

Free-energy ? Not From "Lutec": Pt 2

Patents and Free Energy

Ian Bryce concludes his investigation of a "free energy" claim, and finds it wanting.



Ian Bryce doesn't need to be a rocket scientist to conduct his investigations. Nevertheless, he is one, as well as being an engineer and member of the NSW Committee.

Two inventors from Cairns have been promoting investment in their "Lutec Free Energy Machine" around the world. In the first Part we looked at their elaborate promotion and business activities, designed to separate investors from their money. We carefully analysed the power measurements on which they based their claim of 30 times more output than input, and showed the real efficiency is far less than unity (ie, no free energy).

In Part 2 we continue to report the investigation, focusing on the elaborate system of patents which featured so visibly in the promoters' material. We also give a layman's guide to energy theory, so readers will be better equipped to assess or advise others on the myriad of energy claims used in marketing both legitimate and doubtful products.

Significance of Patents

For any invention which the inventor hopes will earn money, first he must take steps in order to protect it from being exploited by a copycat or pirate manufacturer. There are two ways to do this: for military technology, it is usually kept secret, which requires strict enforcement and severely limits the customer base. For commer-

cial devices intended for sale to the public, secrecy is not an option, and instead, patents are used to establish ownership of the key idea or innovation, and thus prevent unauthorised manufacture or usage. A potential investor will usually expect to see a patent or registered design, in order to protect his investment.

In the current case, the inventors have gone to great lengths to associate their patent to their marketing effort, as noted in Part1. We were not surprised to see, on the B.A.N.K. website, the declaration:

Christie and Brits ... are the owners and inventors of a new technology expressed in an international patent application number PCT/AU99/00962. This invention has been applied to develop a device for generating electricity at no cost of fuel to run and without producing any pollution.

There are many steps involved in patenting; it always extends over many years and costs tens of thousands of dollars. Thus, if we can examine the patent paper trail, we can expect it to reveal the inventors' key technology, what it achieves, how they think it works, and a time-line

of their technical and business activities.

In the case of inventions which are not in accordance with known physical laws, such as free energy machines, the inventors' claims are liable to change in response to adverse criticism. Then the patent is often very revealing about what was in the inventors' minds at that time, showing particularly their belief of how the device works.

As Brits and Christie advertised widely for investors, both family and corporate, their progress might be of interest to many people who have invested money or are considering doing so. Some knowledge of the patenting process and what to look for might also assist others considering investing in the multitude of other opportunities out there. It might also help Skeptical investigators to ask the right questions. Thus I will report on it in some detail.

Time-line

The patent application process is notoriously long, complex and expensive. The paper trail for the Lutec invention indicates the following steps:

1. In Australia:

* The Provisional Specification No PP6961 was filed in Australia on 06/11/98 by Intellpro, patent attorneys of Brisbane, Australia, and listed as the inventors Brits and Christie. In general a Provisional sets the priority date, important in the case of a dispute over who was first. It also starts a time-line specifying when other stages must be performed by. Provisionals are usually short and simple, often written by the inventor himself; thus it may be useful in showing the inventor's thoughts at this early date.

* The Complete Specification was filed in Australia on 04/11/99. It was prepared by patent attorneys Griffith Hack of Brisbane. In general, a lot of effort is made to ensure the Complete must be legally correct. It must also describe what is

useful and novel about the invention.

* Both Specifications became Open for Public Inspection (OPI) in Australia on 29/05/00. This means the public can then see them after that date. Some entrepreneurs scan **all** patents as they become OPI, hoping to find a valuable new invention and be the first to licence and market it (or perhaps to pirate it, if so inclined).

* Christie and Brits' Australian patent application has not yet been "examined", so is not yet "granted".

2. In the World:

Under the Patent Co-operation Treaty (PCT), one application covers 92 countries, and, in effect, buys another 12 months before entering the National Phase.

* Brits and Christie lodged under PCT on 04/11/99.

* An International Search was completed on 25/11/99. Its purpose is to find the closest previous patents (it listed four). The Search does not make judgements on whether it will actually work or meet its stated purpose.

