'Fiberizer' Research Eliminates Post-Production Textile Waste. By Kathlyn Swantko

Recycling Machine

The textile recycling industry recycles approximately 3.8 billion pounds of post-consumer textile waste (PCTW) each year, which accounts for only 15 percent of all PCTW, according to the Council for Textile Recycling. This means that 85 percent of all textile waste goes into our landfills. It's obvious that much more needs to be done.

Cornell University is doing its part to address this problem through development of its "Fiberizer" machine. The "Fiberizer" research began in 2013 with funding obtained from the EPA. To build a more robust and industry-ready version of the "Fiberizer," Cornell also received funding from the Walmart Foundation as part of its U.S. Manufacturing Innovation Fund.

"Since being contacted by a few U.S. firms about the need for a recycling machine to use in their factories and showrooms, we realized that there could be value in supporting domestic manufacturing through this project," explains Anil Netravali, leader of the "Fiberizer" research and a professor in fiber science & apparel design at Cornell.

For More Information:

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"Our first partner was Eileen Fisher's closed-loop, take-back program, known as 'Fisher Found', which gives Eileen Fisher clothes new life beyond their first use," explains Netravali. The partnership gave the 'Fiberizer' team insight and access to Fisher's recycling facility and factory in Irvington, New York.

Since Cornell's association with Eileen Fisher, more apparel brands have expressed interest in the "Fiberizer" as a way to deal with excess inventory.

"One company had damaged products from a fire that they didn't want to send to a landfill, and another brand wanted to fiberize development samples they could not throw away, due to intellectual property issues," notes Tasha Lewis, assistant professor of fiber science and apparel design in Cornell's College of Human Ecology. "Yet another company, primarily making T-shirts, wanted to fiberize their production scraps."

How the "Fiberizer" Machine Works

The "Fiberizer" machine takes into consideration what a particular textile is made of and the value of the fiber content and how it is constructed, such as knit or woven material.

The machine has three distinct sections: 1) the "fabric feed section, which consists of several rollers that grip and feed the fabric at a predetermined rate, depending on the fabric construction (woven, knitted, etc.), fabric weight (light, heavy, etc.), and the type of fibers used (PET, cotton, wool, etc.); 2) the fiberizing section, which consists of two sets of rotating blades, one rotating slow to match the fabric released from the feed section, and a second set of blades rotating at a much higher speed to separate the fibers and yarns from the fabrics by mechanical action, while the fabric is being held by the feed rolls; and 3) the collection space.

The "Fiberizer" is simple to operate; there are no specific procedures involved in operating it. The second section has been designed for interchangeable cartridges having different sets of blades, depending on the fabric weight or the fiber/fabric being fiberized.

Currently, the Cornell "Fiberizer" team is refining the operation of the machine, and is working on Version-3. The goal for this version is make the "Fiberizer" versatile enough that any type of fabric/fiber or fabric weight can be easily fiberized. Both Version-2 and Version-3 are tabletop models. The plans for Version-3 is to employ two motors to drive the two sets of blades individually, at a desired speed. If there is enough demand for the machine, the team would like to develop a slightly larger version that can fiberize several kgs/hr.

"The "Fiberizer" team: Undergrad student Emilie Camera, Prof. Anil Netravali, Prof. Tasha Lewis, and grad student Schuyler Duffy standing next to the Fiberizer V2.

"The "Fiberizer" should be useful for small and medium scale manufacturers that want to fiberize their scrap fabric pieces," explains Netravali. "Since the fiberized material can be used in a variety of applications (i.e. insulation, filling for stuffed animals, animal bedding, futons, composites, etc.), the manufacturers should be able to sell that material, rather than putting it in landfills. ●

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