



PATENTS ACT 1977

APPLICANT	Alexander Scott Ross
ISSUE	Whether patent application GB1900276.5 complies with sections 1(1)(c), 4(1) and 14(3) of the Patents Act 1977
HEARING OFFICER	Ben Buchanan

DECISION

Background

- 1 This decision relates to whether patent application GB1900276.5 complies with sections 1(1)(c) and 4(1); and section 14(3) of the Patents Act 1977 (“the Act”), which relate respectively to industrial application and sufficiency.
- 2 The application was filed on 09 January 2019 and combined search and examination was requested. A brief search found relevant prior art and was truncated prior to completion. As well as the search report, an examination opinion was issued on 08 July 2019 setting out objections to clarity, novelty, inventive step, industrial application and sufficiency. An examination report followed on 29 August 2019 reiterating and expanding on these objections, in particular in light of the broad and unclear claims. The Applicant, Mr Alexander Ross, submitted amendments on 29 June 2020¹. The Examiner issued a further examination report on 10 September 2020, emphasising the apparently fatal objections under industrial application and sufficiency and deferring consideration of other matters including potential added matter in the amendments. The Examiner suggested a hearing to bring the matter to a close and Mr Ross requested one be arranged. The application was subsequently published on 21 October 2020 as GB2583056A.
- 3 The hearing was held on 15 December 2020 with Mr Ross representing himself. Also present were the Examiner Alex Swaffer and my Hearing Assistant Jason Scott.
- 4 Although lack of novelty/inventive step and potential added matter were mentioned in the examination report of 10 September 2020, the hearing was held only to consider the matter of industrial application under sections 1(1)(c) and 4(1) and sufficiency under section 14(3) of the Act. I am grateful to the Examiner for making this clear in

¹ In the intervening period the application had been terminated due to failure to file an abstract in time. The application was subsequently reinstated and the amendments accepted, so this has no bearing on the matter at the hearing.

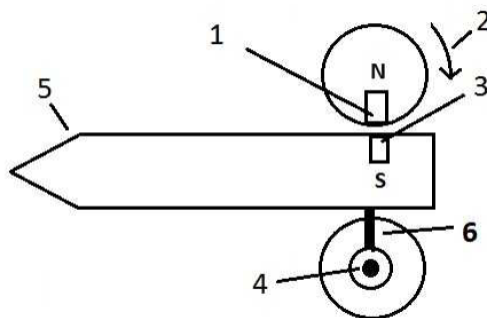
his prehearing report and I reiterated the fact to the Applicant at the outset of the hearing. Should I find in favour of the applicant, the application will be remitted to the Examiner for subsequent examination and consideration of the other objections.

Subject matter

- 5 The claimed invention relates to a system for propelling a space craft. The invention works by using a non-contacting magnetic coupling between a motor-driven wheel with at least one magnet attached to its periphery, and the hull of the space craft, to exert a force on the hull of the craft. The alleged advantage is that by using magnets, without direct mechanical contact between each wheel and the hull, there is no reaction force to the force applied by the magnetic wheel as it rotates (in comparison to, say a rack and pinion, or a frictional force between two contacting surfaces) when used in space. This then, allegedly, means that the craft experiences no resistance to thrust and continuously accelerates while the force is applied. The application was originally titled “Inter Planetary Propulsion System”. On 9th November 2020 the Applicant queried whether changing the title to “Space Propulsion Rotor” would assist its progress. The Examiner advised that it would not, and I agree. The invention is defined by the claims and the title (whilst important) is not relevant for the purposes of the subject matter under consideration.

