Tapping High Altitude Wind

'Ladder' of Kites Viewed as Energy Source

A former Dutch astronaut with the euphonious name of Wubbo J. Ockels has come up with an unusual, even unlikely, wind energy invention. Best described as a looped kite "ladder" in the sky, Dr. Ockels' inspiration is to use the stiff breezes at high altitudes as an energy source.

His series of kites, or alternatively tethered wings, connected in train to a cable forming a huge loop would serve to produce electricity on the ground by having the kite line pass through a generator. Such a device would be both cost effective and environmentally correct. That's the theory.

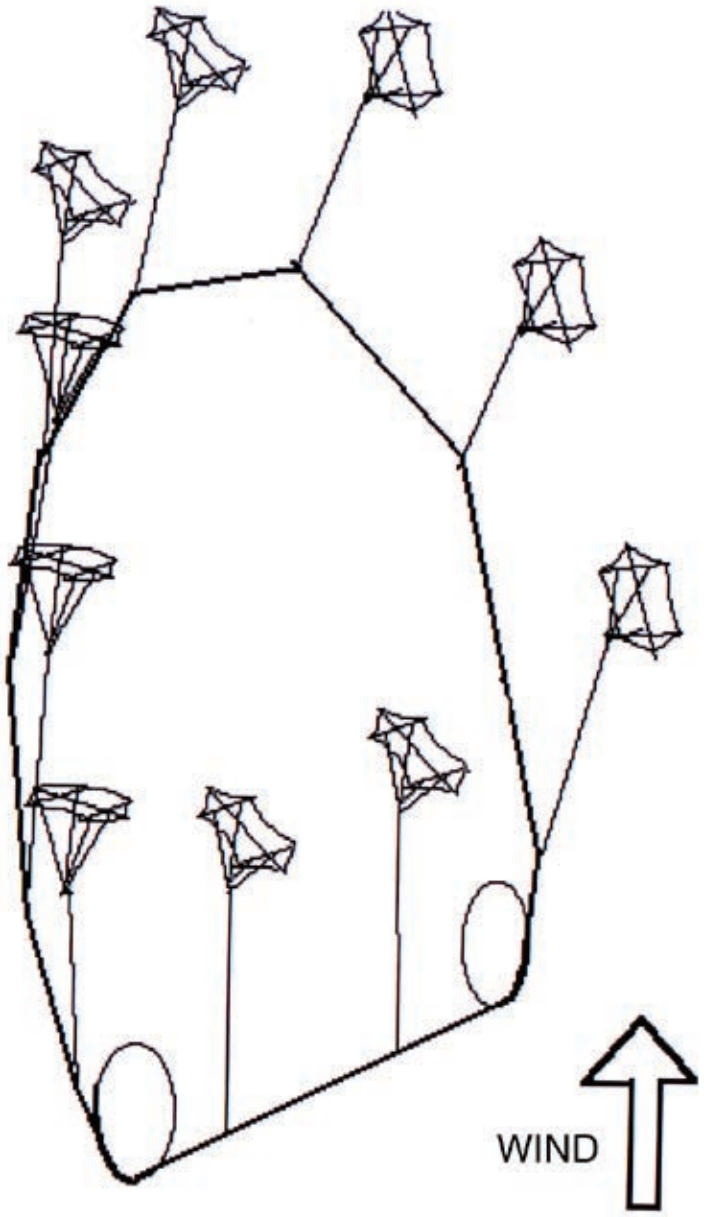
Ockels, 55, who made two trips into space as an astronaut, is now an aerospace professor at the Delft University of Technology and head of the European Space Agency's educational outreach office. He says he conceived his invention, patented in the U.S. under the name Laddermill, because of high altitude kite flying he did as a boy, when he had to enlist his parents to help him reel in the powerful kites he made and flew. His experiences as a pilot of light aircraft and of gliders reinforced his notions on the potential of wind power.

Ockels conceives of his kite loops flying to altitudes of 29,000 feet, with sensors on each kite permitting individual flight to be adjusted to changing weather conditions. The kite would do this by radioing data to a computer on the ground, which would then relay flying orders back to the kite. As they revolved back to the ground, the slowly moving kites would be detached and transferred to the upward-heading line in a manner similar to the method used with ski cable cars.

Flying would be done in a zone where aircraft were banned, similar to the large area along the U.S.-Mexican border where high-flying balloons with radar are used to interdict drug traffic. Working closely with weather forecasters, operators of the system would bring down the kites when needed.