* An International Preliminary Examination was due 3/01. Mr Carew told me that this took place, and it was examined and approved as claiming novel and inventive subject matter.

3. In Specific

Countries (National Phase): This means filing in individual countries other than the country of origin (Australia).

* Deadline for filing was 22/05/01. This deadline calls for hard decisions, as each country costs a small fortune in attorney, application, examination and annual fees. I understand they filed in several countries, but I have been unable to locate the applications in searches, they may not have been processed yet. Usually, the most popular countries are USA, Europe (one applica-

tion cover many countries) and Japan.

Description of the Patent

The Provisional Specification was titled "A Rotary Electric Converter And Controller Therefor". The description is very similar to the Complete Specification, which is addressed below. The PCT patent application may be seen at <http://l2.espacenet.com/dips/viewer?and> subsequent links.

The Australian Complete Specification was filed at the same time and is probably identical. It lists the inventors as Ludwig Brits and John Christie, of Cairns in northern Queensland, Australia. It was drafted by Mr Cliff Carew, a partner of Griffith Hack. I thought his comment would be useful.

Abstract

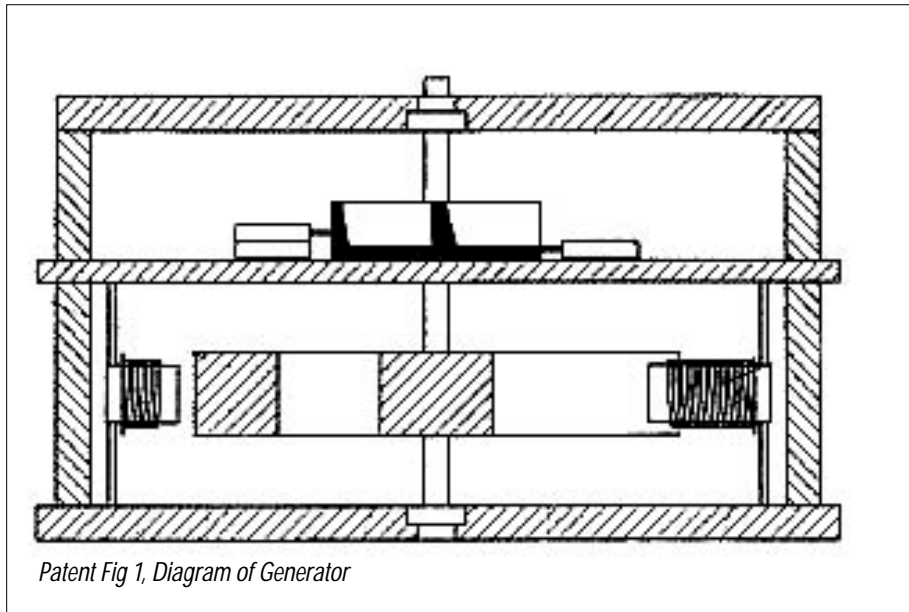
The abstract reads:

A system for controlling a rotatable device, the system comprising a controller and a rotary device, which has a stator and rotor, wherein the controller is connected to the rotary device to control rotation of the rotary device, and wherein the controller is adapted to periodically energise [energise?] at least one energising coil of the device to create a magnetic field of a polarity which induces the rotor to rotate in a single direction and wherein the controller is switched off so as to de-energise the energising coil when other forces, being forces other than those resulting from the energised energising, coil produce a resultant force which induces rotation of the rotor in the single direction.

The detail in the patent describes, in the simplest implementation, a rotating machine with permanent magnets on the rotor, and electromagnets (iron cores with electric coils) on the stator (fixed part) (Fig 1 lower half).

A switching system driven by the shaft (upper half) provides current from an external battery into the coils, thus producing a torque and turning the shaft. So far this is the same as many common DC motors.

Free energy?



Patent Fig 1, Diagram of Generator

The Patent and the Free Energy Claim

We saw that the inventors closely associate this patent with investment in their free energy machine. Is this reflected in the patent itself?

* The Provisional of November 1998 makes no free energy claim, only listing the purpose as "to improve the efficiency".

* Mr Cliff Carew, the attorney who drafted the patent in November 1999, told me that the inventors presented him with the central idea of using a timing switch to control electrical energy. In his opinion, it is a valid method of improving the efficiency of an electric motor.

