Re: "Can the Second Law of Thermodynamics Be Circumvented?"

Source: http://sci.tech−archive.net/Archive/sci.physics/2006−04/msg01961.html

- *From*: Marshall Dudley <mdudley@xxxxxxxxxxxxx>
- *Date*: Fri, 14 Apr 2006 14:25:02 −0400

Yes it can, and can be done easily. The experimental device to do this can be built easily for under $20 and uses a variation of Maxwell's Pressure Demon to extract electric energy directly from the random motion of molecules of room temperature air. The output of such a device was computed, and when the device was built and tested it was found that the output fell within +/− 2 1/2% of the theoretical output over the range of 20 to 55 C despite increasing by over a factor of 5 over that range. There is absolutely no power input to the device other than the random motion of air molecules.

The device is nothing more than two pieces of metal brought very close together. One has a 1 atom thick layer of insulation on it, and the other one does not. Electrons of the outer shell of air molecules tunnel through this layer when a molecule bounces off the insulating layer (aided by collision induced tunneling), and become trapped in the plate. The molecule which has lost an electron eventually finds its way to the other sheet of metal, and becomes neutralized, but not before losing the energy deposited on the other plate due to moving against a voltage gradient between the plates. The result is a cooling of the air between the plates and a voltage difference between the plates which can produce small amounts of current.

This information was published in Infinite Energy Magazine issue 66 last month (http://www.infinite−energy.com/iemagazine/issue66/index.html). A prepublication copy of the paper is at http://www.execonn.com/maxwell/maxwells_demon.html

Marshall

Teg wrote:

> "Can the Second Law of Thermodynamics Be Circumvented?"
>
> The validity of the First and Second Laws of Thermodynamics seems to be beyond question. Under the first law, the total energy content of a closed system must remain constant. Under the second law, the availability of that energy for useful purposes must always decrease or remain constant. In effect, the First Law of Thermodynamics states that you can't win and the Second Law states that, furthermore, you can't break even. The First Law of Thermodynamics is unquestionably true, energy can neither be created nor

destroyed, General Relativity not withstanding. The Second Law of Thermodynamics stands on less firm ground because it is a law based upon statistics. As such, it is in the same category as an actuarial table. An insurance company can predict quite accurately how many people will die in a given year. They cannot predict who those people will be. Statistical laws are valid for large numbers of events; they become less significant as the number of events is reduced. As an example, if one patronizes a casino, he might initially win a large sum of money playing a slot machine, but if he continues to play he not only will give all his winnings back to the casino, he will sustain a significant loss. The
question then arises as to whether it is possible to by−pass the Second Law of Thermodynamics though the use of nanomachines. (A nanomachine is a mechanism whose significant dimensions are measured in nanometers, the size scale of atoms.)

One who observes Brownian motion in a microscope might reasonably conclude that, in principle at least, a nanomachine could be built which would bypass the Second Law of Thermodynamics. When a liquid containing microscopic particles is observed, the particles are seen to be in continuous (Brownian) motion. That motion is caused by random thermal impacts between the molecules of the liquid and the particles. If the thermal motion of water molecules can produce a visibly observable motion in particles which are at least 10^15 times as massive, it certainly not unreasonable to believe that suitable nanomachines could organize the effect to produce a useful mechanical output. The postulated nanomachines would then be able to export energy to the outside environment that it obtained by reducing the temperature of the liquid. The exported energy would be converted to heat and raise the temperature of the external environment as the output performed useful work. The resultant temperature difference between the environment and the liquid will then cause the energy which had done useful work to flow back into the liquid to return it to its original temperature and allows the process to continue indefinitely.