Ockels envisions 100s of his installations, each requiring some four hundred 10-by-27-foot kites, as capable of generating enough electricity to supply the needs of a city the size of Seattle, and this at a cost comparable to polluting fossil fuels.

Grandiose, complicated, and costly as the project sounds, and is, Ockels envisions a simple prototype to begin with. Required would be two capstans, six kites, and some cable. The rig would be flown to an altitude of 1,000 feet. Sensors would be attached to the kites to regulate their angle of attack to the wind, and thus their pulling power, both going upwards and downwards. The rig would be launched by balloon, which would detach and return to earth. If this project, costing maybe $25,000, worked well, the matter could be taken further. Expensive technical studies would begin.



How the kite "ladder" might look

David Lang, of Seattle, a former NASA expert and now aerospace consultant, is Ockels' point man in the U.S. Lang's expertise was objects tethered in space. Now he is enlarging his view to include objects tethered to the earth.

Lang submits four interesting questions for skeptics of the Ockels concept: Do you doubt the wind velocity figures provided each day on the Web by the National Oceanic and Atmospheric Administration? Do you doubt there is enough power available in high altitude winds to supply all the energy needs of the U.S.? Do you doubt the ability of the industry to make apparatus capable of capturing the power available from this wind safely and as economically as fossil fuels? Would you have doubts about devoting a very small portion of the air space in the U.S. to flying this apparatus?

Lang concludes: If the answer to any of the above queries is "yes," would you be willing to try and support that position in detail, and debate it?

Rising to the challenge, Scott Skinner, president of the Drachen Foundation, who has studied technical material on the subject, queries operations at the top of the kite loop. "How will angle of attack be changed? What will be the cost if every wing can sense angle of attack and have the computer machinery to change it automatically? Must the downward flying (and upward ones as well) wings be changing their angles of attack constantly, due to changes in wind at various altitudes? What effect will this have on their tethers and their internal controls."

"Maybe because as a kiteflier I have learned that what can go wrong will go wrong," Skinner continues, "I wonder about what happens if the line breaks. It appears the assumption made is that the kites will still fly in an upright and stable position. What if they, for example, turn 180 degrees to the wind and fly downwind and actually accelerate in speed to the ground? What if one, two, or three flip over on the way down---now they are increasing speed downward with every meter? Aren't they?"

Ali Fujino, administrator of the Drachen Foundation, thinks the correct way to view the project is as a "dream or vision that may lead to innovative inventions. Both Dr. Ockels and Dave Lang are highly credible scientists, and their idea should be studied carefully. The point is, really, kites remain viable in modern technology, as this project shows."

Lang responds: "This is the kind of dialogue Dr. Ockels and I welcome." Ockels can be contacted at wubbo.ockels@worldonline.nl and Lang at ddlang@cypressmail.net. Have at it!

Patents, Trademarks and Copyrights

By Ed Grauel

If you want to protect your new idea for a kite or a kite accessory, should you apply for a patent, trademark, copyright, none of these, or all of them?

A patent protects the basic idea embodied in the new creation, a trademark protects the name of the product, and a copyright protects the words and style used in presenting the idea.

A patent is issued when a proposed idea is new, novel, and not obvious to someone familiar with kiting. It is good for 20 years and is not renewable. About 65 per cent of patent applications are approved and the inventor may assign the patent, sell it, or grant rights on a royalty basis. Cost to obtain a patent is $3,000 to $5,000, including searching and filing fees. After the issuance of a patent, a yearly maintenance fee is charged to keep the patent current. The fee varies with the subject and use of the patent, but for most kite patents would total $2,875 for the life of the patent. Just another way to increase revenue for the Patent Office.

There is still another way of protecting a specific shape, design, or coloration of a product, as opposed to function. This is done by means of a "design patent." These patents are rather quick and easy to obtain and are renewable after the original 14-year life. Few design patents are filed, however, because they are easy to get around by changing one or more of the design elements. The cost varies from $185 to $370.

A trademark can be obtained on a word or words, names, symbols, services, or devices which are used to describe or identify a product or idea, providing the same word or words aren't already registered for a product or idea in the same or similar field. For example, "zephyr" is a word trademarked for several different types of products, but if it isn't registered as a kite name, it can be trademarked for this particular use. A trademark is good for as long