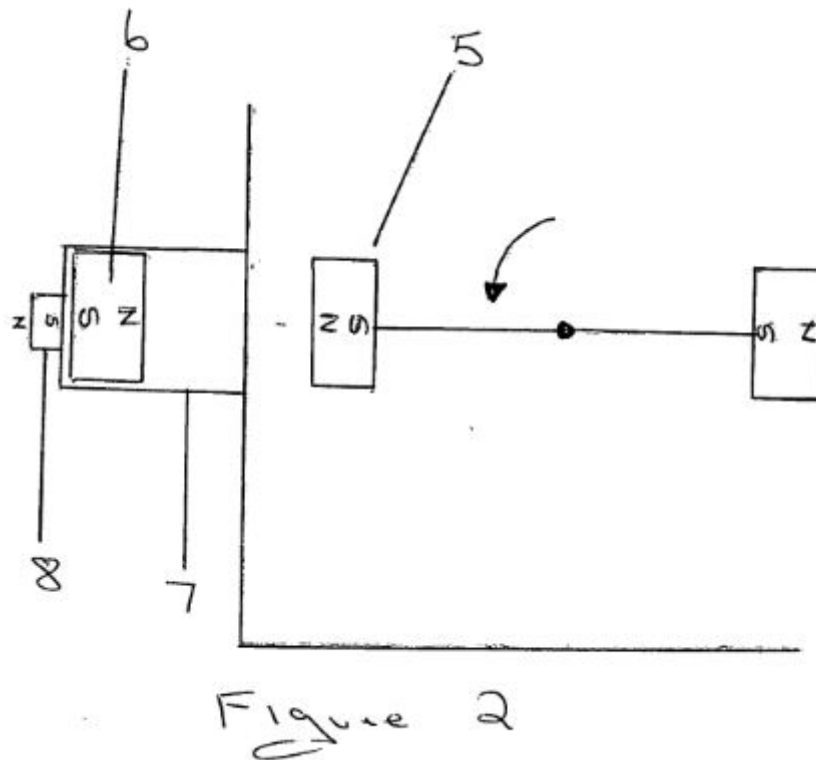


facing. The single use suggested for the device of the invention is space propulsion. As I will consider below, the exact nature of the invention depends on what is meant by “*imbalanced force*” and “*pent up force*”.

- 5 There are three figures showing slightly different embodiments of the invention. Figure 2 appears to show the components of the device most clearly, and is also the closest to the prototype which Mr Hall demonstrated.



The claims

- 6 In a letter dated 31st October 2016 Mr Hall proposed an amendment to originally filed independent claim 1, by which a generally explanatory portion would be appended to the original claim (from “*and as the magnetic mass...*”, see below).
- 7 In an e-mail on 18th January 2017, in the week before the hearing, Mr Hall submitted a further amended claim 1, by which an intended use was added (“*for space propulsion*”, see below), and he asked that I should consider this at the hearing. He also confirmed, in an e-mail of 16th January 2017, that he wanted original dependent claims 2 to 13 to be considered too.
- 8 The latest claim 1 corresponds with that proposed in Mr Hall’s letter dated 31st October with two exceptions: A suitable use for the invention has been defined by the inclusion of the words “*for space propulsion*” in the first line. And, in response to the Examiner’s added matter objection, the words “*in a sideward manner*”, referring to the movement of one magnetic mass towards another, have been deleted from the claim.
- 9 Since I am to consider the added matter objection as raised by the Examiner, the independent claim 1 which Mr Hall and I agreed that I would consider and on which

my decision is based is effectively claim 1 submitted by e-mail on 18th January 2017 but with the deleted words (as mentioned in paragraph 8) reinserted. Claim 1 reads as follows (with those portions which have been added to the originally filed claim 1 being marked with square brackets):

