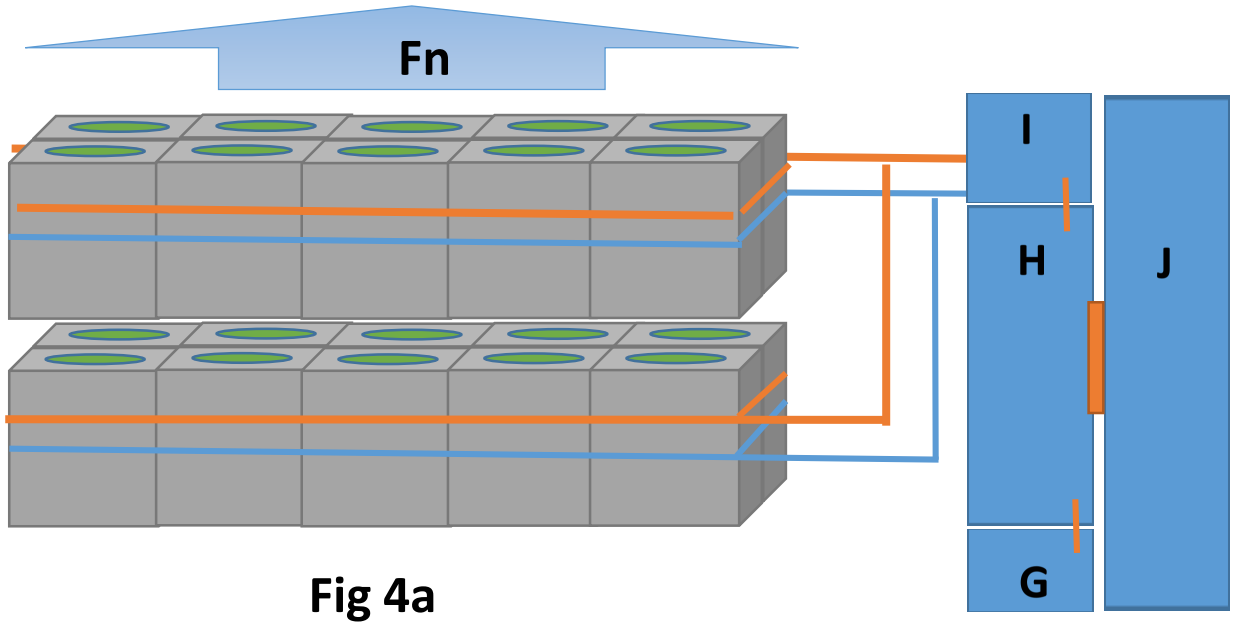
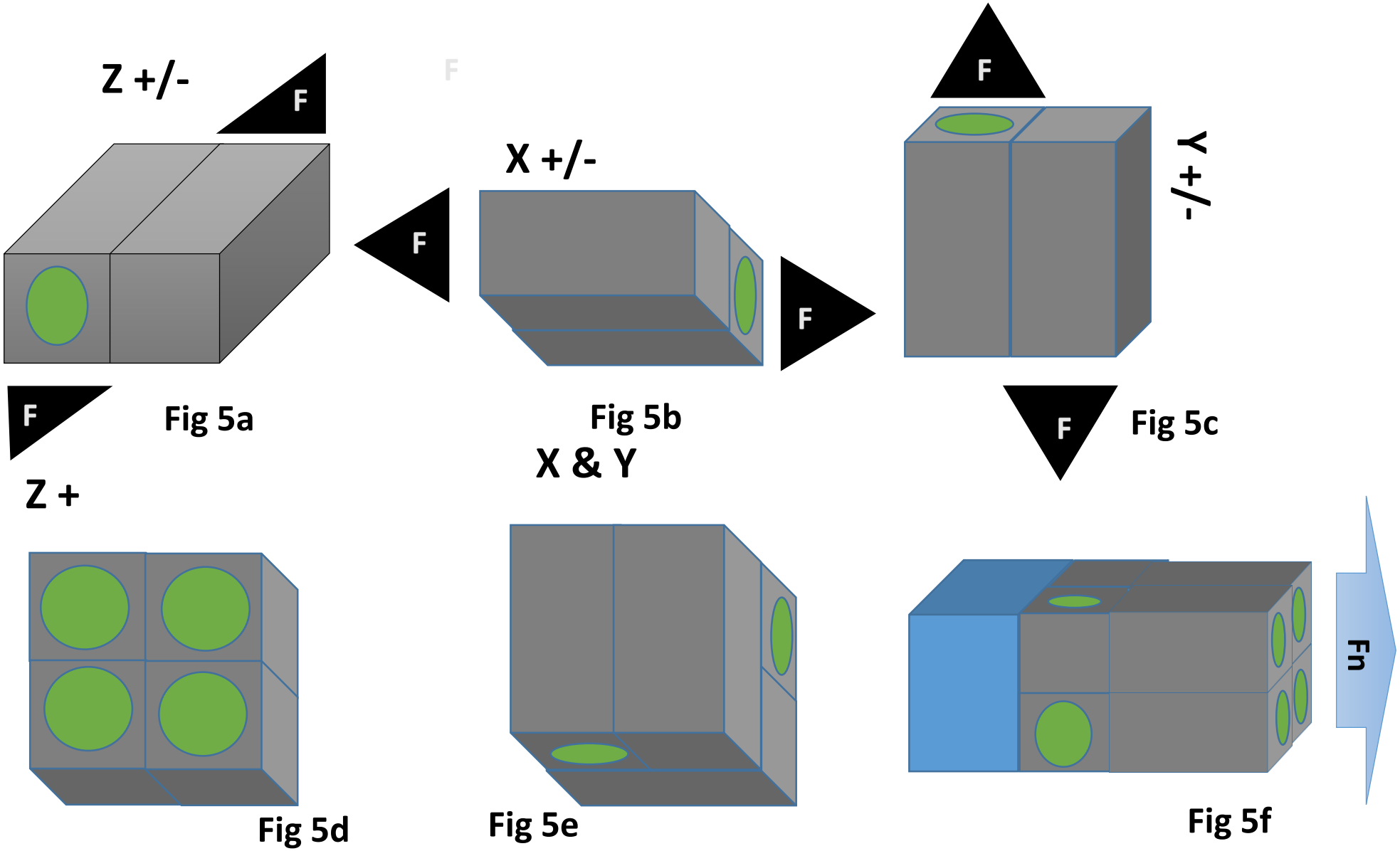