James Clark Maxwell proposed a hypothetical perpetual motion machine, known as Maxwell's Demon, which was not proven to be theoretically unworkable for 75 years. In that machine, Maxwell imagined that a demon controlled a microscopic gate between two gas filled chambers. Making use of the fact that, in a gas, the velocity of the molecules is random and that the temperature of the gas is determined by the mean velocity of those molecules, Maxwell proposed the concept that, if an appropriate demon existed, he could sense the speed of molecules approaching the gate and open the gate only when a fast molecule approached it from one side or when a slow molecule approached it from the other side. By operating the gate in this manner, the demon would sort the molecules so that one chamber contained fast molecules and the other chamber contained slow molecules. Since the temperature of a gas is determined by the mean velocity of its molecules, such a process will maintain a temperature difference between the chambers that can be exploited to produce useful work in a direct violation of the Second Law of Thermodynamics. It took 75 years before a rigorous proof was found which was able to show that the energy required for Maxwell's Demon to identify the fast and slow molecules and allow the gate

to operate was at least as great as the energy that could be released and Maxwell's Demon was shown to be an unworkable concept.

There is a modification to the concept of Maxwell's Demon for which there is, at least as yet, no valid theoretical objection. Suppose that the two chambers of the Maxwell's Demon example no longer rely on a demon but are separated by a diffusion membrane having a permeability from side A to side B which is higher than the permeability from side B to side A, as shown in http://einsteinhoax.com/cf153.gif. The energy required to allow the membrane to make the decisions it needs to make in order for it to function in this manner is available in the kinetic energy of the gas molecules passing through it. In diffusing through the membrane, molecules can provide the energy needed by being slowed from their average room temperature velocity of about 1300 feet per second to a much lower exit velocity. The lower velocity of the gas leaving the membrane means that side B is colder than the ambient temperature. The loss of kinetic energy by the molecules as they pass though membrane provides the energy required to operate the differential diffusion mechanism in the membrane pores, and the membrane becomes warmer than the ambient temperature. If the surface areas are sufficiently large, the temperature of the gas on both sides of the membrane and of the membrane itself must remain close to the temperature of the environment. As a result, the pressure in chamber B will be higher than the pressure in chamber A. That difference in pressure can be used to operate a turbine and provide useful output power. As the gas flowing through the turbine produces output power, the chambers are cooled below the ambient temperature and energy flows from the environment to the chambers to replace the energy delivered by the turbine. The arrangement would extract useful energy from its environment in direct contradiction to the Second Law of Thermodynamics.

Conceptually, the membrane might be constructed with pores that were covered by spring−loaded trapdoors, as shown in http://einsteinhoax.com/cf154.gif. In this illustration, a molecule represented by a ball approaches the right side of the membrane at a velocity, which was appropriate to its temperature, knock the trapdoor open, and pass through it. A similar molecule approaching the trapdoor from the left side would bounce back and not pass through to the right side. When the molecule on the right passed through the trapdoor, it would lose most of its kinetic energy to the trapdoor and exit at a low velocity. As a result, the trapdoor and the membrane would be heated and the molecule which passed though it would be cooled. The process would generate a local temperature difference that would quickly be equalized by any reasonable level of heat transfer.

The first theoretical objection to this type of perpetual motion machine that the author has found in literature is that it cannot work because it violates the Second Law of Thermodynamics. This is hardly a valid objection since the arrangement is specifically designed to bypass the limitations of that law. The Second Law of Thermodynamics is a statistical law and it is not binding on nanomachinery since such mechanisms deal with molecules on an individual basis and the pores of the assumed diffusion

membranes certainly qualify as nanomechanisms. (The Second Law of Thermodynamics, or the Law of Entropy increase if you prefer, does apply to the membrane itself and to the gas in the chambers since they involve large numbers of randomly interacting
particles. It does not apply to the pores of the diffusion mechanism. Each pore is an independently acting nanomechanism and, as such, is not bound by the Second Law of Thermodynamics (Entropy). The only other theoretical objection that the author has found was provided in another book by Dr. Feynmann in which he described a nanomechanism consisting of a riverboat type of paddle wheel mounted on a shaft inside a cylinder containing a fluid. The paddle wheel was
bombarded by the random motion of the molecules of the fluid and caused the shaft undergo a random rotary oscillation. To convert this motion to a useful output, an EXTERNAL one−way ratchet was attached to the shaft. Dr. Feynmann then demonstrated that the device would not work because the motion of the ratchet pawl would generate enough heat so that the resultant thermal molecular motion of the ratchet and pawl would make the pawl bounce sufficiently to render the one way mechanism inoperative.