1. A device [for space propulsion] that produces an imbalanced force by moving one mass having magnetic properties or plurality of masses having magnetic properties into the repelling magnetic field of another mass having magnetic properties or plurality of magnetic masses where the magnetic polarity of such masses having magnetic properties where facing each other are the same and so repelling in force and in such a manner as to move the magnetic mass or magnetic masses towards, across and away from the other magnetic mass or magnetic masses [and as the magnetic mass or magnetic masses are moved toward the other magnetic mass or magnetic masses [in a sideward manner] the repelling effect of the magnetic field will increase as the distance decreases due to the momentum of the moving magnetic mass or magnetic masses producing a pent up force this pent up force can then be utilized by suddenly taking away one of the repelling magnetic fields producing a brief moment of force imbalance to one of the magnetic masses or plurality of magnetic masses].

10 Other claims against which the Examiner has raised objections, or upon which I asked Mr Hall to comment at the hearing, are also noted below in whole or in part (with my emphasis added):

2. A device according to claim 1 that enables a magnetic mass to move towards, across and away from a magnetic mass that is in a fixed position...

5. A device according to claim 1 that enables a magnetic mass to move towards, across and away from a magnetic mass of repelling magnetic orientation.

9. A device according to claim 1 where the moving magnetic mass is electromagnetic...

10. A device according to claim 1 where the magnetic mass being in a fixed position and being electromagnetic...

11. A device according to claim 1 where a magnetic mass is rotated towards and begins to move away from a fixed magnetic mass before travelling across the fixed magnetic mass.

12. A device according to claim 1, a means of power for moving a magnetic mass or plurality of magnetic masses towards, across and away from another magnetic mass or plurality of magnetic masses.

13. A device according to claim 1 that is so constructed as to be rotatably mounted so as to be able to change the direction of the resultant imbalanced force.

Issues to be decided

- 11 The main issues to be decided are: whether the claims are clear and concise, as required by section 14(5)(b); and whether the invention is capable of industrial application, as required by section 1(1)(c).
- 12 Several other objections were identified in the pre-hearing letter of 14th November 2016. Depending on how I decide the above issues, I will also need to determine: whether the amendments result in the application disclosing matter extending beyond that disclosed in the application as filed, as prohibited by section 76(2); whether the invention is new, as required by section 1(1)(a); and whether the claims are supported by the description, as required by section 14(5)(c).

The law

- 13 The law regarding these is set out in sections 1, 2, 4, 14 and 76 of the Patents Act 1977 as follows:

Section 1(1)

A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –

(a) the invention is new;

(b) ...

(c) it is capable of industrial application;

...

Section 2(1)

An invention shall be taken to be new if it does not form part of the state of the art.

...

Section 4(1)

An invention shall be taken to be capable of industrial application if it can be made or used in any kind of industry, including agriculture.

Section 14(3)

The specification of an application shall disclose the invention in a manner which is clear enough and complete enough for the invention to be performed by a person skilled in the art.

Section 14(5)

The claim or claims shall –

(a) ...

(b) be clear and concise;

(c) be supported by the description; and

...

Section 76(2)

No amendment of an application for a patent shall be allowed under section 15A(6), 18(3) or 19(1) if it results in the application disclosing matter extending beyond that disclosed in the application as filed.

Analysis

Clarity – s.14(5)(b)

- 14 I will consider the clarity of the claims first, because until it has been determined what is meant by each of the terms used in the claims, it cannot be determined what the invention defined by those claims is; and until it has been determined exactly what the claimed invention is, it cannot be determined whether that invention is capable of industrial application, or is supported, or is novel.
- 15 At the hearing I asked Mr Hall to define for me what he meant by each of several terms which he has used in his claims or in his description. I am grateful to him for clearly explaining to me what meaning he had intended to convey in each case. Whilst I do not doubt that the meanings he explained to me are those which he always intended should be conveyed by those terms, that does not necessarily mean that the meaning of those terms are clear within the claims as required under the terms of the Act. To meet this requirement each claim, when read having regard to what has been described in the description, should have a single and unambiguous meaning.
- 16 If the meaning of a term used in the claim is not clear, but the intended meaning of that term is something clearly described or defined in the description, then the term in the claim may be amended and clarified using wording taken from the description. But, if the meaning of a term used in the claims cannot be understood by something described in the description, then that term is unclear and there is not support in the description to allow any clarifying amendment. And, if the meaning of a term used in the claims may be understood with reference to the description, but it defines

something which is impossible to do or make, then even if the claim could be made clear the invention it defined would not be capable of industrial application.