Fig 4a

Fig 4b

DK 179141 B1

Figure 5



DK 179141 B1

Figure 6

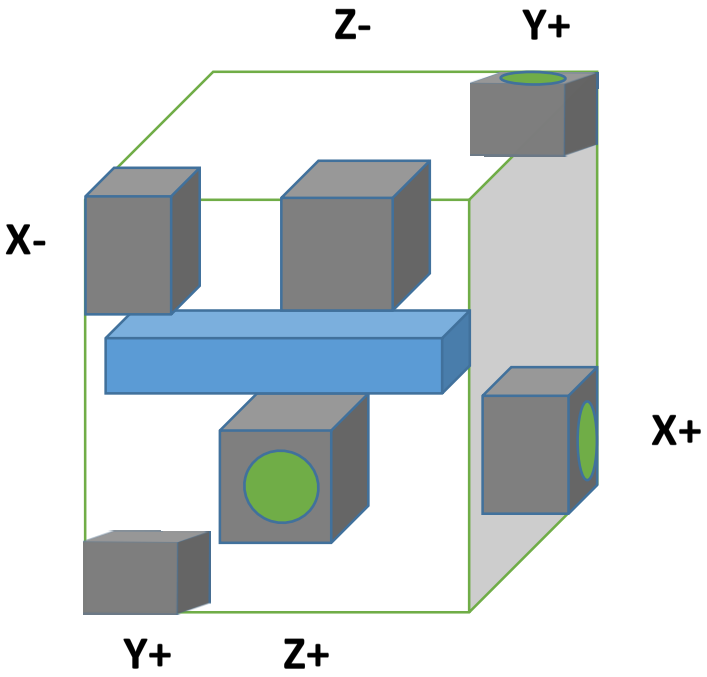


Fig 6a

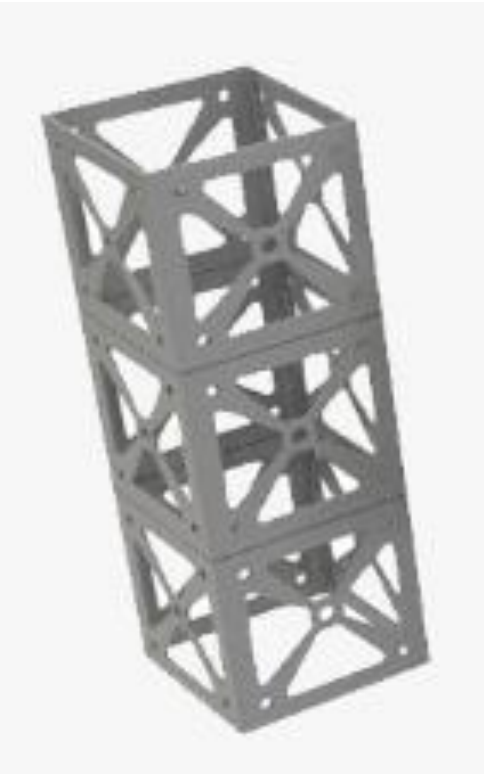


Fig 6b

Fig 6c