They did, however, claim that it produces free energy, and he stressed to them that perpetual motion is impossible.

* The patent text is very quiet on free energy, but pages 15 and 22 list among possible variations:

The output produced by the rotary device can be mechanical and electrical at the same time... Current generated in the stator coil windings can be used as an output and likewise the torque generated by the rotor can be used to supply a mechanical output.

* When I put this to Mr Carew, he responded that this is meant in the same way that a car alternator may,

at the one time, put out electrical energy (via the terminals) and mechanical energy (eg to its cooling fan).

* My difficulty with this interpretation is that a car alternator has a third interface: a shaft driven by a belt, which undoubtedly puts in energy. In contrast, the machine described in the patent has only has two connections to the outside world, electrical to these stator coil windings, and mechanical to the one shaft, so there is no possibility of energy input at a third interface. This is confirmed in a letter from John Christie (4 Jan 01):

By reconfiguring the coil, we can pump power back to the battery source, which then hold or even increases in charge level as the motor runs.

So there can be both electrical and mechanical output (as distinct from input) at the same time. This indicates that the inventors intended the patent to support claims of free energy and perpetual motion.

More recently, the inventors' web sites and media statements show that they are relying heavily on the patent application to support their business claims for generating free energy (refer to above and Part One of this article).

The Aspect of Critical Timing of the Electric Current

Putting aside the claim of free energy, does the patent contain any substance of value? The patent details describe at great length a special switch which provides, to the electromagnet, electric pulses of specific timing and duration. It shows a commutator with conductors that are tapered, in order to fine tune the pulse duration by adjusting the brushes vertically. The writer apparently believed that by applying current just long enough to overcome the natural magnetic attraction between the rotor's permanent magnets and the coil's iron cores, and then removing the current, more energy can be produced than is expected. John Christie has described this to the media, by web site, and to me.

Based on my experience as an electrical engineer, I see many flaws in the claim that this switch is novel or effective in improving efficiency:

* Variable timing can be obtained electronically with ease, so this adds nothing new.

* More amusingly, the writers do not seem to realise that in breaking the battery-electromagnet circuit instantly, the inductance will cause the current to keep flowing. In fact, copious arcing is very visible in their video of the device running! This wastes energy and will quickly erode the contacts.

* They believe this timing is especially critical, as the switches are to be closed for precisely 12 degrees 51 minutes and 50 seconds of angle! (They could not possibly measure to this accuracy, so mathematicians among our readers might like to reverse engineer this figure to see what theory predicts it.)

Interestingly, the Provisional Patent a year earlier listed:

typically 16 degrees 30 minutes of arc, the pulse being applied at 20 to 40 minutes of arc beyond a predetermined position...

* They believe this special timing makes the generator more efficient,

to the point of producing greater output than input.

The patent description includes a diagram of waveforms (see next column), but I cannot understand it. On seeing my comments, Mr Cliff Carew responded:

The idea of combining an alternator with an electric motor by using a timing switch to control electrical energy fed to the overall system seems to be a viable proposition and is the one which is covered in the patent specification.

Interesting, then, that the inventors are vigorously promoting it *only* as a free-energy machine, and its **real** efficiency is about 33%.

Other Errors

The patent contains errors of spelling, grammar, and figures not referenced. For those readers with some electrical knowledge, the following should be of interest:

* Page 3 states "... the back EMF urges the rotor to rotate ...". Actually a back EMF provides no force unless there is a circuit to allow current to flow. Page 19 repeats the mistake "... repulsion produced by the back EMF ...".

* Figure 7, showing input voltage vs input current, and Fig 8, showing natural magnetic attraction, etc, do not make sense from an engineering point of view.