- 17 Mr Hall defined an *“imbalanced force”* or *“internal imbalanced force”* as a *“resultant force”* or a *“force which produces movement”*. However, nowhere in the description is the term *“resultant force”* used (or any obvious equivalent), and nowhere is the *“imbalanced force”* described in those terms (though there is a reference in claim 13 to changing the direction of *“the resultant imbalanced force”*). The Examiner has raised the objection in each of his examination reports that *“it is not clear what the imbalanced force is, what form it takes, or how the force is generated”*. Mr Hall responded to that objection at some length in his letter dated 5th October 2016, though without stating that an *“imbalanced force”* is simply a *“resultant force”*. Whilst I can see that the claims make sense if *“imbalanced force”* is read as *“resultant force”*, it is not clear from the specification that it could or should be understood that way.
- 18 Mr Hall had more difficulty in explaining to me what it is that *“creates”* or *“produces an imbalanced force”*. He discussed producing the *“imbalanced force”* with reference to magnetic forces which were *“repelling, but not repelling”*. He went on to say that this has to do with converting electrical energy into movement. I think that this aspect of the invention has to do with a phenomenon which Mr Hall has observed in the prototype for his invention, but which he acknowledges that he does not fully understand. The problem is that it is not clear from the claims not just what produces this *“imbalanced force”*, but what the skilled person must do or make in order for it to be produced.
- 19 With regard to the *“pent up force”* which increases as the repelling force of the magnets increases as the distance between them decreases, Mr Hall said that this was indicated by the number of small arrows numbered 3 in figure 1. As I understood his explanation, the *“pent up force”* is the repulsive force exerted by each magnet on the other. However, it appears to me that the claim presents it as something produced by that repulsive force, rather than corresponding with it.
- 20 Regarding *“suddenly taking away one of the repelling magnetic fields”* or the force being *“suddenly moved away”*, Mr Hall said that this could be achieved by switching off an electromagnet. He later indicated that the *“sudden”* removal was seen when one magnet was rotated past and then away from the other. Again, I am not satisfied that what is meant by this term is clear within the claims or the description.
- 21 Perhaps of most significance in terms of understanding the nature of the invention, when I asked Mr Hall what moved the one magnetic mass *“towards, across and away from”* the other magnetic mass, and whether this movement was under the action of the rotor (of the motor), he confirmed that it was. In his examination reports the Examiner has objected that *“it is not clear how two magnetic objects with the same polarity facing each other... can move towards (or across) each other”*, and concluded that *“the only reasonable outcome is that the two objects move away from each other”*. In his response to this point in his letter of 5th October 2016 Mr Hall stated that *“no mention is made in claim 1 as to how the devise is to be rotated”*. I believe that Mr Hall's explanation to me resolves one of the points of disagreement between him and the Examiner. Mr Hall is not claiming that the one magnet will move *“towards”* or *“across”* the other magnet due to any magnetic force between them (which he acknowledges to be a repulsive force), the magnet is moved by an external force (the

motor) which is not defined in the claim. Unfortunately this leaves the problem that neither the motor, nor any equivalent means of movement, is defined in the claims or described anywhere in the specification. With the benefit of Mr Hall's explanation, and having observed the prototype in operation, I can now clearly understand how the one magnetic mass can move towards and across the other, but this is not clear in the claim.