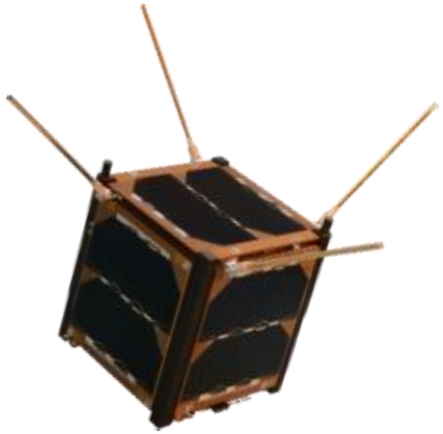


Fig 6d

DK 179141 B1

Figure 7

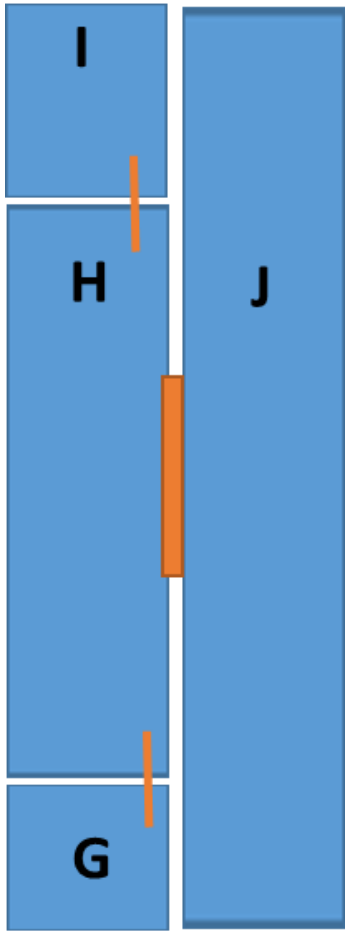


Fig 7a

Fig 7bG

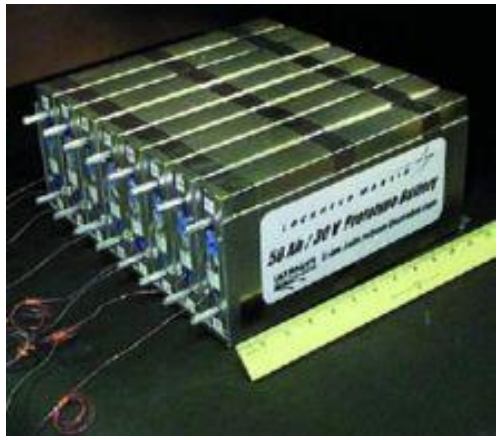


Fig 7cH

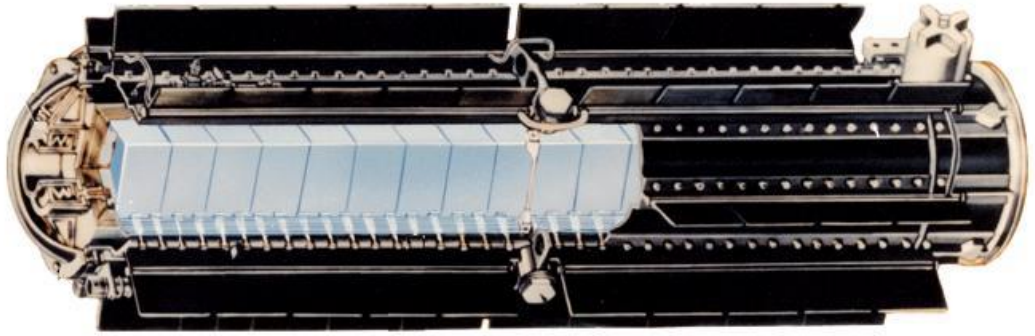