- 6 It is helpful to understand exactly how the claimed invention is alleged to work, as that is the basis for the objections considered in the hearing. The invention can be understood by reference to the Applicant’s drawings as follows:

Diagram 1

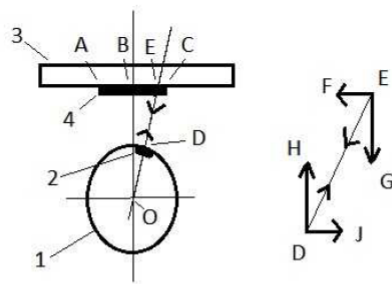


Schematic of Space Rocket Propulsion 1

Key to Schematic Diagram # 1 Space Rocket Propulsion for Type 1 Craft

Item #	Note
1	South Pole of Magnet on Magnetic Wheel. The Magnetic Wheel consists of several magnets equally spaced around its perimeter.
2	Rotational direction of Magnetic Wheel for forward motion of rocket craft.
3	North Pole of Magnet creating attractive force pushing rocket forward. This magnet is part of a set forming a Magnetic Ring around the rocket perimeter and each is aligned with a magnet on the Magnetic Wheel so that they all act in sympathy.
4	The Spindle of the Magnetic Wheel that is driven by a motor.
5	The space rocket fuselage.
6	The Spindle of the Magnetic Wheel is fixed to the rocket

Diagram 12



Key to Schematic Diagram # 12 Vectors Resolution

Item #	Note
A	Start Point of Magnet
B	Mid-Point of Magnet
C	End Point of Magnet
D	Point where the Line of Magnetic Attraction meets Magnet Wheel
E	Point where the Line of Magnetic Attraction meets Hull of Space Ship
O	Centre of Magnet Wheel. If desired bearings here prevent any reaction not rotational and geared ratchet around hub prevent reversal of direction.
1	Magnet Wheel inside Space Ship (rotation anti-clockwise in this example)
2	Magnet on Magnet Wheel
3	Hull of Space Ship
4	Magnet forming part of Magnetic Ring on hull.

- 7 Diagram 1 shows the invention embodied in a space craft with an elongate hull (5). Alternative embodiments include a flying saucer, but the principle of operation, namely the exertion of force by a magnetic wheel on the hull by means of a magnetic coupling with no direct mechanical contact² between the magnetic wheel and the hull is the same. Much as I would like to, I will not consider the other embodiments here. In diagram 1 each motor is mounted externally to the hull and is attached and tethered in place via a spindle 6. The application specifies that the wheels are fitted in pairs, and discussion herein in respect of a single wheel can equally be taken to apply in respect of a pair.
- 8 Diagram 12 shows a vectorised model for the forces applied between the wheel magnet (2) and a magnet (4) on the hull. In diagram 12 the force represented by vector DE is resolved into component vectors DH and DJ on the wheel (1) at the wheel magnet (2) and EF and EG at the point E on the hull where the hull magnet (4) begins. The description as filed alleges that because the wheel is mounted on bearings there can be no reaction force DJ and so the net force EF is applied to the hull causing thrust. In operation, the wheel is caused to rotate by an energy supply and the power thus consumed is repeatedly transmitted to the hull as an allegedly unopposed net force, causing the craft to accelerate in the direction of EF. This allegedly happens because there is no direct mechanical connection between the wheel and the hull, thus reaction force DJ allegedly cannot be exerted on the wheel, and translated via the spindle on the hull (page 14, para 5). The application does not state how the arrangement of magnets can exert a force via the magnetic field in one direction but not the other, other than asserting there is no reaction.

² The applicant uses the term "physical contact" e.g. in original description page 4, paragraph 2. Because magnetic fields fall within the discipline of physics, I have used the term "mechanical coupling" because it more properly conveys the intended meaning.