- 22 With Mr Hall's assistance I now have a clearer understanding of how the device of his invention may be constructed and how it will operate. But the requirement under law is that the claims of the patent application must be clear; that is, that the invention must be understandable from the claims, either reading them alone or in the context of the description. Regrettably the meanings of certain terms used in independent claim 1 are not clear in the context of the claim, and there is no supporting portion of the description which provides a clearer definition of these aspects which could be incorporated into the claims.
- 23 Therefore I must conclude that claim 1 is not clear as to what is meant by: *"produces an imbalanced force"*, *"in such a manner as to move... towards, across and away from"*, *"producing a pent up force"* and *"suddenly taking away"*. And that there is no support in the description to allow any amendment of the claim to make the meanings of these terms clear.
- 24 Further, claim 1 defines the invention in terms of *"a device... that produces an imbalanced force by moving one mass having magnetic properties... into the repelling magnetic field of another mass... where the magnetic polarity of such masses... are the same and so repelling in force and in such a manner as to move the magnetic mass... towards, across and away from the other magnetic mass"* (my emphasis added). Now that Mr Hall has explained his invention to me I can see that the reference in the claim to moving the one magnetic mass *"towards, across and away from"* the other mass is intended to expand on the earlier reference to moving that first mass *"into the repelling magnetic field"* of the other mass. So, in both cases the *"moving"* is the same, and is performed by an external force, *i.e.* the motor, and not by any magnetic force between the magnetic masses. However, whilst that may be understood with the benefit of Mr Hall's explanation, in my opinion it would not necessarily be understood from the claim itself.
- 25 An intelligent and careful reader of the whole specification might reasonably construe claim 1 as suggesting that the movement of the one magnetic mass *"towards, across and away from"* the other magnetic mass is under the action of forces produced by initially moving that first magnetic mass into the repelling magnetic field of the other. Indeed, since nowhere in the specification is the reader told what produces any movement other than the device having the components defined in claim 1, and claim 1 defines that the *"device... produces... by moving"* (my emphasis), such a reader might reasonably construe claim 1 as suggesting that the initial movement of one magnetic mass into the repelling field of another is somehow performed by the device itself. A skilled person would understand that a device so defined would effectively be a perpetual motion machine, and that its operation would be contrary to the laws of physics, and so it would be impossible to actually build it, but it would not be clear to that person that that is not what the claim is intended to define.

26 Thus the omission from claim 1 of the motor, or any equivalent means of producing movement, leaves the whole meaning of the claim in doubt. And since there is no reference anywhere in the specification to a motor, there is no support to allow an amendment to claim 1 to clarify that the movement is produced by a motor.

Industrial application – s.1(1)(c)

27 Whether the invention is capable of industrial application, that is whether it can be made or used, and the related matter of whether the specification of the application discloses the invention in a manner which is clear and complete enough for the invention to be performed by a skilled person, are best considered with reference to the prototype. Mr Hall has constructed the prototype generally in accordance with the invention described in the specification, with some important exceptions, which I will come to.

28 Mr Hall brought the prototype device with him to the hearing, and described and demonstrated it for me. It worked reasonably consistently as he had described to me that it would. I was given every opportunity to examine the prototype, and Mr Hall fully answered all of my questions regarding its construction and operation. Mr Hall was not able to explain to me, in terms of the laws of physics, exactly why the prototype behaved as it did in every aspect. Indeed he gave the impression that he suspected that the observed motion was in some regards contrary to what might be predicted or explained using those generally accepted laws. Having viewed the prototype working, I am convinced that the motion of each component of it at each stage of its operation was altogether in conformity with the universal laws of physics. But it is not necessary for Mr Hall, or for me, to be able to explain why the prototype behaved as it did to acknowledge that there was indeed movement of the prototype device which might be described generally using the terminology of claim 1. In the circumstances I would not expect Mr Hall to offer a complete theoretical explanation as to precisely how the device performed as it did.

