“Exploring the capabilities of this frequently used yet underestimated organ”

Cheng Guo demonstrating the chewing drill. (DTI/Photos courtesy of Grey Chen and James Champion)

Blowing rotomoulding machine.

Mouth Factory is a unique artistic project that explores the capabilities and versatility of the oral cavity through a series of functional machines designed to be operated by the user using his or her mouth. The tools were created by Cheng Guo, a young Chinese designer and artist, who studied industrial design at Tongji University in Shanghai and recently obtained a Master of Arts degree in Product Design at the Royal College of Art in London. DT Editor Claudia Duschek had the opportunity to speak with Cheng about his exceptional creations, which have already been exhibited in London and Milan.

Claudia Duschek: How did you come up with the idea of tools that can be controlled with the mouth?

Cheng Guo: The reason I chose the mouth as the subject matter is that, although it is such a wondrous organ, its versatility is usually overlooked owing to familiarity with our own body. Apart from linguistic communication, food mastication and respiratory function, which we take for granted in everyday life, the human mouth is capable of many other functional tasks. Using my oral apparatus, I sought to explore the capabilities of the mouth.

Blowing rotomoulding machine.

What is the main purpose of your tools?
The project was started with the aim of enhancing and expanding oral capabilities by harnessing various functional devices. By exploring the capabilities of this frequently used yet underestimated organ, I selected some common movements as they are performed in daily function and designed five tools. Each of them uses the mouth in an extraordinary way: a chewing drill, teeth lathe, tongue extruder, blowing rotomoulding machine and vacuum form machine.

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As you can see, my collection of tools is neither particularly functional nor very efficient. I regard them primarily as performative devices. Through operating the tools, I’d like people to reflect about the reciprocal relationship between them and objects in their surroundings and other ways in which they could use these.

Would you please explain briefly how the Mouth Factory tools work?
The bite force of a human mouth is about 15 to 55 kg. The chewing drill, for example, uses a set of rack gears to transfer this force into torque. The chuck can hold various bits such as drill bits, screwdriver bits, sander bits and milling cutters.

Another of my tools, the teeth lathe, I invented, that are operated by the user’s hand. Two one-way bearings hidden in the putty wheel on each side allow the axle to rotate in a single direction only. Instead of using the lower front teeth as the cutter, which was the initial idea, the user grips a silver steel blade with his or her teeth to shape the rotating material.

I obtained the shape of the tongue extruder from a cast of my oral cavity. The silver material from which the extruder is made is safe for use in the mouth. After placing the chewing gum or modelling clay into the extruder, the user pushes the material through the die using his or her tongue to complete the extrusion process.

Did you consult a dentist on the design or possible risks of using the tools?
Yes, I interviewed several experts like musicians and glass blowers, as well as several dental surgeons. In addition to obtaining advice about avoiding damage while operating these tools, I tried to learn more about taking advantage of physiological defects or diseases, translating them to functional usage. An example is the teeth lathe derived from my observation and study of malocclusion. More specifically, Angle’s Class III malocclusion gave me a lot of inspiration and my initial idea was to use the lower incisor to substitute the blade.

Moreover, I sought to investigate the impact of using these oral machines for a long period on the human body. According to a dentist I interviewed, chronic mouth breathing may have some negative effects, including increased vertical facial length, from which it can be deduced that the long-time utilisation of these oral devices may have similar consequences.

Did you use any special computer software to develop these tools?
I always start out by imagining it in 3D first, in my head. After drawing a rough sketch, I create the 2-D spec sheet on the computer. Then, I take the design to the metal workshop to assemble the parts. I use basic hardware such as a lathe, milling machine and wire saw. My design for Mouth Factory improved as I became more familiar with using the machinery in the process.

Thank you very much for this interview.