- 9 Embodiments cover like poles (which repel to exert a force), opposite poles (which attract to exert a force) and switchable poles (e.g. using electromagnets). The principle of operation is the same in all embodiments in that the force exerted is a magnetic force without direct mechanical contact between the wheel and hull.
- 10 In operation, a motor drives each wheel which causes it to rotate. The source of energy may be e.g. solar, chemical or nuclear. It is not relevant to the principle of operation. What is clear is that energy is supplied to each motor to drive it, rotate the wheel and cause magnets on the wheel to apply a magnetic force to the hull of the craft as they move relative to a complimentary magnet attached to the hull.
- 11 The description and other drawings cover options including modular cargo units, detachable rocket stages and artificial gravity units, again effected by means of, or in conjunction with, movement imparted as a result of an applied magnetic force without a direct mechanical coupling. All of these rely on the same principle of operation, which is the one claimed in the application.
- 12 The description provides information about how a space craft which uses the magnetic propulsion system might be launched from the earth to achieve orbit. The propulsion system itself is not claimed to be suitable for this purpose. The description also discusses various alleged advantages of the system and its performance, means to achieve manoeuvrability, stability and so on. Again, in so far as they relate to the claimed invention, they are reliant on the claimed principle of operation.
- 13 The reader is obviously directed to the specification of the application for further details of the alleged principle of operation, but the following bases for this principle are worth highlighting, and effectively outline the way the system is alleged to work:
- “The current difficulty in space is that there is no fabric, mechanism or substance to allow a reactionary force to operate and generate the action or propulsion force” (page 1, para 2)
- “In this situation [space] Newton’s Third Law (that action equals reaction) is not violated but delayed” (page 1, para 7)
- “The system does not create a reactionary force but does provide a base from which an action force is generated” (page 2, para 1)
- “If the system used a gear arrangement instead of the magnetic wheels and a toothed connector instead of the magnetic rings then there would be a reaction force against the motor driving the gear arrangement” (page 4, para 2)
- “The result of this tethering to the wheels is that the action and forward force cannot act in any capacity than to push the spacecraft forward” (page 4, para 3)
- “To ensure that only rotational force operates then, if desired, bearings at the axle of the wheel prevent any reaction not rotational” (page 14, para 7)
- 14 Finally, the claimed invention relies upon the premise that the system:
- “operates in environments that are either gravity free, in space, where Newton’s Third Law can be delayed, missing or is inoperable.” (page 10, para 3)

I have to say it is not clear to me whether the Applicant believes the alleged principle of operation arises because in space there is zero gravity, a vacuum or both. On page 6 para 3 he states:

“If this system is considered in a terrestrial situation it would not work because the fuselage of the craft would be torn from the spindles holding the magnetic wheels. On Earth the fuselage of the craft would meet resistance and have a reaction force but in space there is no resistance apart from any rocks (for example meteors)...”

The claims

15 I sought clarification from the Examiner as to the correct claim set to consider, given the other objections pending. His view was that although the amended claims filed on 29th June 2020 may contain added matter (and thus require some details to be removed) amended claim 1 was prima facie acceptable and acceptably defined the alleged invention (when read in conjunction with the description). The original claims were not structured in an allowable form, and the Applicant agreed he was content that the later claims should be considered. Claims 2-9 present in the amended claim set are drafted in such a manner that they are nominally independent of claim 1, however they are worded as though they are intended to be dependent on claim 1 and I have taken them as such. Claim 1 provides a sound definition of the concept of the invention which is in question, although the wheel and hull being spaced apart (arranged not in direct mechanical contact) is by implication as this is clearly an essential feature when the claim is construed in light of the description.

16 Claim 1 reads:

The Inter Planetary Propulsion System (hereinafter called “the system”) uses one or more engines to provide tangential propulsive force for a space craft by means of pairs of rotating wheels with magnets fixed to the perimeter creating a rotary force that is translated or converted into a linear force on the hull or fuselage of the space craft providing the craft with thrust.

The law

17 The relevant law is defined in sections 1(1)(c), 4(1), and 14(3) of the Act and can be viewed online at the IPO’s website:

The Act: <https://www.gov.uk/guidance/the-patent-act-1977>

18 The Manual of Patent Practice (MoPP) explains the IPO’s practice under the Act and makes helpful references to relevant case law. The Manual can be viewed online at the IPO’s website: <https://www.gov.uk/guidance/manual-of-patent-practice-mopp>

19 In particular, sections 4.05-4.05.2 and 14.67.1-14.70 relating to industrial application and sufficiency respectively are helpful.