29 The prototype was not exactly the same as any of the embodiments of the invention shown in the figures. More significantly, the prototype included components which are evidently essential for its operation, but which are not described or shown in the description or figures, and are not defined in any of the claims. Some of the differences between the prototype and the figures may be regarded as unimportant, inasmuch as the prototype adequately exhibited certain characteristics of the invention. However, that essential components of the invention are omitted from the patent application does matter, as this precludes the grant of a patent for a device which includes those components.

30 The prototype device had similarities with the device shown in figure 2, but it had four rotating arms rather than two. And the magnets borne by each arm were free to move within tubes towards and away from the centre of rotation rather than being fixed at the end of each arm. And a single magnet mounted on the support was fixed rather than being free to move away from the passing magnets on the rotating arms. The arrangement of the magnets in the prototype was thus in some ways the inverse of figure 2, with four of device 7, each with corresponding magnets 6, mounted as rotating arms, and one magnet 5 fixed on the support. In the prototype arrangement, as each magnet 6 was rotated towards fixed magnet 5 that magnet 6 was repelled towards the centre of rotation. A significant difference was that there was no need for a magnet 8

to return each magnet 6 to its original position, since centrifugal force acted to return each magnet 6 to the end of its respective rotating arm.

- 31 The prototype device was further distinguished from that of figure 2 in that the “L” shaped support device was itself mounted (either on a bearing or by being suspended with string) such that it was free to rotate about a point generally in line with the motor and the centre of rotation of the rotating arms. So that the support upon which magnet 5 was mounted was free to rotate either with or counter to the rotating arms.
- 32 The essential distinction between the prototype and the figure, however, was that in the prototype the rotating arms were mounted on and rotated by a motor. The motor being itself mounted on the “L” shaped supporting device.
- 33 In operation, when the motor was powered on, the rotating arms began to rotate, and as each magnet 6 passed magnet 5 it was seen to be repelled towards the centre of rotation, and then to return to the end of its rotating arm after it had passed. The rotation was not smooth, with perceptible slowing and accelerating as each arm approached and passed the fixed magnet 5. The supporting device did not rotate, but neither was it perfectly stationary. Each time the motor was started the supporting device began a rotational movement counter to the rotation of the motor, and then returned in the direction of the motor, and it continued to generally oscillate back and forth while the motor was running, each movement being less than a quarter of a full rotation. There was some other, erratic movement of the whole device also taking place, as might be expected with a reasonably heavy object (a couple of kilograms), comprising spinning parts with moving masses, being suspended by a length of string. This other movement is not relevant to the operation of the invention.
- 34 When the motor was powered off and the rotating arms ceased to rotate, so long as this was done at the right moment, there was a brief but significant rotational movement of the support device in the direction in which the rotating arms had been travelling.
- 35 Mr Hall stated that his invention is based on this phenomenon, that there is the movement of the supporting device after the power to the motor has been switched off, and hence, evidently, a force acting on the magnet 5 fixed upon the support. He also suggested that his invention is based on the phenomenon that the supporting device does not rotate counter to the rotation of the motor and the rotating arms (though, as I noted, there is an initial movement in that direction).
- 36 Without needing to enter into any argument as to what causes either of these two phenomena, they cannot be observed without providing some rotatable mounting means for the support device and without the motor which drives the rotating arms. Neither of these is defined in any of the claims. Nor is either of these presented elsewhere in the specification, so that the claims cannot be amended to incorporate them.
- 37 I must conclude therefore that the specification of the application is not sufficiently complete that a skilled person, having read it, would know all of the components which were needed, or exactly what to do, in order to make and to operate the device of the invention.

