Fashion ACs

Tomorrow's Technology

Article

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Global warming is a major concern in the post-industrial era, with widespread climate changes impacting the ecosystem, wildlife and human beings. The global mean surface temperature rose steeply by 0.87°C in 2006–15 vis-à-vis 1850–1900. Many factors are contributing to the increasing temperature, such as rapid industrialization, modernization, urbanization, and growing use of machines and home appliances that emit pollutants, including chlorofluorocarbons (CFCs).

The usage of centralized cooling systems has increased in tandem with the rise in temperatures globally. This is further contributing to global warming, creating a vicious cycle. To address the situation, efforts are on for developing disrupting technologies centered on individual cooling. The latest attempt in this direction is by Sony, which recently announced a wearable air conditioner (AC), Reon Pocket, as a crowdfunded project on the company's crowdfunding platform, First Flight.

Source: Sony

Reon Pocket is a compact temperature control device working on the Peltier effect, named after French physicist Jean Charles Athanase Peltier, who discovered it in 1834. When an electric current flows through a junction of two different conductors, energy is transferred from one conductor to another, which causes one side to heat up and the other to cool down. This phenomenon is known as the Peltier effect. Thus, devices based on the Peltier effect neither require any moving parts such as a compressor or solution pumps nor any condenser, expansion valve, or absorber; therefore, they are simple to design and easy to construct. Other advantages of the technology include low power consumption, small size and light weight. Peltier effect-based components are generally used in car and wine coolers as they consume less power even if used for long periods.

Reon Pocket comes with a dedicated innerwear. The innerwear has a pocket or a holder between the shoulder blades, below the wearer's neck where the device is placed. Temperature can be adjusted via an Android or iOS mobile application. It is ideal for hot summer outings as well as cold winter excursions. It can cool the body by about 13°C in hot climates or raise the body temperature by 8°C in winters.

Specifications of the device:

Reon Pocket	Innerwear
▪ Dimensions: 54 mm x 20 mm x 116 mm ▪ Weight: 85 gm ▪ Connectivity: Bluetooth 5.0 low energy ▪ Operating systems: iOS 13 and Android 8 ▪ Charging port: USB Type-C™ ▪ Battery: Lithium-ion ▪ Charging time: 2 hours ▪ Battery life: 90 minutes ▪ Availability: Japan only ▪ Variants: • Reon Pocket Standard: Works with iOS/Android app and has an auto mode • Reon Pocket Lite: Works with manual controls only (cheaper version)	▪ Size: Small/Medium/Large ▪ Designed only for men ▪ Material: Special silicon

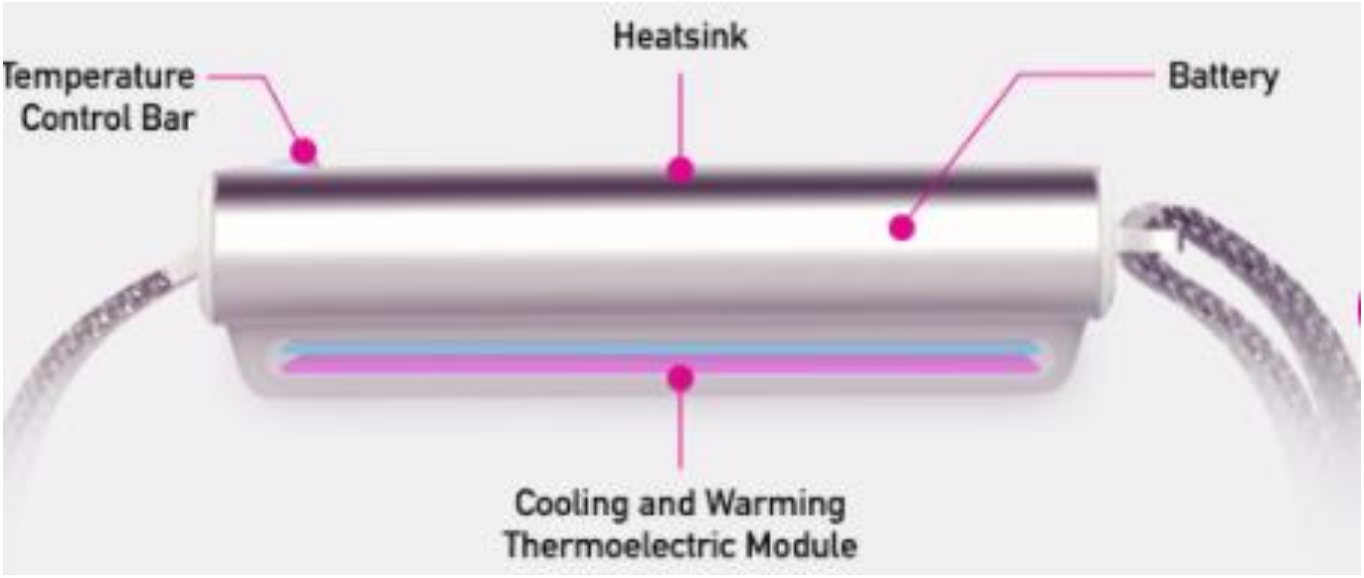
The wearable AC is not waterproof, but any dirt, sweat or water droplets that stick to it can be wiped off with a hygroscopic soft cloth. The device has high utility and is expected to consume less energy, which renders it environment-friendly.