20 At section 4.05 MoPP explains that: *Processes or articles alleged to operate in a manner which is clearly contrary to well-established physical laws, such as perpetual motion machines, are regarded as not having industrial application*

21 And at section 4.05.1: *In considering whether an invention operates in a manner which is clearly contrary to well-established physical laws, the examiner should consider the material before them on the balance of probabilities*

Argument and analysis

22 I opened the hearing by requesting the Examiner summarise his objections. The first objection was the lack of industrial application. The Examiner's view was that the system, as described, would not work to provide the space craft with the required net force to effect linear thrust as predicted in the specification. Since the system would not work as described and claimed, it was not capable of industrial application.

23 The second objection was essentially the other side of the same coin. Namely, the invention claims linear thrust is provided, but in the Examiner's opinion the only description of how this happens would not appear to work. Therefore, the specification fails to provide the skilled person with sufficient information to work the invention.

24 I clarified for Mr Ross that the objections are not as to whether or not the components could be manufactured and assembled by an industrial entity, or operated by someone instructed to do so (i.e. "press this button"; "pull that lever"). Neither are they as to whether space travel was an industry and the invention could be marketed. The question is whether the way the invention is claimed to operate is *possible* based on the accepted laws of physics such as Newton's laws and applied mechanics, and whether a person of suitable skill could *make it operate as claimed*.

25 In summary, the objection is not that the claimed invention cannot be built, it is that it will not work as the application alleges. Neither is the objection that the claimed invention gives "free" energy (i.e. a perpetual motion machine). It is quite clear that energy is required to operate it. The objections under sections 1(1)(c) and 4(1); and 14(3), and the issue for the hearing to decide, is whether the arrangement of components claimed will effect movement of a space craft in space because there is no equal and opposite reaction to a magnetic force between each wheel and the hull, which generates linear thrust.

26 The purpose of the hearing was to see whether Mr Ross could provide a convincing explanation of how the application would work successfully based on the information provided in the specification as filed and persuade me on the balance of probabilities that he was right.

27 Mr Ross explained his application. The essential feature was that the wheels did not contact the hull, but applied a magnetic force. This, he asserted, provided the linear force on the hull, producing thrust. He explained that magnets are powerful enough to provide propulsion and recent developments such as the Virgin™ Hyperloop train show that magnets work in a vacuum.

28 I then posed a series of questions to Mr Ross with the aim of understanding how the application is intended to be put into practice and clarifying the physics of exactly how the rotating wheels exert magnetic force on the hull which results in linear thrust. (The questions and responses are summaries of the discussion which took place and are not direct quotations.)

Are the magnetic wheels fixed to the hull of the space craft; can they move relative to the hull other than in rotation?

- 29 Mr Ross stated that the motors for powering the wheels are fixed to the hull, but the magnetic wheels are not directly connected to the hull. In practice the hull is connected via a spindle to the motor and the motor is connected to the wheel such that the wheel is not in direct physical contact with the hull.

In operation, do the wheels move relative to the hull other than in rotation?

- 30 Mr Ross replied: No. The wheels rotate only and do not move because they are fixed to the hull via the motor and spindle.

What would happen if the spindle were not present?

- 31 Mr Ross's response: Without fixing the motor, it would not generate the lateral force to propel the hull; the rotor [wheel] would just float away. If the spindle broke, at the point of breakage the space craft would still move forward, then the wheels would continue to spin rather than move.

If the wheel is physically connected via a spindle, surely any magnetic force applied by the wheel to the hull is constrained by the spindle and a reaction to the magnetic force is translated from the wheel via the spindle? Where does the external force on the space craft as a whole come from?