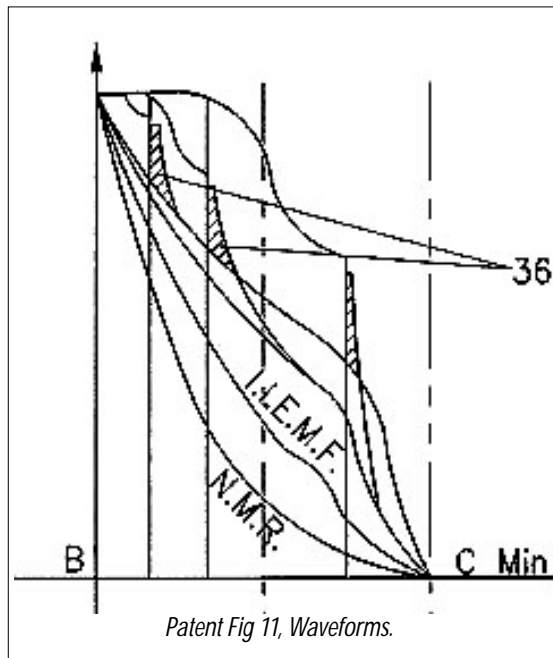
* The writer of the patent believes that continuity of forward force is essential. He states that the coil should be energised at the moment the resultant of other forces becomes opposing (p. 3), and should be de-energised at the moment that other forces become assisting (p. 2). Without this, the rotor will not be able to spin continuously (p. 11). This belief ignores the inertia (fly-wheel effect) of the rotor.

* A real engineering description of a motor would include analysis of ampere-turns, magnetic reluctance, air gap flux and the like. This patent instead contains confused ideas like

"natural magnetic attraction", "induced induction", and "ratios per second".

* The magnetic force is referred to as the "mug force" (Fig 5). (A Freudian slip perhaps, referring to investors?)

* There are many irrelevant digressions. Page 13 expounds that the coils may be wound from copper, silver, aluminium or other metals. The shape of the winding wire may be round, square, triangular, rectangular and others, and so on. In fact, the magnetising force of a coil is simply the number of turns of wire, multiplied by the current flowing; the choice of metal and the shape



are irrelevant to the principle of operation.

Mr Cliff Carew responded that my criticisms are just "wrong interpretations placed on wording that has been used". My view is that the patent documentation shows a lack of sound knowledge of mechanical and electrical principles.

Can Patent Perpetual Motion Machines be Patented?

It is often reported that, in the USA, you cannot patent perpetual motion machines. This is due to a Statute for Prohibition if the patent violates the laws of nature. The Australian Com-

missioner for Patents, Ms Vivienne Thoms, advised me that Australia has no such Statute, so that the Government examiner cannot use that basis to reject a patent. However, the applicant must describe how it works, and give the best method for performing the invention. If the patent is later challenged in court, and the plaintiff shows that it violates the laws of nature, then the court will accept that the invention cannot work, and will not be useful. This is grounds for revocation of the patent..

Will Attorneys cater to Perpetual Motion Machine inventors?

I posed this question to Mr Cliff Carew of Griffith Hack, who drafted this patent. He wrote that he understood it as a valid method of controlling a machine, which provides improved efficiency.

I believe in the laws of physics, and that there is no such thing as a perpetual motion machine and I have made this clear to both John and Lou.

In any case, based on other patents I have seen around the world, it is clear that there are some patent attorneys who are willing to draft and file patent applications which violate the laws of nature. Their staff (if competent) must know that the subject device will never work, yet they proceed to charge fees to the applicant. They could claim that they are supplying a service which the applicant desires, and so there is no victim. Skeptics would argue that this often indirectly results in investors being cheated out of their savings. The ethics of the situation need to be investigated.

Comparison with Other Perpetual Motion Machines

Patents for perpetual motion machines cover a wide span of complexity. My collection includes the following:

* The most fundamental such machine I have seen was a German

Free energy?

patent showing a car motor containing eccentric weights on a shaft, the arm length varying with rotation angle. This scheme is re-invented periodically, such as in an Australian bicycle where the pedal arms are lengthened during the down-stroke. A rudimentary education in mechanics would reveal that this principle cannot produce free energy or improved efficiency.