Fig 7dJ

DK 179141 B1

Figure 8

Fig 8a

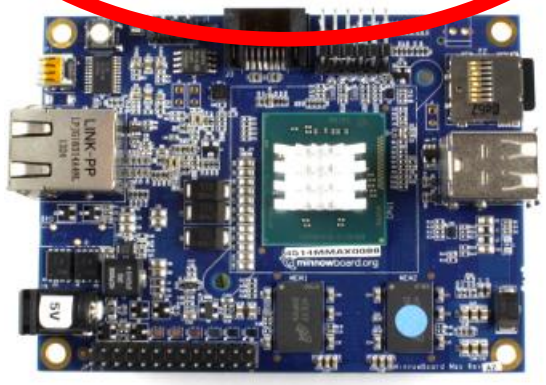
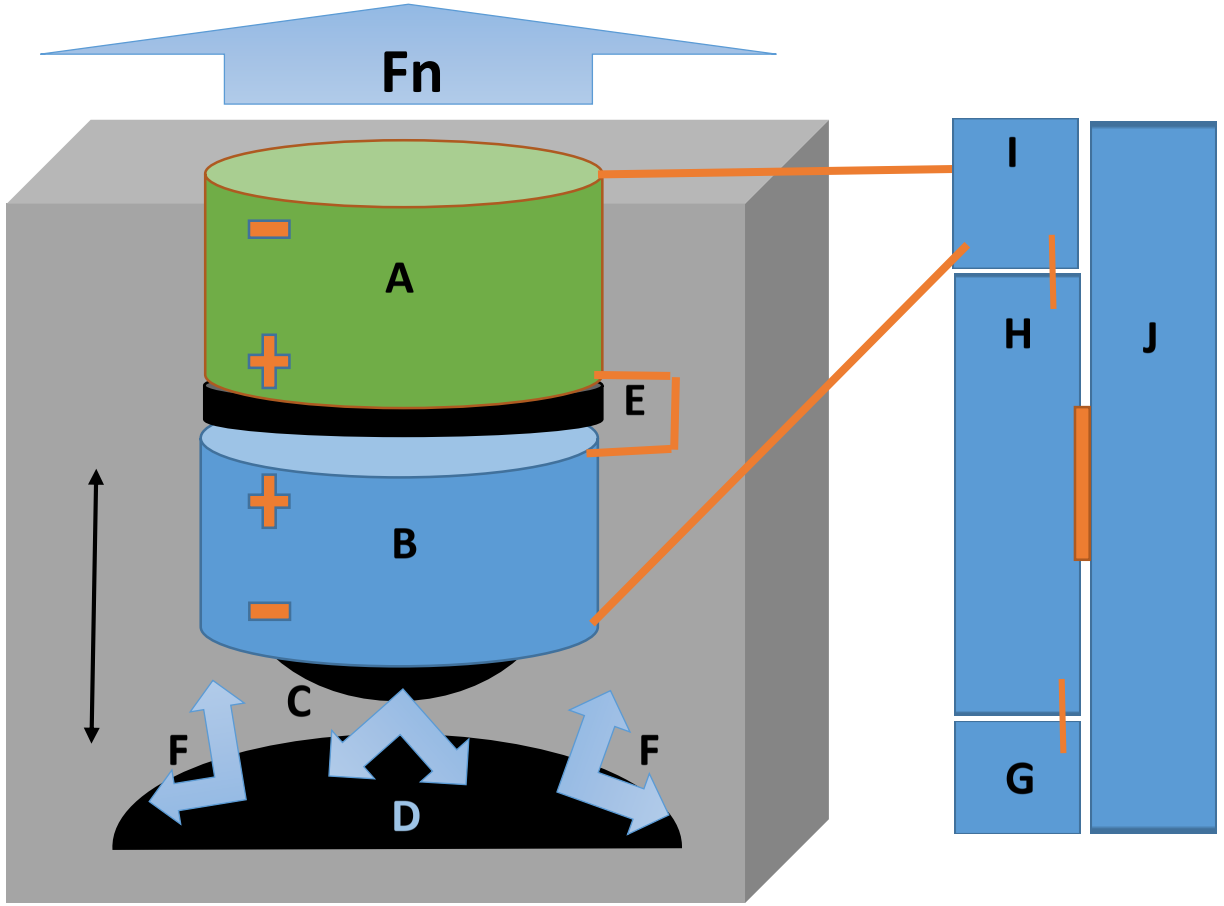


Fig 8b

Fig 1a

Fig 8c



(Fig 1a)

(Fig 1b)