- 32 Mr Ross explained: The spinning wheel provides the force to the hull. No force is applied to the rotor from the hull via the spindle. The motor provides energy to cause the rotor to spin.

The hull doesn't move relative to the motor; the hull and the motor move together? What force causes the motor to move with the hull? Is this provided by tension in the spindle which causes the motor to move with the hull? Is this not a translated reaction force opposing the force applied by the wheel magnet which you allege causes the hull to move?

- 33 Mr Ross asserted that there was no resistance which would oppose the movement of the hull and motor.

If the wheel pushes on the hull, and the hull pulls on the wheel through the spindle to keep the two connected together, where does a net force arise to propel the space craft?

- 34 Mr Ross again asserted a magnetic force was applied by the wheels to propel the space craft, but did not accept that there was a reaction force translated via the spindle. He claimed that if there were any reactionary force then that would act as a brake.

Doesn't it act as a brake which counteracts the energy from the motor?

- 35 Mr Ross's response was that it is a simple transfer of the magnetic force.

Taking the analogy to magnetic trains on earth³, is the concept not the equivalent of tethering the wheels to the track? The train on earth moves because of an equal and opposite reaction which propels the train. If the train and track are tethered how does it move?

36 Mr Ross responded that the analogy isn't accurate because the track is fixed to the earth. The analogy could be considered similar but opposite, the hull being the equivalent of the track and which moves, though he suggested it isn't completely compatible with a terrestrial situation and the resulting physical effects would be different. I recognise that in Mr Ross's pre-hearing submissions and the description as filed, the analogy with magnetic trains is largely to demonstrate the ability to build devices with spinning magnets which provide motive force. He has been consistent in his assertion that the outcome of applying that force was not analogous in space as on earth.

Do the same laws of physics apply on earth and in space?

37 Yes, replied Mr Ross, but the context is different.

38 In essence, Mr Ross contends that because there is no reactionary force between each wheel and the hull there will be a net force to generate thrust, said thrust causing the hull to accelerate. He alleges that since the motor and wheels are attached via a spindle, they are also caused to accelerate with the hull. If there were any force applied from the hull to the spindle via a reaction, then that would be opposed by the spindle pushing/pulling back on the hull. Even if there were a small amount of tension, the force would be predominantly transferred into linear thrust. Mr Ross then asserted that until someone builds this and tries it, we cannot be sure.

39 Unfortunately, I do not have the resources to build it and try it, so I am obliged to make my decision on the balance of probabilities and on the facts before me.

Newton's laws of motion

40 Newton's laws can be stated as follows⁴:

1. An object at rest will stay at rest, and an object in motion will stay in motion unless acted on by a net external force
2. The rate of change of momentum of a body over time is directly proportional to the force applied and occurs in the same direction as the applied force
3. All forces between two objects exist in equal magnitude and opposite direction ("action" and "reaction")

These laws apply on earth, in space and in a vacuum, although it should be noted that they are inappropriate in certain circumstances, most notably at very small scales, at very high speeds, or in very strong gravitational fields. None of these exceptions apply to a space craft in orbit around the earth and about to commence a journey to Mars, the Milky Way or beyond.