Sony Reon Pocket is priced at USD 132 for one device and one innerwear, and USD 178 for one device and five innerwears. It is expected to be commercially available in 2020.

Since the announcement on July 25, 2019, the device has generated a huge buzz on social media and surpassed its crowdfunding target of USD 621,126. Currently, the company does not seem to have a patent for this product, but may be in the process of getting one. Sony clearly wants to test the demand for this product in the target market; accordingly, it will strategize availability globally.

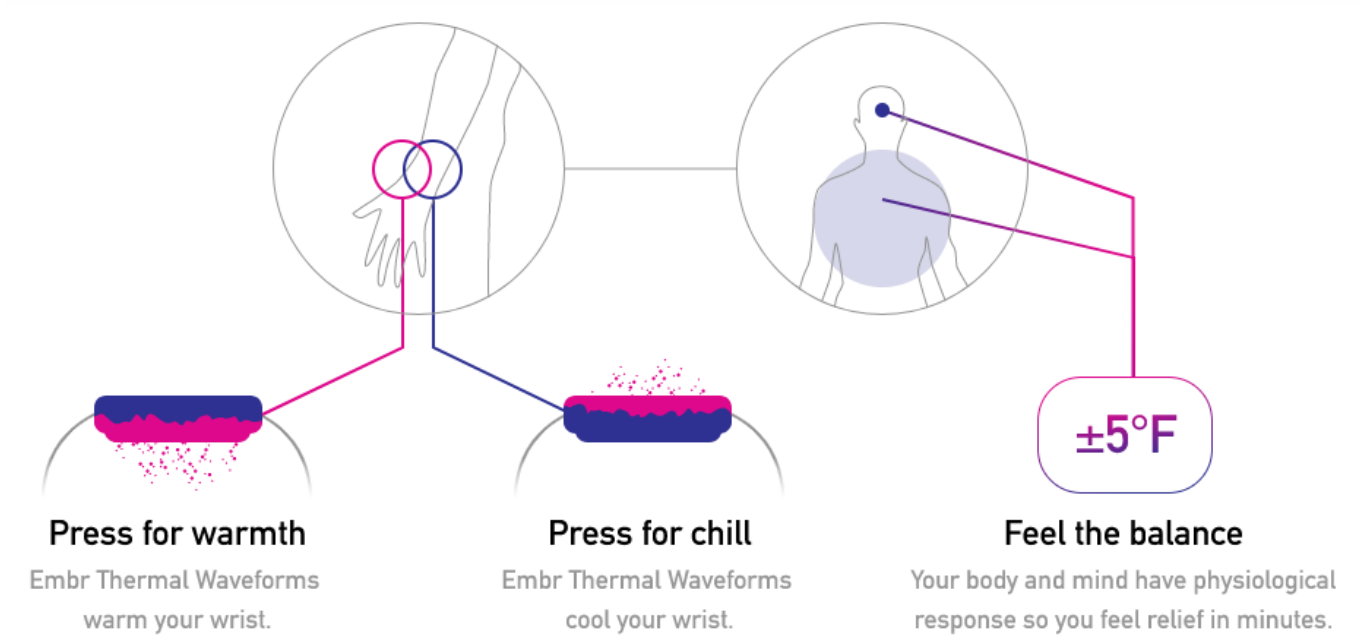
This is not a first-of-its-kind invention. In 2013, a group of engineers from MIT invented a heating/cooling wristband Wristify, introduced in February 2018 as Embr Wave. It was also started as a successful crowdfunding project on Kickstarter.