Fig 8d

DK 179141 B1

Figure 9

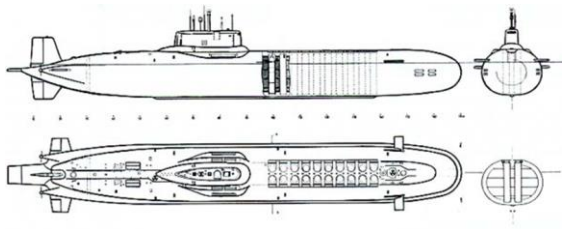


Fig 9a

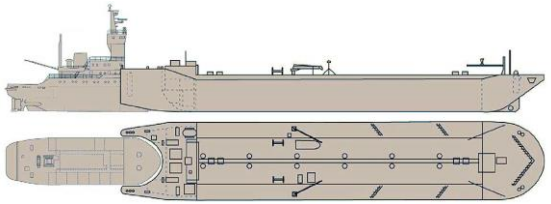


Fig 9b

Fig 9c

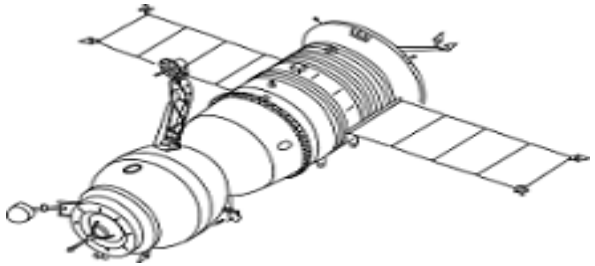


Fig 9d

Fig 9e

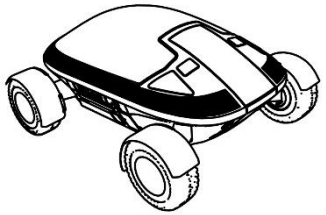


Fig 9f

Fig 9g

DK 179141 B1

