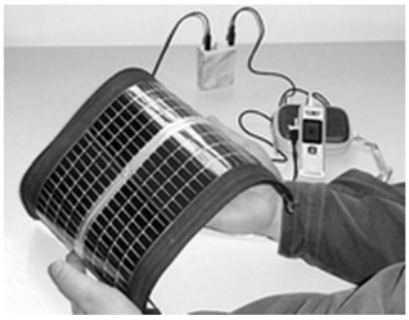
FLEXIBLE FABRIC SUPERCAPACITOR

Vladyslav Yaroshchuk

Educational and Research Institute of Energy Saving and Energy Management,
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

Scientists of the Lviv Polytechnic invented a new way to benefit from the energy of the Sun. The invention runs on a solar battery and can even charge a mobile phone.

Professor of the Physics Department of the Lviv Polytechnic Hryhoriy Ilchuk, Professor of the Department of Organic Chemistry Viktor Tokarev, chief technologist of the projects of Atser LLC Ihor Chernilevsky and a team of young scientists of the university developed a "flexible fabric supercapacitor".



A flexible supercapacitor is a home appliance power system consisting of a solar battery, a supercapacitor that increases the efficiency of the solar battery, and an electronic manager that distributes the generated energy in the most optimal way (Sundriyal & Bhattacharya, 2020).

How does the device work? The invention is an autonomous power supply system for household appliances. The principle of its operation is that the solar cell generates an electrical signal, which subsequently enters a supercapacitor with a very large capacity. It accumulates energy, and then optimally distributes it with the help of a special electronic manager. The flexible part, where solar energy is converted into electricity, has already been developed in the world. And Lviv scientists needed to create a flexible supercapacitor, which would allow the implementation of an autonomous system.

The first embodiment of the technology is a bag in which you can charge only a mobile phone because its power is only 2 Watts. But the Ukrainians claim that this is not the limit and that it is possible to create more powerful systems to charge a tablet or laptop. They have been working on this project for the past three years and say that there could be many modifications to the autonomous power supply. If you increase the power of the installation, you can supply energy to the whole house! In addition, the system works even in diffused sunlight.

The amazing device of Lviv polytechnics opens up other interesting perspectives. For example, the surface of tourist tents can be a permanent accumulator of solar energy and provide an opportunity to heat the tent or cook food on electrical appliances without lighting a fire.

In addition, the residents of Lviv have already invented a system of autonomous lighting of apartments based on supercapacitors, which, according to them, will provide significant cost savings and pay for itself in one and a half years.

In 2011, the flexible supercapacitor was included in the list of the best world developments according to the version of the American scientific magazine Research & Development.

Reference:

Sundriyal, P., & Bhattacharya, S. (2020). Textile-based supercapacitors for flexible and wearable electronic applications. *Scientific Reports, 10*. Retrieved from https://www.nature.com/articles/s41598-020-70182-z