³ Discussed in the application as filed

⁴ https://en.wikipedia.org/wiki/Newton%27s_laws_of_motion

- 41 In making his arguments I believe Mr Ross has misunderstood Newton's laws. I think he has confused the first law, which explains why a space craft will continue in motion in space while unopposed, with the third law which holds true for the space craft as a whole (and in conjunction with the second law explains why it accelerates under thrust and why it slows down when it hits a meteor) and which is also true for any two objects within an internal system of the space craft. He has combined the observation that a space craft will appear to move indefinitely (against no resistance) in a vacuum, with an assumption that this is because a reaction force is delayed, missing or inoperable; and extended this theory to suggest that in the absence of mechanical contact no reaction force will apply between the wheel and the hull in space.
- 42 Mr Ross's position is understandable because space is regarded as a vacuum and objects appear to behave differently compared to on earth. In fact, however, objects obey Newton's laws whether on earth or in space. In a vacuum and in the absence of gravity, a space craft will continue in motion because there is no net external force acting on it (Newton's first law). If there is no net external force such as thrust providing action, there will be no reaction. Newton's third law still applies but there is no action for a reaction to oppose. If thrust is applied e.g. by firing a rocket, there will be an action and reaction between the rocket exhaust particles (which gain momentum in one direction) and the space craft (which gains momentum in the opposite direction). If the space craft collides with another object (e.g. a meteor) a net external force will act upon the space craft causing it to change motion (Newton's first law), the space craft will experience a rate of change of momentum i.e. it will accelerate or decelerate (Newton's second law) and the force exerted by the meteor on the space craft will be opposed by an equal and opposite reaction (Newton's third law).
- 43 Newton's laws each exist and apply all the time, but a reaction force is only absent in the absence of an action, not because the space craft is in a vacuum in space, or because the reaction is delayed. I think Mr Ross has misunderstood this point. It is true that in a vacuum, thrust is not required to overcome air resistance, but that is not the same as there being no reaction to thrust when it is provided. When thrust is provided as a net external force acting on the hull of a space craft in a vacuum, causing it to accelerate, the reaction force is equal and opposite to the rate of change of momentum of the space craft. If the space craft encounters resistance, for example re-entering atmosphere, and the thrust remains the same, the reaction force too is unchanged. However the *net* external force on the space craft is now reduced by the force required to also transfer momentum to the atmospheric particles in the path of the craft, so its acceleration will reduce. But Newton's third law remains; the action and reaction due to constant thrust will remain the same.
- 44 The laws hold true on earth and in space. Apparent differences observed in the behaviour of objects in either environment are in fact explained by the laws being consistent, not by their applying differently in either context.
- 45 Turning back to the invention, an external force is a force acting on the space craft as a whole. Mr Ross asserts that because each wheel is fixed to the hull (via the motor and a spindle) they would move with the space craft as it moves under the influence of an external force. I agree. For this to happen as the craft accelerates, the spindle must exert a force on the motor and wheel to cause them to accelerate

with the hull, and remain attached. I agree with this too. The point of difference is whether the wheel can exert a net force on the space craft as a whole despite being attached to the hull via the spindle, and whether the hull will accelerate under the influence of this force and yet remain attached to the wheel/motor assembly and pull the wheel and motor along with it.

- 46 If the wheels and motors were not tethered to the hull but were fixed instead to a separate external system (for example a space station of which the space craft could move independently) then the space station could apply a net external force to the space craft and cause it to move, and leave the wheels behind. The magnetic force with no mechanical contact between the wheels and hull would cause an action on the space craft and a reaction on the space station. As a consequence, in accordance with Newton's second law, the space station would also gain momentum in the opposite direction (this what Mr Ross refers to a "entropy" on the first page of his application). This is due to Newton's third law causing an equal and opposite reaction in space.
- 47 In my opinion, when arranged such that each wheel and motor is tethered to the hull by a spindle, the application of a net external force by the wheels cannot happen. Without the spindle, in operation, each motor and wheel would separate from the hull under the influence of the action and reaction force as above. With the spindle in place, the action and reaction are still equal and opposite, but they are now within a single system. The force applied by the magnetic wheels of the claimed invention is not an *external* force because the wheels are tethered to the hull by the spindles. The hull, spindles, motors and wheels therefore comprise a system integral with the space craft and cannot apply a net *external* force to the whole system, from *within* that same system. Whether the space craft is in a vacuum or not is immaterial; the wheels cannot apply a net external force.