Figure PA.1

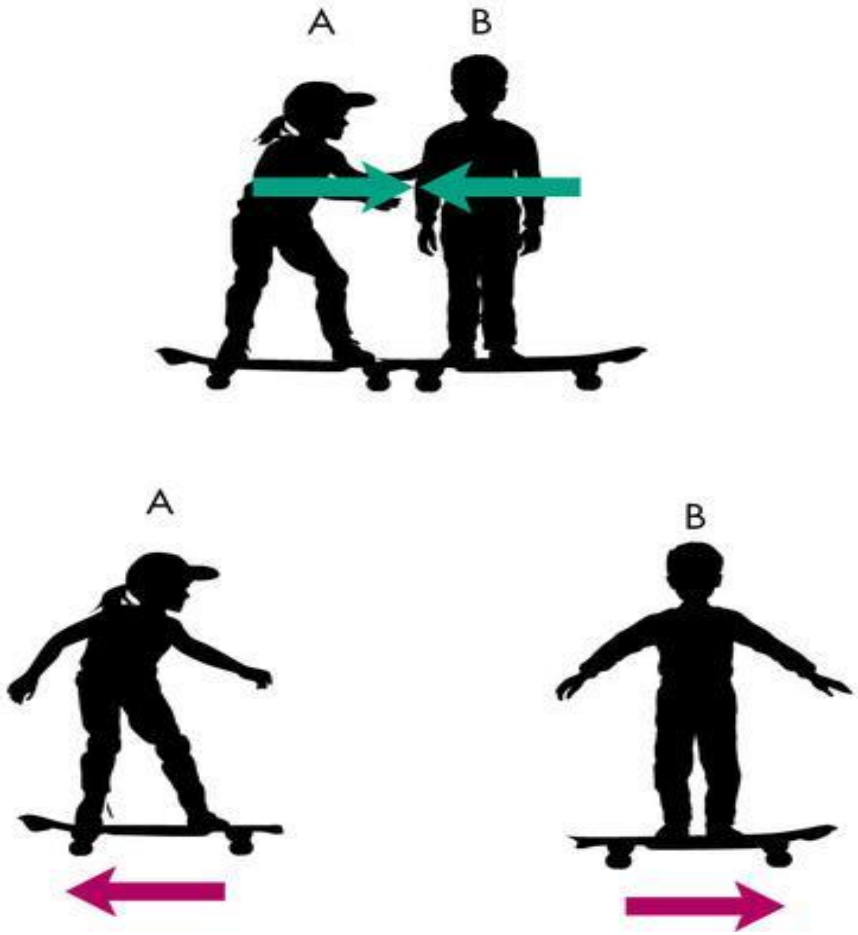


Fig. PA.1a

DK 179141 B1

Figure PA.2

Fig. PA.2a

Fig. PA.2b

Fig. PA.2c

DK 179141 B1

Figure PA.3

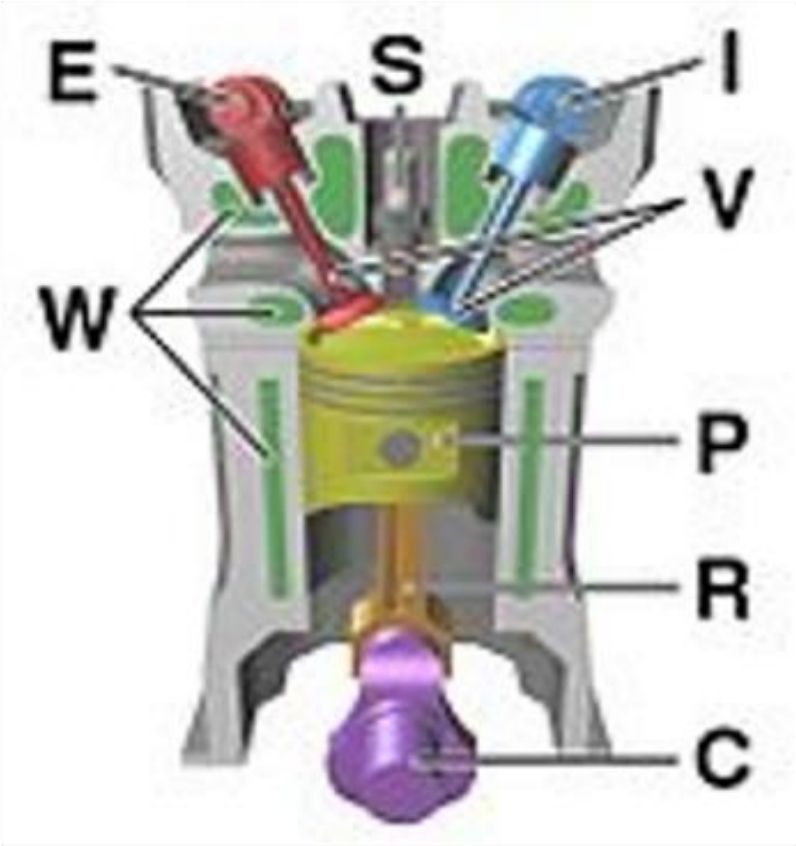


Fig. PA.3a

DK 179141 B1

Figure PA.4

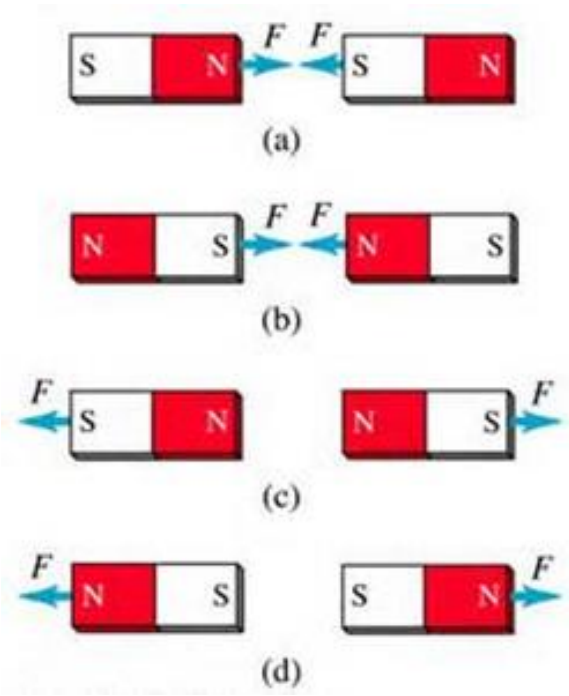