From the description provided, it is obvious that, while Dr. Feynmann is undoubtedly an excellent theoretical physicist, he is not as effective as a design engineer. Relocating the ratchet mechanism to the interior of the fluid chamber must cool it close to the temperature of the fluid and dampen its bounce. As a result, Dr. Feynmann's objections would vanish. When the model is modified, Dr. Feynmann probably would be forced to agree, that unless he could devise another objection, the concept should represent a physically realizable device that would by−pass the Second Law of Thermodynamics. A theoretical demonstration that the mechanism suggested by the author cannot work requires a proof that the permeability of all possible diffusion membranes must be the same in both directions. Deriving such a proof may be particularly difficult because the pores of the required membrane are allowed to extract energy from the molecules that pass though them. CONSIDERABLE EFFORT IS JUSTIFIED IN DEVELOPING SUCH A PROOF. IF THAT
PROOF CANNOT FOUND, THE POSSIBILITY OF BUILDING A PERPETUAL MOTION MACHINE
OF THE SECOND KIND IS NOT FOOLISH AND AN ALL OUT EFFORT TO DEMONSTRATE IT IS
JUSTIFIED. IF IT CAN BE BUILT, SOCIETY WOULD HAVE AN INEXHAUSTIBLE A AND
POLLUTION FREE SOURCE OF ENERGY THAT PROBABLY COULD BE SIZED FOR THE
SMALLEST HOMES AND THE LARGEST FACTORIES.

Please do not bombard the writer with the foolish objection that the proposed mechanism can't work because it would violate the Second Law of Thermodynamics, it is designed to do just that, and please don't raise the objection that it can't work because the overall entropy of the Universe can

never be decreased. In this regard, the proposed mechanism is entropy neutral.

The source material for this posting may be found in http://einsteinhoax.com/hoax.htm/ (1997); http://einsteinhoax.com/gravity.htm (1987); and http://einsteinhoax.com/relcor.htm (1997). EVERYTHING WHICH WE ACCEPT AS TRUE MUST BE CONSISTENT WITH EVERYTHING ELSE WE HAVE ACCEPTED AS TRUE, IT MUST BE CONSISTENT WITH ALL OBSERVATIONS, AND IT MUST BE MATHEMATICALLY VIABLE. PRESENT TEACHINGS DO NOT ALWAYS MEET THIS REQUIREMENT. THE WORLD IS ENTITLED TO A HIGHER STANDARD OF WORKMANSHIP FROM THOSE IT HAS GRANTED WORLD CLASS STATUS.

All of the Newsposts made by this site may be viewed at http://einsteinhoax.com/postinglog.htm.

Please make any response via E−mail as Newsgroups are not monitored on a regular basis. Objective responses will be treated with the same courtesy as they are presented. To prevent the wastage of time on both of our parts, please do not raise objections that are not related to material that you have read at the Website. This posting is merely a summary.

E−mail:− einsteinhoax@xxxxxxxx If you wish a reply, be sure that your mail reception is not blocked.

The material at the Website has been posted continuously for over 8 years. In that time THERE HAVE BEEN NO OBJECTIVE REBUTTALS OF ANY OF THE MATERIAL PRESENTED. There have only been hand waving arguments by individuals who have mindlessly accepted the prevailing wisdom without questioning it. If anyone provides a significant rebuttal that cannot be objectively answered, the material at the Website will be withdrawn. Challenges to date have revealed only the responder's inadequacy with one exception for which a correction was provided.

.