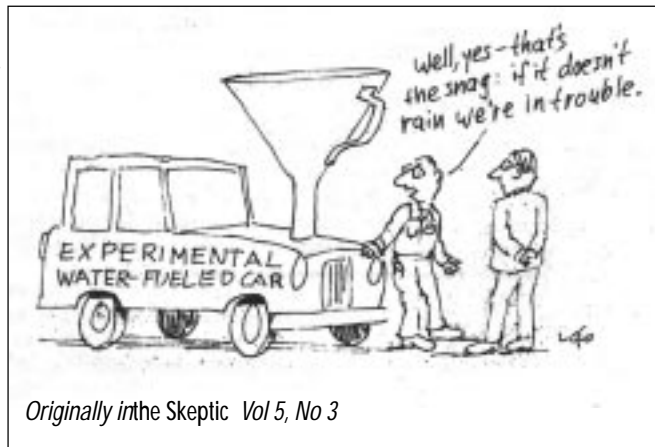
* Of similar simplicity, but employing magnets, a device I saw at an exhibition consisted of two concentric aluminium cooking pots, the inner one (the rotor) free to spin on bearings. The inventors had glued magnets on the facing surfaces of the pots. When they gave the rotor a spin by hand, it lurched encouragingly. Even at the exhibition, they were desperately rearranging the magnets, in the naive belief that, once they found the right pattern, it would continue accelerating.

* The Lutec machine is more complex being electromagnetic, but nevertheless the theory and practice is well-known. The Lutec patent contains no X-ray generators, cold fusion cells, or other high-tech devices which could gain access to exotic energy sources.

* Further up the complexity scale, I investigated the water-powered fusion car of Steven Horvath of Brisbane, (*the Skeptic* 3:4 - now available on the *Great Skeptic CD*). His patent contained high-tech gizmos like an X-ray generator to ionise the incoming gases, thus (he claimed) making energy available for combustion. The then Premier, Joh Bjelke-Petersen, openly supported it, greatly to the amusement of his many critics. In order to analyse its technical claims, Australian Skeptics employed some advanced physics; the *Skeptic* article exposed it as a fraud.

* The most complex perpetual motion machine I have personally investigated is arguably the monster machine which included shaft power,

electricity generation, heated gases, oscillating pistons, and mechanical rectification by ratchet. It cost a fortune to make, but, to the immense puzzlement of the inventors (who were skilled Italian technicians), it refused to run.



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Why can't Free Energy Machines work?

This section reflects my many attempts to explain some basic physics to proponents of perpetual motion machines. I address it to the many I have argued with, to those proponents who may chance to read this, and to Skeptics in dealing with such inventors they may come across.

Energy exchanges on Different Scales

There is a quantity called energy, which matter can possess in many forms, including:

- * Gravitational (more when a mass is high);
- * Kinetic (when a mass is moving fast);
- * Heat (more when the material is hot);
- * Chemical (more when a material has the power to burn or go bang);
- * Electrical (carried by current, and stored in electric fields);
- * Magnetic (stored in magnetic fields);
- * Nuclear (when an atom's nucleus undergoes fission or fusion).

The basic laws of physics are very well established; that is why we can

successfully design jumbo jets and cell phones. The most fundamental laws describe the forces and motions (interactions) of elementary particles.

The laws show that in every interaction, *without exception*, the energy given up by one particle is transferred to another particle. This is

equivalent to saying that in this basic interaction, the total energy is constant. This has been verified in a billion experiments, in classrooms and laboratories around the world. All scientists and a majority of members of the human race accept it.

When the particles are grouped together to form atoms and molecules, many of the fundamental interactions can be grouped together. There come into play higher-level interactions and laws (for example the field of chemistry). A chemical reaction can be regarded as summations of fundamental interactions. Thus, the total energy should be conserved, and indeed measurements and practice confirm it. When bulk materials are fashioned into a machine, the laws can be further coalesced into so-called macroscopic laws, which take into account the averaged properties of the materials. An example might make this clear: consider a rotating electromagnetic machine connected to a battery. Engineers design and test such systems every day.

Interactions include:

- * Mechanical forces between two parts (due to physical contact, eg, bearings);
- * Inertia (energy stored in the moving parts);
- * Chemical to electrical (electrolyte and electrodes in battery generate current);
- * Electrical to magnetic field (eg, current flowing from battery to coil of electromagnet);
- * Magnetic fields (eg, surrounding permanent magnets);

* Magnetic to mechanical (eg, magnetic field generates torque urging rotor to rotate);

* Magnetic to electric (eg, moving magnet in generator produces EMF (voltage) in a coil);

* Electrical to heat (eg, coil heats up).

