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RETHINK III: Bio-Shoes in Urban Campus Life

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Keywords: bio-shoes, cellulosic fiber, sustainability, zero waste design

Design Purpose:

Shoes made of eco-friendly or recycled/reused materials have gradually emerged in the phenomenon of today's footwear industry with the public attention to sustainable fashion (Grahame, 2014). Inspired by the concept of "sustainability" and based on our previous shoe design made of a green tea-based biodegradable cellulose fiber mat for outer shell, layered with synthetic leather for inner shell and polyurethane for outsole (Nam & Lee, 2016), we further challenged to implement McDonough and Braungart's (2002) cradle-to-cradle design approach into the sustainable shoe design process. For designing and developing our bio-shoes, we specially focused on sustainable material selection for each different layer of the shoe structure and simple pattern development using a zero waste design approach, which may lead to reduce negative environmental impact. In addition, our bio-shoes considered much attention to wearers' functional and aesthetic desires since these shoes are even closed to using eco-friendly materials and are a human's prime point of contact with nature. We chose a contemporary look for the bio-shoe design, inspired by the "loafer style," lace-less shoes, which can complement current college male students' desires and needs of shoes in their urban campus life.

Design Process and Techniques:

The bio-shoe design and development involved multiple steps: design ideation, cellulose fiber mat development for the upper shell, material selection for other parts (e.g., middle shell, inner shell, outsole), and assembly. Once design sketches were finalized, simple shoe patterns were developed and refined by reusing packaging papers and worn out jeans. Second, a green tea-based cellulose fiber mat, the main shell material of the shoes, was grown and made by the designers. To enhance aesthetic appealing of the bio-shoes and have intention for attracting eco-conscious young male consumers to wear the bio-shoes in their urban campus life, the cellulose fiber mats were naturally dyed with leftover coffee grounds in order to replicate the color of Van Dyke brown. Our bio-shoes were structured with two main parts: shell and outsole. In terms of material selection, three different eco-friendly layer configurations were featured of the entire shell: cellulose fiber mat for upper shell, denim for middle shell, and hemp for inner shell. The outsole was made of natural cork, designed to fit the upper shell, and to provide comfort of the wearer. The flat shape was chosen for the outsole, which can appropriately support human feet and body without high pressure.

Materials:

The green tea-based cellulose fiber mats, upper shell material of the shoes, were grown by designers using the following combination of ingredients in a 11.5" × 16.75" plastic container at

a room temperature of -85°F: 3760ml water, 9 organic green tea bags, 540g cane sugar, 632ml vinegar, and 100g commercial organic SCOBY (Symbiotic Colony of Bacteria and Yeast). Three sheets of the material were used to make the upper shells of this bio-shoe design. Other materials used to complete this design were denim, hemp, compressed paper, cork, rubber band, glue, and polyester sewing thread.

Date Completed: August 07, 2016

Shoes Measurements (length × width × height): 12.6" × 4.5" × 4.1"; U.S. man's shoe size of 10

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Image A. Front View



Image B. Back View



Image C. Different Angle



Image D. Interesting Design