Fig. PA.4a

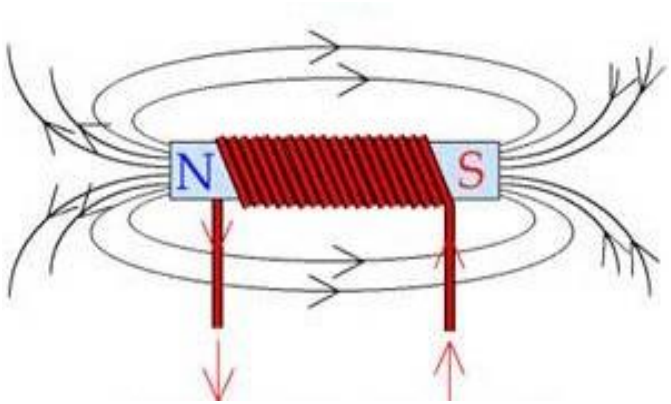


Fig. PA.4b

DK 179141 B1

Figure PA.5

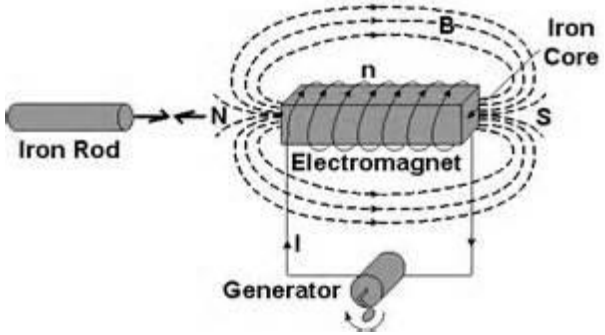


Fig. PA.5a

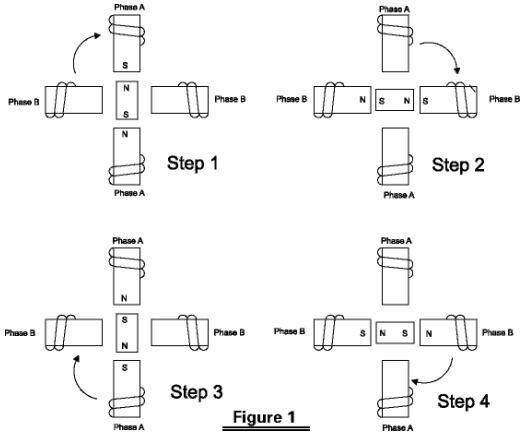


Fig. PA.5b

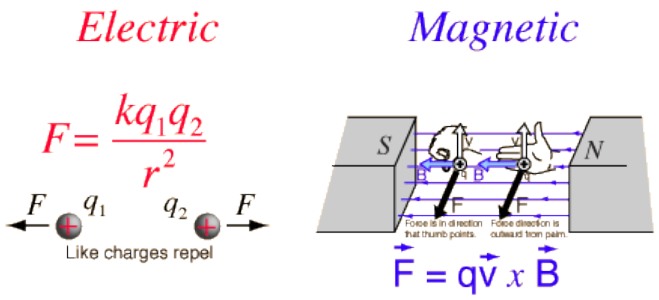


Fig. PA.5c