Embr Wave, like Reon Pocket, works on the Peltier effect. The device comprises solid-state thermos-electric heating/cooling module, temperature sensors, lithium battery and heatsink.



Source: Embr Labs

Based on the patented Embr Thermal Waveforms technology, the device provides optimum thermal regulation to the user while commuting, post-workout or in hot public spaces. The technology works on the physiological science of cooling or warming the temperature-sensitive skin on the wrist in short algorithmic waves of temperature fluctuations, instead of a continuous stream of heating or cooling. This activates parts of the body and brain that control thermoregulation and pleasure, creating a natural response that makes the user feel colder or warmer overall within a few minutes.



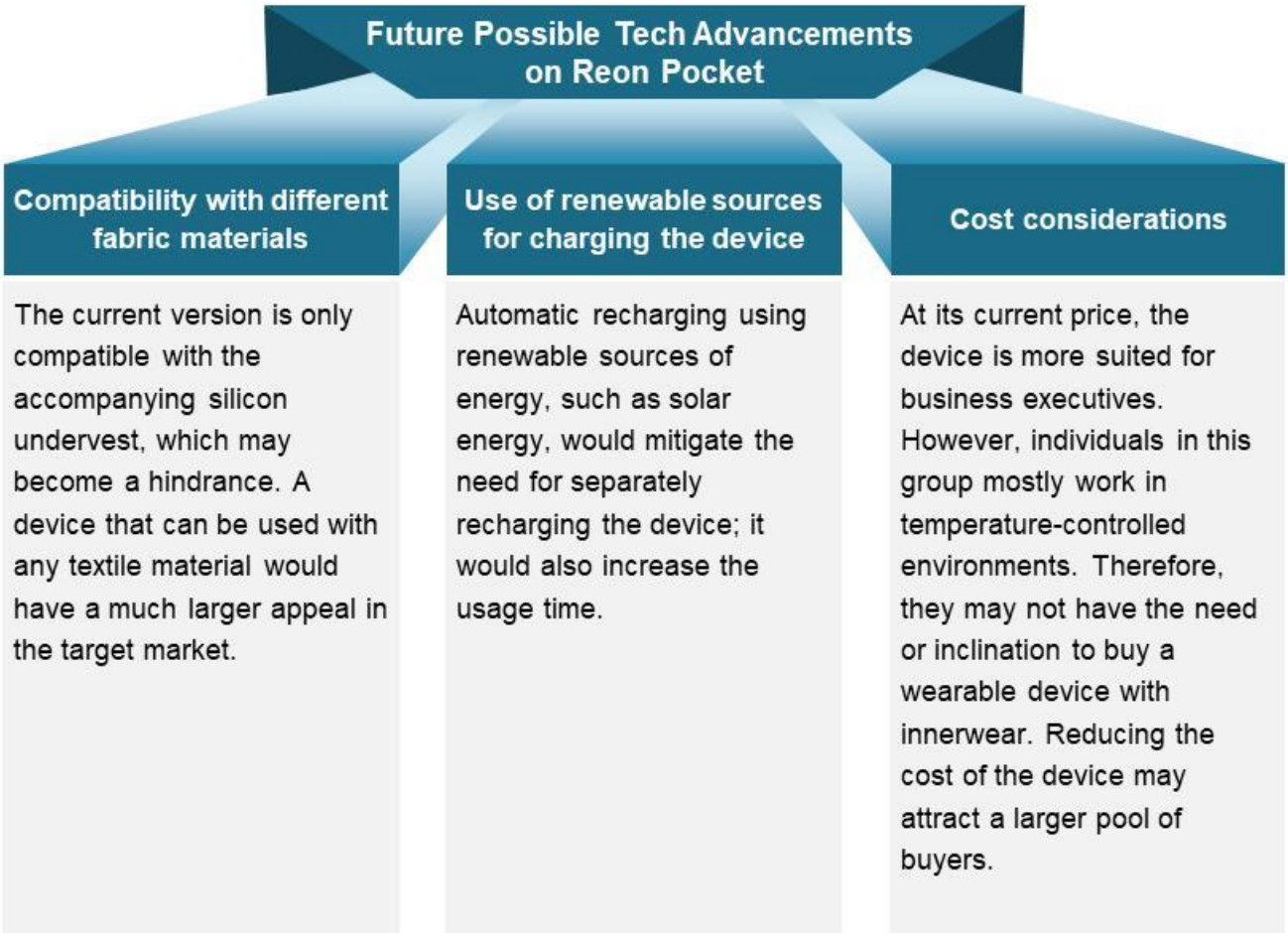
Source: Embr Labs

Several other portable cooling devices are available in the market, based on different technologies. A few examples are:

- Arctic Air: A small portable air cooling fan with dimensions 17 cm x 16 cm x 14.5 cm and weight 0.7 kg
- Vortec Personal Air Conditioners (PAC): Has two components:
  - A cooling tube with belt that generates cold air
  - A diffuse cooling vest that dispenses the cold air to cool the user's torso

- The US Army is developing a Lightweight Environmental Control System that would be embedded inside army vests.
- Multiple videos of DIY personal air coolers working on the Peltier effect are available on the internet.

Given the volume of research underway in this field, and the initial hype and interest in Reno Pocket, Sony's success or failure with this product will have a large bearing on future wearable ACs. Although the current specifications of Reno Pocket seem very promising, there is a lot of scope for brainstorming on various aspects as shown in the figure below.



Sony's product has opened up new avenues that could be explored from a technological standpoint. Its practical implementation may bring various challenges to the forefront. Overcoming these would be the key to creating a sustainable and environment-friendly solution.

Crowdfunding by Big Brands