When such a motor or generator system runs, what do we find about the energy now? With so many exchanges, surely there is opportunity for new phenomena? Many free energy proponents believe (or at least claim) that by carefully fashioning the magnets, coils, pole pieces, etc (or the equivalents in their field), they can create more output than input.

Sorry, both the theory and the experiment are again unanimous: **the total energy is conserved.**

Analogy with the Economy

Sometimes I try to explain by analogy. Consider two people with coins in their pocket. In an interaction, say A gives B \$5 (in exchange for a bag of apples), then anyone can see that A has \$5 less and B has \$5 more, and the total money held by the pair is unchanged. This is the same idea as exchanging energy in an interaction between two elementary particles.

Now consider a payment from one company (group of people) to another. The payment can be regarded as the combination of many elementary transactions, and the company payment is the summation of the individual transactions. It follows that money is conserved also at the larger scale.

Finally, consider transferring money among a set of companies; will this break the conservation law? Alan Bond tried this; his round-robins of loans and borrowings appeared designed to generate money out of thin air. He could not, or would not, see that the total money is constant.

Most people can see that, no matter how complex the purchases and payments, they are merely a summation of more basic interactions and there can be no "net gain". I hope that readers in doubt can see that

the workings of machines is analogous to the economy.

Energy is conserved at the lowest level, and through summation it follows that it is also conserved at the highest level. The law of conservation of energy is also known as the first law of thermodynamics.

A Primer in Power and Energy

When confronted with claims of energy-saving devices etc, it is useful to be able to tell fact from bull-dust. Knowledge of some terms and units might be a help.

Power is measured in *watts*. A light bulb consumes around 100 watts of electricity, and a car engine might produce 110 kilowatts of mechanical power at its output shaft.

Energy is the power totalled over a certain time interval, and is measured in *joules*, one joule being one watt for one second. Our electricity bill charges us for electric energy in kilowatt-hours (kWh), and our gas bill charges us for the chemical energy which is available as heat output, in megajoules (MJ). A calorie in food is about 4.18 joules of chemical energy available to our metabolism.

The first law of thermodynamics simply states that energy is conserved, ie, may be converted between forms but may not be created or destroyed. There is also a second law of thermodynamics, which states that in any transfer of energy in a machine, some is wasted as heat. This means that if we put in say 100 watts of electric power into a motor, we can only get less than 100 watts out as useful shaft power. The ratio is called the **efficiency**.

Machine designers have been striving for hundreds of years to make their machines more efficient. Consider car engines, batteries for mobile phones, power stations, aluminium refineries. Any designer who can gain 1% in efficiency for their process (say from 91% to 92%) is doing their job well.

The above comments address common energy sources such as chemical, electrical, magnetic, and mechanical. There are some exotic energy sources which should be men-

tioned for completeness. If an inventor claims his engine runs on:

* Nuclear fission (eg, from uranium);

* Nuclear fusion (eg, Horvath car and cold fusion);

* Antimatter;

* Quantum fluctuations;

* Zero-point energy;

* Wormholes;

* The electromagnetic aether;

then we cannot immediately dismiss their claims on the basis of conservation of energy alone. A deeper analysis (usually by a specialist) is called for, and in many cases we find that the claim does not ultimately make sense because the inventor's technical knowledge was deficient or feigned, as was the case for the Horvath hydrogen fusion car.

Conclusion

Australian Skeptics (and their counterparts around the world) will continue to investigate claims of free energy, from both the theoretical and measurement points of view. We will keep an open mind on each case until the evidence is in.

Meanwhile, we can categorically say to such free energy proponents that, according to the laws of physics, their machines can not work. All measurements to date have confirmed this. Thus, such claims are based on false premises, and fall under the description of scams. To seek money or advantage from them, risks being labelled fraudulent.

To people considering investing in such schemes, we suggest you say to the promoters "Australian Skeptics say it is impossible; have you accepted their challenge?"