- 38 Further to this, a skilled person reading the specification and viewing the figures would be able to construct something which would be similar in some aspects to the invention as Mr Hall described and demonstrated with his prototype. But because (as I have discussed above) it is not quite clear from the claims or the specification exactly what the invention comprises, then the invention of the patent application (the invention defined by the claims, as distinct from the invention demonstrated by the prototype) is not something which could be made. If a device were to be constructed in accordance with what is disclosed in the patent specification only, having no rotational mount for the support and no motor, then it would not operate in the manner of the invention demonstrated by Mr Hall using his prototype, and the phenomenon which he says is the basis of his invention would not be seen.
- 39 The claim 1 under consideration defines the device as being "*for space propulsion*". Indeed the only suggested use of the invention in the description is that it "*would be especially useful in space propulsion*". However, the invention as presented throughout the specification is a device comprising different magnetic masses which move rotationally relative to each other always within the confines of the device itself. Although figure 3 is presented as showing "*linear movement*" of a magnet, there is nothing to show how the device could operate other than with rotational movement. When I asked Mr Hall about this aspect of figure 3, he said that figure 3 was a different view of the same device as is shown in figure 2, and that the movement was not actually linear. There is nothing in the application to indicate how the device as a whole could move at all. Even allowing for the free support demonstrated in the prototype, the movement of the whole device is also essentially only rotational. There is nothing to suggest that the device, or any part of it, may be propelled away from its original location, so nothing to support any application in propulsion in my opinion.
- 40 When I asked Mr Hall how the invention could practically be used for space propulsion he was only able to suggest that skilled persons (such as those employed by NASA) would be able to utilise his invention in that application. Whether or not that is true, the specification does not show how the invention could be utilised for space propulsion. No practical use of the invention is described or is apparent from the specification, and therefore the invention is not one which could be used in industry.
- 41 Having found that the claim 1 under consideration is not clear and that no saving amendment is available, and that the invention is not capable of industrial application and that the specification is not sufficient for the invention to be performed, it is not really necessary for me to determine the other matters. But for completeness I will comment on them briefly.

Added matter – s.76(2)

- 42 The Examiner objected that including a reference in claim 1 to one magnetic mass being moved towards the other "*in a sideward manner*" would constitute added matter. As noted above, in his e-mail of 18th January 2017 Mr Hall proposed removing this term from his claim. However, from figures 1 and 2 it is clear what is intended by this term: as the magnet on the rotating arm moves in its rotation closer to the fixed magnet it may be described as moving towards it "*in a sideward manner*". In the description the term "*in a sideward manner*" has already been used similarly to describe the repelling effect between two magnetic masses. The use of this term does not add anything not in the original specification, and it would therefore be allowable.

Conciseness – s.14(5)(b)

- 43 The Examiner objected to claim 5 on the basis that it defined only a feature already defined in claim 1. The objection stated that this is “*not concise*”, but, perhaps confusingly for the Applicant, the objection was listed under the heading of “*Clarity and support*”. In his letters Mr Hall questioned how the feature defined in claim 5 could be “*clear and yet unclear*”. The answer is that the claim is clear, but the unnecessary repetition of the feature is not concise. The same clause of the Act requires claims to be “*clear and concise*”. Claim 5 does repeat aspects of the invention already defined in claim 1, and it therefore lacks conciseness.

Support – s.14(5)(c)

- 44 The Examiner also objected to claims 9 and 10 as lacking support in the description, since they define the use of electromagnets which are not mentioned in the description. The objection is valid, but, as the Examiner noted, it could be easily overcome by simply incorporating into the description the wording of these claims.

Novelty – s.1(1)(a)

- 45 In assessing the novelty of the invention the Examiner has construed the invention as defining just “*two magnets which repel each other*”. As considered above, due to the lack of clarity of the independent claim it cannot be determined exactly what the scope of the invention is. But it is more than just two magnets repelling each other. None of the cited documents disclose a device quite like that of this application. The device witnessed differs from the cited examples, but I note that the search has not been completed and cannot be, due to the lack of clarity of the claims.

Conclusion

- 46 As discussed above, I find claim 1 as considered not to be clear as required by section 14(5)(b) and the invention not to be capable of industrial application as required by section 1(1)(c). There is no support in the original specification to allow amendments to be made to overcome these objections. The application is therefore refused under section 18(3) of the Patents Act.

Appeal

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

C L DAVIES

Deputy Director, acting for the Comptroller