Sony launched its crowdfunding platform, First Flight, in June 2015. This was a part of the company's effort to reinvent itself and get the public to test its product. First Flight is dedicated to the company's in-house projects and enables it to accurately estimate the potential of its ideas. The platform also functions as an online retail store for projects and innovations that are successful. Over the years, Sony has announced multiple products using crowdfunding, such as Wena Wrist smartwatch, FES Watch U e-ink timepiece, and Qrio smart lock. It is interesting to note that in its first attempt at crowdfunding, before the launch of Frist Flight, Sony refrained from associating its brand name with the product—the company wanted an honest response where people were not influenced by its name.

Other big brands too have experimented with crowdfunding for several reasons, excluding raising capital.

When do big brands go for crowdfunding?

When they want to:

- Launch a new product in a new category or business line
- Develop new brands or innovating and revitalizing existing brands
- Understand consumer/market requirements and expectations without making assumptions

How does crowdfunding help them?

It helps in:

- Testing new ideas and products with consumers directly, and on a small, less costly scale.
- Estimating the market value of the launched product or business line and getting real-time market feedback and validation
- Building one-to-one connections with consumers

Which noteworthy brands have embraced crowdfunding?

- FirstBuild, a General Electric subsidiary, raised approximately USD 2.8 million in 2015 to launch the Opal Nugget Ice Maker.
- Clorox's Soy Vay brand partnered with a start-up, Three Jerks Jerky, and launched a Kickstarter for Veri Veri Teriyaki.
- Queen Games, an established table top games publisher, used the crowd-sourcing platform, Kickstarter, to promote its game Alhambra.
- Pebble, a smartwatch manufacturer, attempted to raise USD 100,000 in 2013 and ended up raising USD 10,266,844 to bring the project to life.

A note of caution: big brands need to be careful and highly selective in understanding when and how to adopt crowdfunding. They should choose experimental products and test partnerships, rather than products that they plan to launch and promote on a large scale anyway, as this will negatively impact the way consumers view crowdfunding platforms.

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