FIRST ATTEMPT TO BUILD THE PROTOTYPE

In 2017 I perfected an overunity magnet motor that I call the magnetic energy transducer (MET). That same year I analyzed the MET design using the magnetostatic solver in Ansys Maxwell. The solver calculated the cogging torque, but I thought it calculated the moving/motoring torque. Later that year a German professor picked interest in the MET design. The following year, he built two modified versions of the design. One of the prototypes had 25 oblique magnets; the other one had 50 oblique magnets. None of the prototypes worked. The professor then sent me an email describing the behavior of the prototypes. Here's the content of the email:

"Yesterday we tried out the finished construction with only 15 magnets preliminary. We then added the missing ones, expecting that this will not give us a qualitative change.

The result is that there is no autonomous motion. There is a sticking force between magnets and steel rotor so that turning the rotor by had requires a certain force (although there is no mechanical contact between magnets and rotor; the airgap is about 0.2mm). This force is probably created by temporary magnetization of the steel ring. When the ring moves ahead, the "magnetic image moment" has to move through the material which requires a significant force. For a test we magnetized the ring a bit at one place. Then the force for moving it was even greater. We will do the last tests on Friday but we think that there will not be a better result with a stator fully filled with magnets."

After reading the email, I downloaded the Ansys Maxwell user's guide/manual and studied it. The manual made me to understand that the magnetostatic solver only calculated the cogging/detent torque; and that to calculate the moving/motoring torque, I would have to use the transient solver. (The magnetostatic solver solves the Maxwell's equations in the spatial domain, while the transient solver solves the equations in the time domain.)

To test the efficacy of the transient solver, I used it to analyze five permanent-magnet-motor prototypes that aren't working; for each prototype, the transient solver calculated zero moving torque. Here are the links to the results of the analysis of the five permanent-magnet motors:

https://www.linkedin.com/post/edit/wang-shenhe-magnetic-motor-simon-olanipekun

https://www.linkedin.com/post/edit/calculating-dynamic-torque-simon-olanipekun

https://www.linkedin.com/post/edit/denis-magnet-motor-built-2018-simon-olanipekun

https://www.linkedin.com/post/edit/abdulkareem-overunity-motor-simon-olanipekun

https://www.linkedin.com/post/edit/third-prototype-simon-olanipekun

I then used the transient solver to analyze the two prototypes that the professor built. The results of the analysis are shown in FIGURES 33D – 33N and 58D – 58N.

In a mail dated July 7th, 2018, the professor wrote:

"When I move the oblique magnets instead of the iron rotor (this is only possible by hand), I experience the same behavior; there is a slow down of motion like in a viscous fluid. For principle reason, it cannot make a difference if the rotor or stator is actually rotated."

FIGURES 33D and 58D show the torque output of the prototypes' models. FIGURES 33E and 58E show the speed output; while FIGURES 33F and 58F show the displacements. FIGURES 33G - 33H and FIGURES 58G – 58H show the behavior of the two models when their rotors are each given a push of 300 rpm. As shown, the rotors come to rest in a very short time; these results are in agreement with the professor's findings. When I sent FIGURES 33D, 33E, 58D, and 58E to the professor, he replied me on September 20th, 2018, with a mail saying:

"So we have at least conformity between experiment and theory now. During construction of the device, we tried it out with a few magnets first but there was no torque too. Moving the rotor by hand, you can feel that the damping is very strong."

And when I sent him FIGURES 33G - 33H and 58G – 58H, he replied me saying:

"Your calculation may be realistic concerning the stopping time. When we built the device, we first tried it out with about half the number of magnets; there was no difference. The device stopped. It did not depend on the number of magnets."

From series of analysis carried out on the MET design, I discovered that the MET uses these two factors to produce non-conservative magnetic fields:

(1) The shape of magnets; and
(2) The airgap length between the magnets.

FIGURES 1 to 56 show the various airgap lengths that produce conservative and non-conservative magnetic fields. The forward magnetomotive force (mmf) of the MET is dependent on the above two factors. Whether the forward mmf is greater than, or lesser than, or equal to, the back mmf; depends on the airgap length between the oblique magnets.

Now according to FIGURES 1 – 56, the two prototypes the professor built will only work if, and only if, the professor adjusts the number of the oblique magnets to either 40, or 30, or 24, or 20, or 16, or 15, or 12, or 10. I shared this information with the professor; and on January 12th, 2019, he sent me a mail saying:

"The current prototype cannot be changed; it would require a new construction of the aluminum carrier of the magnets. Using a ferrite ring would be desirable. Such large rings are not available. One would need customized segments and glue them together. Producing such customized ring segments will be quite expensive."