Newton's second law $F=ma$

- 48 This can also be proved mathematically. Newton's second law can be expressed as $F=ma$ where F is force, m is mass and a is acceleration. It is common ground that in operation the net relative acceleration between the wheel and the hull is zero (i.e. they do not move relative to each other). If the net relative acceleration is zero, for $F=ma$ to hold true the net force between the two must be zero (as both components have mass). In other words, there can be no net force applied by the wheel on the hull and no net external force on the system as a whole because any action is met by an equal and opposite reaction.

Will the magnetic field translate both action and reaction?

- 49 A magnetic field can (and will, because of Newton's third law) translate a magnetic force in two directions, like a spring. When magnets move relative to each other they experience an action and reaction as though connected via a "magnetic spring" even though they are not in mechanical contact. This is just as can be felt between magnets moved in the hand; an opposite force is required to resist attraction or repulsion depending on the polarity of adjacent poles. This means that the reaction force DJ in diagram 12 is exerted as a reaction by the same magnetic field that exists between the hull and the wheel as between the wheel and the hull. This

reaction force is translated from the wheel via the spindle to the hull and opposes the action force of the wheel on the hull.

- 50 Contrary to Mr Ross's assertions about the wheel bearings, they would enable rotation and the motor drive mechanism would in turn translate the reaction force back from the wheel to the spindle, opposing the rotation of the wheel. This is the "brake" Mr Ross referred to in the hearing.
- 51 In summary, the magnetic force exerted by the wheel on the hull is opposed by a reaction force exerted via the same magnetic field back through the wheel, motor drive mechanism and the spindle on the hull. While it is tethered to the hull, the net external force exerted on the system by the wheel is zero and therefore the system cannot generate thrust on the space craft. The application fails to meet the requirement for industrial application because its principle of operation is contrary to well-established physical laws. Because it will not work as intended it also lacks sufficiency.

Other considerations

- 52 Prior to and subsequent to the hearing Mr Ross submitted a number of observations relating to magnetically-propelled trains and rocket powered space craft. His supporting comments were not extensive but I have considered the submissions and I agree that they demonstrate what I believe Mr Ross is trying to show. Namely that magnetic forces can be harnessed in a vacuum to effect propulsion and that external fuelled thrusters mounted via a bracket will work in space.
- 53 On the face of it I am happy to accept both of these assertions, but they do not assist the application. The "Magnetic Hyperloop" systems of the type exemplified by the observations exert a propulsion force between a transport device and a tube or track. Unlike the present claimed invention, the device is free to move in relation to the tube or track (under the influence of a reaction force) and is not tethered to it.
- 54 Mr Ross alleges that the manoeuvring thrusters used in the Apollo space craft evidence that a chemically fired rocket does not experience a cancelling force in space, and therefore does not experience a reaction. This is incorrect. The thrusters operate precisely because of the reaction generated by exhausting material. Acceleration occurs in the opposite direction to the exhaust gas velocity. The conservation of momentum means that the mass and velocity of the exhaust transfers an equal and opposite momentum to the space craft causing it to move. I note that that Mr Ross has specifically relied upon the "RCS Quad" which is a group of four thrusters mounted using brackets to the Apollo space craft to prove his point. Reference to the full document (the Apollo Operations Handbook no less) confirms that "RCS" stands for "Reaction Control System". This is because the system uses the *reaction* force arising from the thrusters to effect the space craft *control system*.

Conclusion

- 55 I have carefully considered the arguments along with the application as a whole and the submissions filed by Mr Ross. The Examiner's objections are grounded in a conventional understanding of well-established physical laws. Mr Ross's submissions do not provide convincing evidence that on the balance of probabilities

a conventional understanding does not apply, or that a person skilled in the art could nonetheless cause the invention to operate as claimed. Therefore, the application does not meet the requirements of sections 1(1)(c), 4(1) and 14(3) of the Act.

56 The application is refused under section 18(3) of the Act.

Appeal

57 Any appeal must be lodged within 28 days after the date of this decision.

Ben Buchanan

Deputy Director, acting for the Comptroller