DK 179141 B1

Figure PA.6

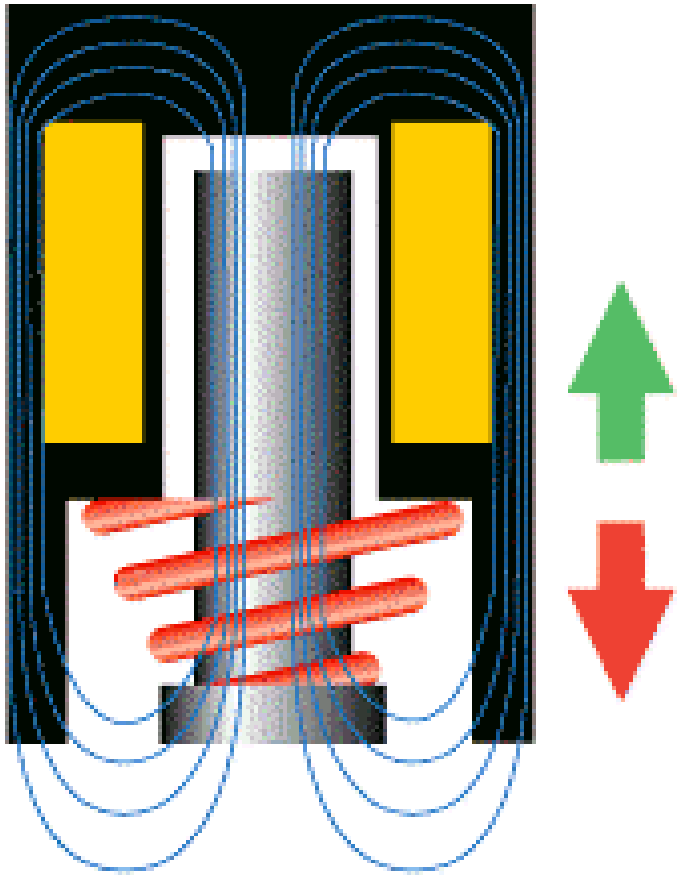


Fig. PA.6a

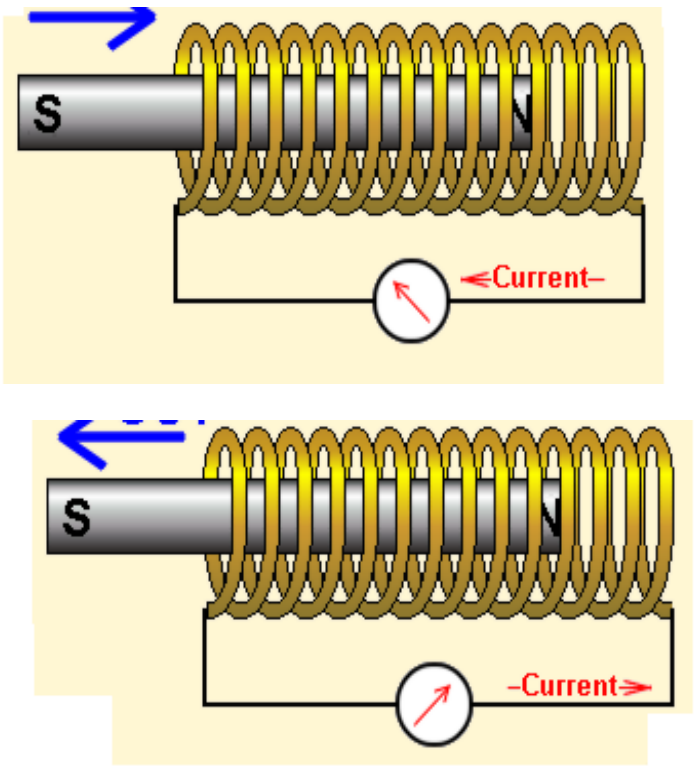


Fig. PA.6b

DK 179141 B1

Figure PA.7

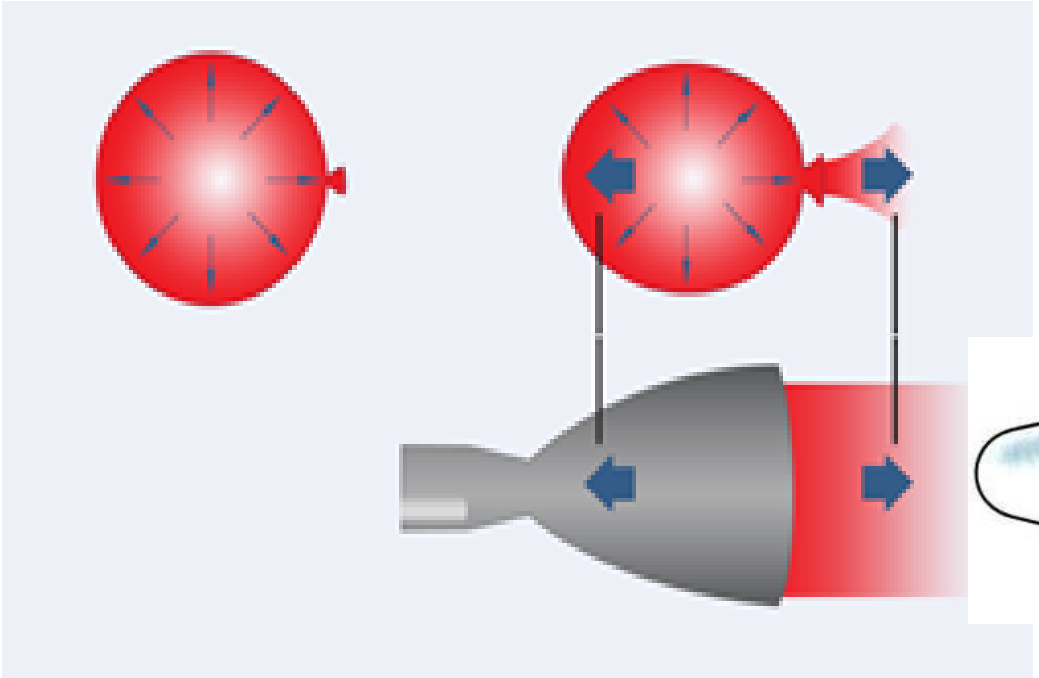


Fig. PA.7a

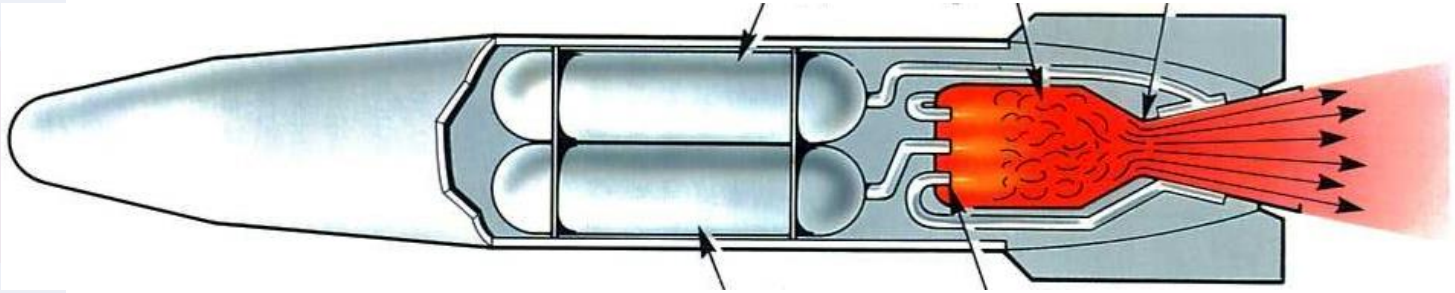


Fig. PA.7b